



GEORGIA
DEPARTMENT OF NATURAL RESOURCES

ENVIRONMENTAL PROTECTION DIVISION

**QUALITY ASSURANCE
PROJECT PLAN FOR
GEORGIA'S EMISSION
INVENTORIES**

Prepared by:
Planning and Support Program
Air Protection Branch
Environmental Protection Division

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OVERVIEW

EPA provides multiple documents to assist Quality Assurance Project Plan development. This project will utilize existing data sources to compile emissions inventories of all sources: stationary point, stationary non-point, fires, on-road mobile, and non-road mobile. This QAPP will address all elements required by “QAPP Requirements for Secondary Data Research Projects” (EPA, 1999).

Although many of the required QAPP elements do not apply to this project, this document is organized using the format specified in the U.S. Environmental Protection Agency’s (EPA) overall QAPP guidance documents – “EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5” (EPA, 2001), and “EPA Guidance for Quality Assurance Project Plans, EPA QA/G-5” (EPA, 2002). If Georgia EPD has determined that a QAPP element does not apply to this project, the section heading is followed by the statement “This element is not applicable to this project.”

1.0 PROJECT MANAGEMENT

1.1 Title and Approval Page (EPA QA/R-5 A1)

See pages 1 and 2.

1.2 Table of Contents (EPA QA/R-5 A2)

See page 3.

1.3 Distribution List (EPA QA/R-5 A3)

Name: Karen Hays, P.E.

Title: Branch Chief

Organization: Air Protection Branch, Georgia Department of Natural Resources

Address: 4244 International Pkwy, Suite 120, Atlanta, GA 30354

Phone/E-mail: (404) 363-7016; Karen.Hays@dnr.ga.gov

Name: James Boylan, Ph.D.

Title: Planning and Support Program Manager

Organization: Air Protection Branch, Georgia Department of Natural Resources

Address: 4244 International Pkwy, Suite 120, Atlanta, GA 30354

Phone/E-mail: (404) 363-7014; James.Boylan@dnr.ga.gov

Name: Di Tian, Ph.D.

Title: Data and Modeling Unit Manager

Organization: Air Protection Branch, Georgia Department of Natural Resources

Address: 4244 International Pkwy, Suite 120, Atlanta, GA 30354

Phone/E-mail: (404) 362-4851; Di.Tian@dnr.ga.gov

Name: Deborah Basnight
Title: Emissions and Control Strategies Unit Manager
Organization: Air Protection Branch, Georgia Department of Natural Resources
Address: 4244 International Pkwy, Suite 120, Atlanta, GA 30354
Phone/E-mail: (404) 363-7134; Deborah.Basnight@dnr.ga.gov

Name: Byeong-Uk Kim, Ph.D.
Title: Environmental Modeler
Organization: Air Protection Branch, Georgia Department of Natural Resources
Address: 4244 International Pkwy, Suite 120, Atlanta, GA 30354
Phone/E-mail: (404) 362-2526; Byeong.Kim@dnr.state.ga.us

Name: Tao Zeng, Ph.D.
Title: Environmental Modeler
Organization: Air Protection Branch, Georgia Department of Natural Resources
Address: 4244 International Pkwy, Suite 120, Atlanta, GA 30354
Phone/E-mail: (404) 363-7092; Tao.Zeng@dnr.ga.gov

Name: Stacy Allman
Title: Environmental Compliance Specialist
Organization: Air Protection Branch, Georgia Department of Natural Resources
Address: 4244 International Pkwy, Suite 120, Atlanta, GA 30354
Phone/E-mail: (404) 363-7033; Stacy.Allman@dnr.ga.gov

Name: Gil Grodzinsky, Ph.D.
Title: Environmental Modeler
Organization: Air Protection Branch, Georgia Department of Natural Resources
Address: 4244 International Pkwy, Suite 120, Atlanta, GA 30354
Phone/E-mail: (404) 363-7123; Gil.Grodzinsky@dnr.ga.gov

Name: Jing Wang
Title: Environmental Engineer
Organization: Air Protection Branch, Georgia Department of Natural Resources
Address: 4244 International Pkwy, Suite 120, Atlanta, GA 30354
Phone/E-mail: (404) 363-7137; Jing.Wang@dnr.ga.gov

Name: Richard McDonald, P.E.
Title: Environmental Engineer
Organization: Air Protection Branch, Georgia Department of Natural Resources
Address: 4244 International Pkwy, Suite 120, Atlanta, GA 30354
Phone/E-mail: (404) 362-6594; Richard.McDonald@dnr.ga.gov

1.4 Project Organization (EPA QA/R-5 A4)

Figure 1-1 identifies the individuals participating in the project. Their specific roles and responsibilities are described below.

- Overall QAPP Manager – Karen Hays (Chief, Air Protection Branch) will supervise the overall organizational and managerial aspects of the project.
- QAPP Manager – James Boylan (Manager, Planning and Support Program) will oversee and review all work products submitted by the Project Manager(s). Also, he will oversee the statutory requirements of this project.
- Project Managers – Deborah Basnight (Manager, Emissions and Control Strategies Unit) and Di Tian (Manager, Data and Modeling Unit) will oversee and monitor technical activities performed by the project Task Leaders.
- Task Leaders, Stationary Point Sources – Stacy Allman and Jing Wang will be responsible for the collection, preparation, and submittal of the Stationary Point source inventory, which includes online data collection and implementation of QA/QC procedures prior to submittal to the NEI database. These QA/QC procedures will be described in detail in Section 1.6 of this document.
- Task Leaders, Non-Point Stationary Sources – Byeong-Uk Kim and Richard McDonald will be responsible for the preparation and submission of the non-point stationary sources inventory. They will identify and implement effective QA/QC procedures for the non-point stationary sources inventory. These QA/QC procedures will be described in detail in Section 1.6 of this document.
- Task Leader, Fire Sources – Tao Zeng will be responsible for the preparation and submission of the fire (wildfires, prescribed burning, agriculture burning, and land clearing) source inventories. He will identify and implement effective QA/QC procedures for the fire source inventories. These QA/QC procedures will be described in detail in Section 1.6 of this document.
- Task Leader, On-Road Mobile Sources – Gil Grodzinsky will be responsible for the preparation and submission of the on-road mobile source inventories. He will identify and implement effective QA/QC procedures for the on-road mobile source inventories. These QA/QC procedures will be described in detail in Section 1.6 of this document.
- Task Leader, Non-Road Mobile Equipment, Engine, and Vehicle Sources – Gil Grodzinsky will be responsible for the preparation and submission of the non-road mobile equipment, engine, and vehicle source inventories. He will identify and implement effective QA/QC procedures for the non-road mobile source inventories. These QA/QC procedures will be described in detail in Section 1.6 of this document.
- Task Leader, Other Non-Road Mobile Sources – Richard McDonald will be responsible for the preparation and submission of the commercial marine, aircraft (except Hartsfield-Jackson Atlanta International Airport), and railroad source inventories. Gil Grodzinsky will be responsible for preparation and submission of Hartsfield-Jackson Atlanta International Airport emission inventories. They will identify and implement effective QA/QC procedures for the commercial marine, aircraft, and railroad source inventories. These QA/QC procedures will be described in detail in Section 1.6 of this document.

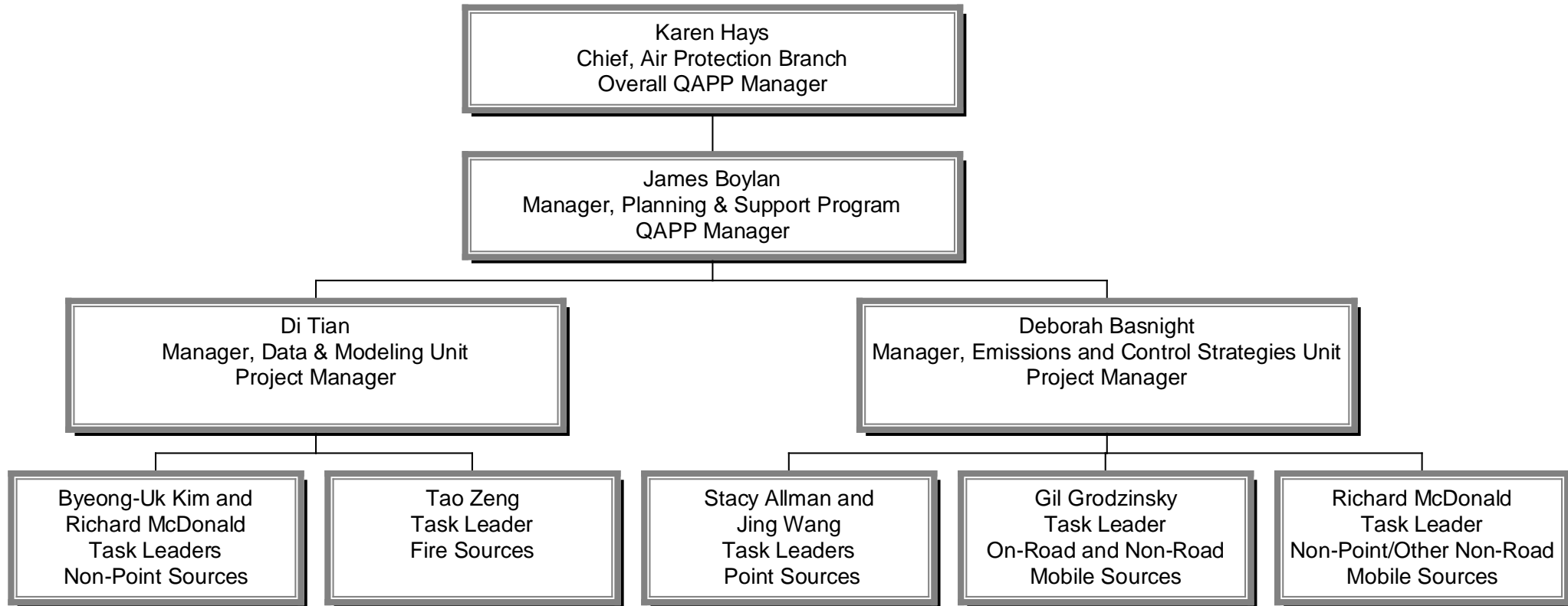


Figure 1-1. Project Organization Chart

1.5 Problem Definition/Background (EPA QA/R-5 A5)

The Clean Air Act of 1970 and the associated Amendments of 1990 provide statutory requirements for improving air quality in the United States. Quantification of air quality necessitates the gathering, storage, retrieval and analysis of air pollution data. These data, stored in the computer-based National Emission Inventory (NEI) database system, provide information essential to inquiry, investigation, and decision-making. For example, analysis of the data may lead to a more thorough consideration of certain industries or certain emissions sources, provide the basis for the development or evaluation of control strategies, and serve as the basis for an evaluation of the effectiveness of regulations.

An emissions inventory is a compilation of all sources of air pollutant emissions, complete with the emissions from these sources, in a given area. Emission inventories are the fundamental building blocks used to develop air quality control strategies and attainment strategies on a local, state, regional, and national level. In 2015, EPA promulgated the Air Emissions Reporting Requirements (AERR) Rule (80 FR 8787, February 19, 2015) to collect emission data from states. The AERR requires the state of Georgia to submit annual emission inventories for all source sectors every three years and large stationary point sources every year. The pollutants that are required to be included in the emissions inventory are nitrogen oxides (NO_x), sulfur dioxide (SO₂), ammonia (NH₃), lead (Pb), carbon monoxide (CO), volatile organic compounds (VOCs), and particulate matter (PM_{2.5} and PM₁₀ must include both filterable and condensable emissions).

The State of Georgia, through the Air Protection Branch, collects data pertaining to the emissions of air pollutants and reports these data in turn to the Environmental Protection Agency. In the Georgia Air Pollution Branch (APB), the Emissions and Control Strategies Unit (ECSU) is responsible for emissions inventory submittals, with assistance from the Data and Modeling Unit (DMU). This QAPP (Quality Assurance Project Plan) describes the QA/QC procedures related to Georgia's emission inventories for all sources (point, non-point, on-road mobile, non-road mobile, and fires). Data are provided to EPA's NEI database using EPA's Exchange Network Emission Inventory System (EIS) dataflow.

Applications for the use of emissions inventory data are numerous. In addition to use as a building block in developing air quality control strategies and attainment strategies, other specific uses of this data include:

- State and national rulemaking
- State oversight of point sources
- Public requests and websites
- Use in EPA's National Annual Trends Report
- Use in EPA's National Air Toxics Assessment (NATA)
- Documentation of regulatory impact assessments
- Permit modeling
- Air quality assessments & SIP modeling
- Air quality planning
- Designation recommendations

1.6 Project/Task Description and Schedule (EPA QA/R-5 A6)

The objective of this project is to estimate county-level or point-level emission inventories for all emission sources in the state of Georgia. The inventory will be developed consistent with EPA's criteria for emission reporting. The QAPP addresses the following tasks: data collection and compilation from the various sources, inventory review, revisions and corrections, documentation, and data submittal.

Stationary Point Sources

The APB collects facility point source emission inventory data required by EPA's AERR via an online electronic reporting process, the Georgia Environmental Connections Online (GECO) system. For each year, the actual emissions submitted through the GECO system will be reviewed by EPD and submitted to the EPA exchange network service center.

1. The facility potential to emit (PTE) emissions are compared with the emission threshold for NEI and non-NEI years defined in the AERR to determine if the actual point source emissions data submittal will be required annually or every 3 years.
2. The ECSU ensures that the GECO Emissions Inventory (EI) online application website is updated to receive data with EPD_IT assistance. The ECSU generates EI mail-out lists to the reporting facilities, based on the requirements for the reporting year.
3. Affected Facilities submit emissions data through the GECO online application by June 30 each year.
4. Perform quality assurance of EI data via EPD internal QA/QC procedures.
5. Convert Staging Table formatted draft inventory data into XML format with EPA's Bridge Tool.
6. Submit XML format data to EIS QA Environment; repeat any necessary step from Task 4 to Task 6 until QA Environment submission does not give any errors.
7. Submit XML format data to EIS Production Environment; fix errors that may occur, and resubmit data to Production Environment if needed.
8. Submittal of Final EI information to EPA by December 31.

Stationary Non-Point Sources

1. Download and review the Non-point Emissions Methodologies and Operator Instructions (NEMOs) and associated inputs for relevant tools.
2. Download and review non-point stationary source emissions and throughput/activity data used to estimate non-point stationary source emissions from EPA's draft NEI for the applicable year. This task also includes acquiring and utilizing available emission estimate tools (e.g., residential wood combustion tool).
3. Download and review other available inventories (e.g., SESARM inventories) for categories not covered by EPA's draft NEI.
4. Review the EPA's cross-walk table for point/non-point Source Classification Code (SCC) pairs.
5. Merge inventories from Task 2, 3, and 4 above. This task includes converting XML format data into Staging Table format.
6. Review and conduct QA/QC on the merged inventory from Task 5. QA/QC will focus on detecting duplicate records, range checks, and comparing county level summaries between the current draft emission inventory and the previously submitted final NEI inventory.
7. Convert Staging Table formatted draft inventory data into XML format with EPA's Bridge Tool.
8. Submit XML format data to EIS QA Environment; repeat any necessary step from Task 1 to Task 7 until QA Environment submission does not give any errors.
9. Submit XML format data to EIS Production Environment; fix errors that may occur, and resubmit data to Production Environment if needed.

Wildfires

1. Collect wildfire records from Georgia Forestry Commission (GFC), military bases, and federal agencies.
2. Consolidate all these records by removing duplicates and convert them into consistent format.
3. QA/QC fire location information - obtain county information from Lat/Lon of each fire using ArcGIS; compare with county information in the GFC records; assign county centroid Lat/Lon to a fire if its Lat/Lon falls outside the corresponding county boundary.
4. QA/QC the start/end and date/time - calculate the length of burning and compare with the burning area; identify discrepancies and correct errors.
5. Compare burning records with historical records.
6. Update the emission factors by consulting with EPA's recent updates or recent literature.
7. Calculate emissions using the best available fuel consumption and emission factors in Microsoft Access.
8. Convert emissions estimates into Staging Table format.
9. Convert emissions estimates in Staging Table format into XML format with EPA's Bridge Tool.
10. Submit emissions estimates in XML format to EIS QA Environment; repeat any necessary steps from Task 1 to Task 9 until QA Environment submission does not give any error message.
11. Submit XML format data to EIS Production Environment; fix errors that occur, and resubmit data to Production Environment.

Prescribed Burning

1. Collect prescribed burning records from GFC, military bases, and federal agencies.
2. Consolidate all these records by removing duplicates and convert them into consistent format.
3. QA/QC fire location information – obtain county information from Lat/Lon of each fire using ArcGIS; compare with county information in the GFC records; and ask forest rangers at GFC to verify the Lat/Lon information for some prescribed fires when necessary.
4. QA/QC the start/end and date/time - calculate the length of burning and compare with the burning area; identify discrepancies and correct errors.
5. Compare burning records with historical records.
6. Update the emission factors by consulting with EPA's recent updates or recent literature.
7. Calculate emissions using the best available fuel consumption and emission factors in Microsoft Access.
8. Convert emissions estimates into Staging Table format.
9. Convert emissions estimates in Staging Table format into XML format with EPA's Bridge Tool.
10. Submit emissions estimates in XML format to EIS QA Environment; repeat any necessary steps from Task 1 to Task 9 until QA Environment submission does not give any error message.
11. Submit XML format data to EIS Production Environment; fix errors that occur, and resubmit data to Production Environment.

Agriculture Burning and Land Clearing

1. Review agriculture burning emissions developed by EPA.
2. Collect agriculture burning and land clearing records from GFC.
3. Compare burning records with historical records.
4. Update the emission factors by consulting with EPA's recent updates or recent literature.
5. Calculate emissions using the best available fuel consumption and emission factors in an Excel spreadsheet.
6. Convert emissions estimates from Excel into Staging Table format.
7. Convert emissions estimates in Staging Table format into XML format with EPA's Bridge Tool.

8. Submit emissions estimates in XML format to EIS QA Environment; repeat any necessary steps from Task 1 to Task 7 until QA Environment submission does not give any error message.
9. Submit XML format data to EIS Production Environment; fix errors that occur, and resubmit data to Production Environment.

On-Road Sources

1. Download the relevant MOVES default county-level database tables as a zip file for Georgia from EPA's EIS gateway either through:
 - a. <https://eis.epa.gov/eis-system-web/cdb/agency/list.html>, choose the most recent NEI with data, then click "Download Current Dataset". There will be a choice of on-road or non-road and this option allows updating from the last submittal
 - b. <https://eis.epa.gov/eis-system-web/cdb/state/list.html>, choose the most recent NEI with county database (CDB) data, then click "Download State CDB Data Set". There will be a choice of on-road or non-road and this option allows updating from EPA defaults if major changes are expected with the defaults or local data. EPA defaults consist of MOVES defaults updated with the newest EPA data available. Consult with EPA to determine which databases are purely MOVES defaults (did not require any updates) and make sure the defaults for Georgia are from the newest MOVES version in those cases.
2. Select on-road option, review these CSV files and update the following tables:
 - a. Avgspeddistribution: For counties covered by travel demand models (TDMs), compare TDM results and the EPA-developed speed distribution data based on telematics data, if available. For other counties, compare MOVES defaults and the EPA-developed speed distribution data based on telematics data, if available. Choose the option which is more representative for a county if more than one option is available.
 - b. HourVMTFraction: For counties covered by travel demand models (TDMs), compare TDM results and the EPA-developed hourly vehicle miles traveled (VMT) fractions based on telematics data, if available. For other counties, compare MOVES defaults and the EPA-developed hourly VMT fractions based on telematics data, if available. Choose the option which is more representative for a county if more than one option is available.
 - c. DayVMTFraction: Compare daily VMT fractions by day type provided by the Georgia Department of Transportation (GDOT) based on *Georgia Roadway Mileage and Characteristics Reports* (400 Reports) data series and the EPA-developed daily VMT fractions based on telematics data, if this EPA data is available. Choose the option which is more representative if more than one option is available for a county.
 - d. HPMSVtypeYear (annual VMT): Counties modeled by TDMs have annual VMT calculated from TDM output split into the required MOVES vehicle types using either GDOT HPMS data or EPA defaults depending on which data is available and/or more recent. For remaining counties, annual average VMT was compiled using data from GDOT's *Mileage By Route Type and Functional Classification Reports* (445 Reports) combined with GDOT HPMS data or EPA defaults to split into vehicle types.
 - e. IMcoverage: The original 13 county Atlanta non-attainment area for the 1-hour ozone NAAQS has an ongoing inspection and maintenance program (I/M) program. Every submission must include an "imcoverage" table based on the most recent local I/M data originally provided from the Georgia EPD Mobile & Area Sources Program's I/M Unit. For all other counties, the table is left blank.
 - f. MonthVMTFraction: For all counties in Georgia, GDOT provided, based on the Georgia Department of Transportation (GDOT)'s *Georgia Roadway Mileage and Characteristics Reports* (400 Reports) data series, a breakdown of VMT by month.

- g. RoadType (Ramp Fraction): Ramp fractions for counties covered by TDMs are calculated from TDM output. For other counties, MOVES defaults are used.
 - h. Roadtypedistribution: For counties covered by travel demand models (TDMs), compare TDM results and the EPA-developed road type distribution based on telematics data, if available. For other counties, compare road type distribution developed using GDOT's *Mileage By Route Type and Functional Classification Reports* (445 Reports) and the EPA-developed speed distribution data based on telematics data, if this EPA data is available. Choose the option which is more representative for a county.
 - i. Sourcetypeagedistribution (Age of Fleet)/SourceTypeYear (Vehicle Population): Age distribution data and vehicle population data have been developed for all counties from registration data purchased from IHS's National Vehicle Population Profile and IHS's TIPNet. Age distribution is not developed for individual counties in NEI, but for a group of counties with similar age distribution to provide enough data points to obtain a smooth distribution.
 - j. Startspcrday: Compare starts per day data provided by the Atlanta Regional Commission (ARC) using TDM output and MOVES defaults. Though the ARC starts per day data represent a typical weekday, they are also assumed representative for weekends. If the two datasets differ, choose the ARC data as EPA recommends using local data over MOVES defaults.
 - k. Fuelsupply: Review the default fuel data for years starting with 2017 developed by EPA to make sure that the impacts from the removal of boutique fuel (low RVP) requirements in 45 counties in Georgia have been properly taken into account. If not, replace the EPA default fuel data with conventional fuel for 32 counties and low summer federal RVP fuel for 13 counties in Atlanta.
 1. Zonemonthhour: Review the meteorology data provided by EPA for each county.
3. Export updated CDB data to EPA required formats.
 4. Submit updated CDB data to EIS QA Environment after successfully running EPA's QA Tool that checks all tables; repeat any necessary steps from Task 1 to 3 until QA Environment submission does not give any error.
 5. Submit updated CDB data to EIS Production Environment; fix errors that occur and resubmit data to the Production Environment.

Non-Road Mobile Equipment, Engine, and Vehicle Sources

Emissions from non-road mobile equipment, engine, and vehicle sources are calculated using the NONROAD model which is now part of MOVES.

1. Download the relevant MOVES default county-level database tables as a zip file for Georgia from EPA's EIS gateway either through:
 - a. <https://eis.epa.gov/eis-system-web/cdb/agency/list.html>, choose the most recent NEI with data, then click "Download Current Dataset". There will be a choice of on-road or non-road and this option allows updating from the last submittal
 - b. <https://eis.epa.gov/eis-system-web/cdb/state/list.html>, choose the most recent NEI with data, then click "Download State CDB Data Set". There will be a choice of on-road or non-road and this option allows updating from EPA defaults if major changes are expected with the defaults or local data. EPA defaults consist of MOVES defaults updated with the newest EPA data available. Consult with EPA to determine which databases are purely MOVES defaults (did not require any updates) and make sure the defaults for Georgia are from the newest MOVES version in those cases.
2. Select non-road option, review these MySQL or CSV files, and if necessary, update any of the 11

tables:

- a. Fuel formulation
 - b. Nrbaseyearquippollution
 - c. Nrdayallocation
 - d. Nrfuelsupply: Review the default fuel data for years after 2017 developed by EPA to make sure that the impacts from the removal of boutique fuel (low RVP) requirements in 45 counties in Georgia have been properly taken into account. If not, replace the EPA default fuel data with conventional fuel for 32 counties and low summer federal RVP fuel for 13 counties in Atlanta.
 - e. Nrgrowthindex: Review new information on growth trends such as fuel consumption, GDP, cargo, and airport service from sources such as the Energy Information Administration (EIA), Oak Ridge National Laboratory (ORNL) databook, and Bureau of Economic Statistics (BEA) and adjust where necessary.
 - f. Nrhourallocation
 - g. Nrmonthallocation
 - h. Nrretrofitfactors
 - i. Nrsourceusetype
 - j. Nrstatesurrogate
 - k. Zonemonthhour
3. Export updated CDB data to EPA required formats.
 4. Submit updated CDB data to EIS QA Environment after successfully running EPA's QA Tool that checks all tables; repeat any necessary steps from Task 1 to 3 until QA Environment submission does not give any error.
 5. Submit updated CDB data to EIS Production Environment; fix errors that occur and resubmit data to the Production Environment.

Other Non-road Mobile Sources

1. Download and review the emissions estimates for other non-road mobile sources (i.e. marine, aircraft, and railroad) from EPA's draft NEI for the applicable year.
2. Collect activity and emissions estimates for Hartsfield Jackson Atlanta International Airport (ATL) from City of Atlanta/Department of Aviation (DOA).
 - a. Compare activity and emissions estimates with EPA's draft NEI estimates.
 - b. Submit DOA activity and emission estimates if different than draft NEI estimates.
3. Collect locomotive activity data for rail yards to calculate emission reduction due to clean locomotives funded by the CMAQ locomotive grant.
4. Convert emissions estimates from Excel into Staging Table format.
5. Convert emissions estimates in Staging Table format into XML format with EPA's Bridge Tool.
6. Submit emissions estimates in XML format to EIS QA Environment; repeat any necessary steps from Task 1 to Task 5 until QA Environment submission does not give any error message.
7. Submit XML format data to EIS Production Environment; fix errors that occur, and resubmit data to Production Environment.

1.7 Quality Objectives and Criteria for Measurement Data (EPA QA/R-5 A7)

As noted in EPA's QAPP guidance, "when a study is to be based either entirely or in part on secondary data (data that was previously collected for a different intended use)...this section of the QA Project Plan is used to explain the criteria for determining which sources of data are sufficient to support the goals of the current project." (EPA, 2002 at page 19). Therefore, the following discussion presents the criteria that we will use to determine which data sources will be utilized to meet project objectives.

The main data quality objectives that Georgia APB will evaluate to ensure that data meet project objectives are:

- **Completeness** – As part of the emissions data review by Georgia APB, we will seek to determine whether the source provides complete data.
- **Representativeness** – Quality assurance checks will be used to identify data that exceed typical ranges. Emissions from various source sectors will be compared to other source sectors to make sure that the relative distribution meets our conceptual model. Any atypical data will be examined for further quality assurance.
- **Comparability** – Georgia APB will compare the new emissions to other available emission inventories (e.g., the most recent final NEI emissions or SESARM inventory, trade group information, etc.). Any differences of more than a factor of two (100% higher or 50% lower) will be identified and examined for further quality assurance.
- **Accuracy** – Georgia APB will ensure that all of the procedures/calculations that Georgia APB staff members develop and apply to correct existing data or to supplement existing data will be checked for accuracy.

Related to Stationary Point Sources Only:

The primary goal of the ECSU is to confirm the participation and submittal of emission inventories from applicable sources. To ensure this occurs, with EPD-IT help to ensure that the GECO website is ready for EI data collection, the ECSU generates the Emission Inventory mailout list and enrolls the facilities to the Emissions Inventory. Request letters and emails containing the facility's user ID and password with the registered user email address will be sent out to the facilities at the beginning of the year.

The first data quality objective (DQO1) is to ensure that all Title V facilities identified are correctly captured. In order to make sure that the facility is opted out correctly, the reviewer may review permits and its narratives. Additionally, facilities that have not operated the entire inventory year will be opted out from the emissions inventory. Once all stationary point sources have been identified and confirmed, they are enrolled in the annual emission inventory collection, if their potential-to-emit (PTE) emissions are above or equal to the threshold, and are required to submit their emission inventory data in GECO. The threshold is lower for the NEI year than the non-NEI year. Smaller Title V sources will only submit every 3 years. Through GECO, facilities must indicate if their emissions are above or below the AERR potential emissions thresholds when they first access the emission reporting link for a particular year.

The second data quality objective (DQO2), confirms that all facilities that choose to not participate in the annual emission inventory are valid non-participants. DQO2 requires an ECSU reviewer to confirm the information presented by the company via the internal QA/QC procedures. The staff member confirms the facility potential emission and facility operating status. If a facility has improperly chosen to not

participate (“opt out”) then the facility is notified and participates in the annual data submittal. Internal QA/QC procedures are followed to ensure data quality.

The final data quality objective (DQO3) is to confirm that emission inventories for all the submitted facilities pass the EPA QA exchange network tool. Once the emission inventory for a facility passes the EPA QA environment, then the emission inventory for the facility is submitted to the EPA production environment.

1.8 Special Training Requirements/Certification (EPA QA/R-5 A8)

All quality assurance staff shall have a minimum of a bachelor’s degree. The staff is trained in standard emissions estimation methods. Current training requirements are “in house” or on-the-job training. Several QA staff members volunteer in regional and/or national EI workgroups.

1.9 Documents and Records (EPA QA/R-5 A9)

Georgia APB will distribute copies of the QAPP, once approved, for use in this project to all project team members. We will document each of the data sources that are used in this project. These documents will include descriptions of each data source, and all manipulations that are performed on the data. We will maintain back-ups to allow for version control as original data are manipulated during the course of the project. Subsequently, there will be a backup of the original data to identify where problems originated. The main copy of the data will be located on the EPD drive (S:) with back-up copies on local drives (i.e., desktops).

2.0 DATA GENERATION AND ACQUISITION

2.1 Sampling Design (Experimental Design) (EPA QA/R-5 B1)

This element is not applicable to this project.

2.2 Sampling Methods (EPA QA/R-5 B2)

This element is not applicable to this project.

2.3 Sample Handling and Custody (EPA QA/R-5 B3)

This element is not applicable to this project.

2.4 Analytical Methods (EPA QA/R-5 B4)

This element is not applicable to this project.

2.5 Quality Control Requirements (EPA QA/R-5 B5)

This element is not applicable to this project.

2.6 Instrument/Equipment Testing, Inspection, and Maintenance (EPA QA/R-5 B6)

This element is not applicable to this project.

2.7 Instrument/Equipment Calibration and Frequency (EPA QA/R-5 B7)

This element is not applicable to this project.

2.8 Inspection/Acceptance Requirements for Supplies and Consumables (EPA QA/R-5 B8)

This element is not applicable to this project.

2.9 Data Acquisition Requirements (Non-Direct Measurements) (EPA QA/R-5 B9)

All stationary point source data is acquired directly from reporting facilities. Users of the emissions inventory web application that collects emissions inventory data are allowed to pre-populate the current year's data with a previous year's facility information for each process/emission unit. This increases the efficiency of collecting the emissions inventory data as users do not have to enter such data each year. Any missing or incorrect data being imported into the current emissions inventory is reviewed by EPD and the facility, and is further defined in the error and verification checks described in Section 4.2.

To ensure that certain data are not outdated, such as annual throughput or annual emissions data, those items are assigned null values during the data pre-population procedures. Then, during the required submittal procedure those items are checked and verified according to the procedures described in Section 4.2.

Georgia APB will utilize these main data sources in developing emission inventories for sources other than large stationary point sources:

1. EPA's latest final NEI (from a previous year) and draft NEI (for current year);
2. Southeastern States Air Resource Managers (SESARM) emission inventories;
3. Georgia Forestry Commission (GFC) fire records, as well as fire records kept by military bases and federal agencies;
4. MOVES County Databases (CDBs) for on-road and non-road emission inventories;
5. Atlanta Regional Commission (ARC) Travel Demand Model (TDM) miles traveled daily/hourly, road types, speed results;
6. Georgia Department of Transportation (GDOT) reports;
7. Georgia EPD I/M records;
8. IHS (automotive marketing data company) manages/warehouses automotive data;
9. Eastern Regional Technical Advisory Committee (ERTAC) databases for electricity generation;
10. Energy Information Administration (EIA), fuel information resource;
11. Oak Ridge National Laboratory (ORNL) databooks for non-road mobile sources;
12. Bureau of Economic Analysis (BEA) economic data for non-road mobile population growth;
13. City of Atlanta/Department of Aviation for Hartsfield-Jackson emissions data;
14. CSX and Norfolk Southern locomotive operations and emissions reporting to GDOT for newly converted locomotive; and
15. Other reports and information that is available.

The QA/QC procedures associated with each data source listed above will be reviewed by Georgia APB before the data are accepted for use. The Georgia APB will review EPA's draft NEI (for current year) before accepting estimates as a Georgia submittal. Georgia APB staff members have been actively involved in several EPA emissions inventory projects to ensure that the methodologies and QA/QC procedures are suitable and applicable for Georgia's emissions inventory.

2.10 Data Management (EPA QA/R-5 B10)

Stationary Point Sources Only:

Georgia EPD developed and the ECSU uses the GECO system that utilizes a Microsoft ASP.NET front end application with a MySQL database backend. The data management is handled by the GECO online system, the Integrated Air Information Platform (IAIP) and MySQL database internally. The final submittal to EPA occurs across the EPA Exchange Network through a series of staging tables and node transmission to the CDX development and final production environments.

Once the QA process begins for a set of facility information, the facility can no longer access their information for editing. This prevents any changes to the data without the knowledge of the ECSU. EPD-IT has created tracking and statistics tools in order to manage progress of the submitted facility information within the IAIP. Once the facility has passed the QA process, then the facility information is permanently stored within the MySQL database. All access within GECO and IAIP is account managed and only select staff members have access to the MySQL data tables.

All Sources:

Georgia APB, for all sources, will manage the data used in this project to preclude introducing errors that would result in an inaccurate emissions inventory. It is expected that all data inputs will be available from electronic data sets. After obtaining the necessary data, Georgia APB will convert the original data into the necessary formats. Georgia EPD will ensure that the conversion of the original data is performed

correctly via quality assurance checks, so that the total values reported in both data sets match. Georgia APB will run all data through available EPA quality assurance software to check for format and content errors. Byeong-Uk Kim, Stacy Allman, Richard McDonald, Jing Wang, Tao Zeng, and Gil Grodzinsky will perform all manipulations of the data under the direction of the Project Managers (Di Tian and Deborah Basnight).

All final records and reports will be saved on the EPD drive (S:) with back-up copies on local drives (i.e., desktops).

3.0 ASSESSMENT AND OVERSIGHT

3.1 Assessments/Oversight and Response Actions (EPA QA/R-5 C1)

For Stationary Point Sources:

- The annual emissions inventory has a submission deadline for the facilities of June 30 each year. As this deadline is not mandated by any regulation, the ECSU has some flexibility to work with each facility to provide an extension as needed.
- Submittal progress is monitored through the EIS Statistics tools in IAIP and notifications will be sent to those facilities that have not completed the submittal process.
- For submitted facilities, QA/QC progress is monitored through the IAIP emissions inventory report tool.

As part of the process for all sources, Georgia APB will perform its own internal review to ensure that all data are acceptable for use and that all necessary steps have been performed as planned. Byeong-Uk Kim, Stacy Allman, Richard McDonald, Jing Wang, Tao Zeng, and Gil Grodzinsky will ensure QA via spot checks of each data transformation/calculation step. In addition, Georgia APB staff will review the resulting emission estimates and identify any potential anomalies. Project staff will prepare multiple emission summaries (e.g., state-level by pollutant, state-level by pollutant and source category) comparing the new emission estimates with previous inventories. If there are significant differences in the emissions (more than a factor of two), Georgia APB staff will review the data to determine if the differences are caused by methodologies and/or data sources. Georgia APB staff will also use available EPA inventory quality assurance tools on the emissions inventory to identify any format, duplicate record, referential integrity, or data content issues that do not comply with EPA specifications. Finally, Georgia APB will create emission density spatial plots for each source sector and pollutant to visually compare emissions across counties. Georgia APB will correct any errors identified by these QA procedures.

3.2 Reports to Management (EPA QA/R-5 C2)

Upon final submission of each source category, the Task Leader will notify the Project Manager who will notify the QAPP Manager who will notify the Overall QAPP Manager.

4.0 DATA REVIEW AND USABILITY

4.1 Data Review, Verification, and Validation Requirements (EPA QA/R-5 D1)

Georgia APB will review all data before it is compiled into the final inventory. This review will ensure that the data has been downloaded correctly, and internally processed correctly. These reviews will include comparisons of pre-processed emissions with post-processed emissions. In addition, this project's emissions estimates will be evaluated for accuracy by comparing them with previous inventories. If there are significant differences in the emissions, Georgia APB staff will review the data to determine if the differences are caused by methodologies and/or data sources.

For stationary point sources, the emission inventory GECO EI online web application makes use of the requirements (data ranges, data precision and data format) in EPA's latest EIS Implementation Plan to create validators and error checkers as described in Section 4.2. This ensures that the data collected meets those requirements before the user can submit the data to the APB and EPA systems.

The state of Georgia does not collect hazardous air pollutants (HAPs) emissions from facilities and the 2015 AERR specifically states that this activity is voluntary. However, Georgia EPD has and will continue to review EPA's HAPs emission inventory for anomalies.

4.2 Verification and Validation Methods (EPA QA/R-5 D2)

For stationary point sources, the Emission Inventory data is collected using the web based application GECO based on Microsoft ASP.NET. Data validation is achieved using Microsoft ASP.Net validators. All validation is performed prior to the data being transmitted and saved to the database. Types of validators used include the following:

- Range Validator – verifies that the entered numerical data is within the required range
- Required Field Validator – verifies that a required field is not left blank by the user.
- Regular Expression Validator – verifies that entered strings match required formats (e.g. email addresses)
- Compare Validator – compares entered value against another value

In instances where one of the existing ASP.Net validators cannot be used to accomplish validation, custom validators are written to handle those situations.

Users of the emissions inventory web application are allowed to prepopulate data from a previous emissions inventory year and because of this it is possible they may not visit that data during the current data collection process. In some cases this may result in incorrect data or missing data values for the current emission inventory year. In order to catch such errors, the user must go through the required submission procedure. During the submission process, the data being submitted must go through a number of separate checks to verify that data has been updated for the current emission inventory year and that the submitted data is in accordance with the requirements of EPA's latest EIS Implementation Plan and any updates to those requirements. Additional checks are added, as needed, to the submission procedures. Any issues identified by the data checks and code tables are handled by revising the web application's code and updating look-up code tables. This is done by the EPD-IT Web Developer.

For other sources, the Georgia APB will utilize EPA's EIS QA Environment to assist in data verification and validation.

4.3 Reconciliation with User Requirements (EPA QA/R-5 D3)

For stationary point sources, once the QA has been completed, the QA results are examined for any critical errors or warnings. If the report indicates a critical error, then the reviewer will determine the best course of action to correct the error. The QA reviewer maintains a log of all EPA submittals for a given facility and keeps track of the errors and warnings. When emission inventories for all facilities have been successfully submitted to EPA, a review is performed and changes are proposed to the EPD-IT web developer to determine if any new validators or submittal checks need to be implemented in the GECO EI online application.

For all other sources, Georgia APB will compile potentially suspect entries identified from the methods described above.

5.0 REFERENCES

EPA, 1999: U.S. Environmental Protection Agency, National Risk Management Research Laboratory, “QAPP Requirements for Secondary Data Research Projects,” Washington, DC, July 1, 1999.

EPA, 2001: U.S. Environmental Protection Agency, Office of Environmental Information, “EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5,” EPA/240/B-01/003, Washington, DC, March 2001 (Reissued May 2006).

EPA, 2002: U.S. Environmental Protection Agency, Office of Environmental Information, “Guidance for Quality Assurance Project Plans, EPA QA/G-5,” EPA/240/R-02/009, Washington, DC, December 2002.

EPA, 2006: U.S. Environmental Protection Agency, Office of Environmental Information, “Guidance on Systematic Planning Using the Data Quality Objectives Process, EPA QA/G-4,” EPA/240/B-06/001, Washington, DC, February 2006.

EPA, 2017: U.S. Environmental Protection Agency, Office of Air Quality Planning Standards, “Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations”, EPA-454/B-17-002, Research Triangle Park, NC, May 2017

EPA website for Up to Date Guidance, Regulations, Documentation, and QA Tools:

<https://www.epa.gov/air-emissions-inventories>

(<https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-resources-state-local-tribal> provides up to data submission instructions for all source sectors)