

National Air Toxics Trends Station
Work Plan Template
Revised: April 2019

Introduction

Section 1: Project Description

Overview and Project Objectives

There are currently 187 hazardous air pollutants (HAPs), or air toxics, regulated under the Clean Air Act (CAA) that have been associated with a wide variety of adverse health effects, including cancer and neurological effects. These air toxics are emitted from multiple sources, including major stationary, area, and mobile sources, resulting in population exposure to these pollutants.

The National Air Toxics Trends Station (NATTS) program was developed to fulfill the need for long-term HAP monitoring data of consistent quality. This site is part of a national network of air toxics monitoring stations. The primary purpose of the NATTS network is tracking trends in ambient air toxics levels to facilitate measuring progress toward emission and risk reduction goals. The monitoring network is intended, over a multi-year period, to be able to detect a 15% difference (trend) between successive 3-year annual mean concentrations within acceptable levels of decision error.

EPA also implements the National Air Toxics Assessment (NATA) to help characterize the air toxics problem. Principal NATA activities include identification of areas of concern, characterizing risks and tracking progress. These objectives may be met in part through the measurement of technically consistent ambient concentrations of air toxics at trends monitoring sites throughout the nation. They are also met through the National-Scale Air Toxics Assessment (also referred to as NATA), a screening tool based on air quality modeling. Data from NATTS are used to evaluate the modeled concentrations from this assessment.

Project Outputs, Outcomes, and Linkage to the U.S. EPA's Strategic Goals

Outputs:

Successful annual NATTS site operation will result in the collection of a year's worth of quality-assured ambient air toxics measurements for selected HAPs with submittal to the national Air Quality Database (AQS).

Outcomes:

Short-Term Outcome

- Characterizing ambient levels of air toxics within community.
- Providing quality assured HAP data for trends determination

Intermediate Outcome

- Directly evaluating public exposure & environmental impacts in the vicinity of monitors;
- Providing quality assured HAPs data for risk characterization;

Long-Term Outcome

- Assessing the effectiveness of specific emission reduction activities;
- Evaluating and subsequently improving air toxics emission inventories and model performance.

Linkage to U.S. EPA's Strategic Goals:

The goals of the National Air Toxics Trends Sites support EPA's Draft 2018-2022 Strategic Plan, Goal 1, Core7 Mission – Deliver real results to provide Americans with clean air, land and water. EPA's Draft 2018-2022 strategic plan can be found at: <https://www.regulations.gov/document?D=EPA-HQ-OA-2017-0533-0001>.

Section 2: Project Network Design Plan

2.1 Site Selection

OAQPS, in conjunction with the EPA Regional Offices and State, Local, Tribal (SLT) air pollution control agencies, developed the NATTS. The network is comprised of ambient air monitoring stations – both urban and rural locations – which are representative of different parts of the country. NATTS monitoring was established at neighborhood-scale sites with preexisting PM_{2.5} speciation sampling.

(Describe the particular NATTS site.)

2.2 Meteorological Measurements

Measurement of site specific meteorological parameters is not a requirement of the NATTS Program but is highly desirable if it can be accomplished. Further information regarding in situ meteorological measurements is available in the NATTS Technical Assistance Document (<http://www.epa.gov/ttn/amtic/airtox.html>). If site specific meteorological monitoring is conducted, each site must provide parameter measurement details. If site specific meteorological monitoring is not conducted, each site must provide location and parameter details of the closest off-site meteorological monitoring station (i.e., National Weather Service, local airport, etc.).

2.3 Measured Pollutants. At a minimum, recipient agrees to the following:

- Acrolein ^a
- Benzene
- Butadiene, 1,3-
- Carbon tetrachloride
- Chloroform
- Ethylene oxide ^{**}
- Perchloroethylene (Tetrachloroethylene)
- Trichloroethylene
- Vinyl chloride
- Acetaldehyde
- Formaldehyde
- Benzo(a)pyrene
- Naphthalene
- Arsenic compounds (PM₁₀)
- Beryllium compounds (PM₁₀)
- Cadmium compounds (PM₁₀)
- Lead compounds (PM₁₀)
- Manganese compounds (PM₁₀)
- Nickel compounds (PM₁₀)

^a Guidance regarding acrolein sampling, analysis, and data reporting (Data Quality Evaluation Guidelines for Ambient Air Acrolein Measurements) is available at <http://www.epa.gov/ttn/amtic/airtox.html>

** The 2016 updated EPA unit risk estimate for ethylene oxide (EtO) identified EtO as a key cancer risk driver; therefore, EtO is being added to the list of required VOC measurements for all NATTS sites. The NATTS sites using EPA's national contractor for VOC analysis will have their samples analyzed for EtO beginning in July 2019. State labs should begin making any necessary lab changes to begin analyzing as soon as possible with the understanding that it may take several months before EtO data will be available. EPA will be providing training and guidance to assist State and Local NATTS Laboratories with implementing the addition of EtO to their analytical method.

Section 3: Monitoring Protocols

3.1 Sampling Methods and Minimum Detection Limits (MDLs). Recipient agrees to the following:

- TO-15 for all VOCs to include (at a minimum) acrolein, benzene, 1,3-butadiene, carbon tetrachloride, chloroform, perchloroethylene, trichloroethylene, and vinyl chloride.
- TO-11A for all carbonyls to include (at a minimum) acetaldehyde and formaldehyde.
- TO-13A / ASTM D 6209 for PAHs to include at a minimum benzo(a)pyrene and naphthalene.
- IO 3.5 for all PM₁₀ metals to include (at a minimum) arsenic compounds, beryllium compounds, cadmium compounds, lead compounds, manganese compounds and nickel compounds.
- Modified CARB Method 039 for TSP hexavalent chromium.

| Pollutant | Cancer Risk 10 ⁻⁶ (µg/m ³) As of 12/2017 ¹ | Noncancer at HQ=0.1 (µg/m ³) As of 12/2017 ¹ | Required MDLs (µg/m ³) |
|---|--|---|---------------------------------------|
| Acrolein | --- | 0.00200 | 0.09000 |
| Benzene | 0.13 | 3.00000 | 0.13000 |
| Butadiene, 1,3- | 0.03 | 0.20000 | 0.10000 |
| Carbon tetrachloride | 0.17 | 10.00000 | 0.17000 |
| Chloroform | --- | 9.80000 | 0.50000 |
| Ethylene oxide | 0.0002 | --- | 0.11000 |
| Perchloroethylene (Tetrachloroethylene) | 3.8462 | 4.00000 | 0.17000 |
| Trichloroethylene | 0.2083 | 0.2000 | 0.20000 |
| Vinyl Chloride | 0.11 | 10.00000 | 0.11000 |
| Acetaldehyde | 0.45 | 0.90000 | 0.45000 |
| Formaldehyde | 0.08 | 0.98 | 0.08000 |
| Benzo(a)pyrene | 0.00057 | --- | 0.00091 |
| Napthalene | 0.0294 | .4 | 0.02900 |
| Arsenic compounds (PM ₁₀) | 0.00023 | 0.0015 | 0.00023 |
| Beryllium compounds (PM ₁₀) | 0.00042 | 0.00200 | 0.00042 |
| Cadmium compounds (PM ₁₀) | 0.00056 | 0.001 | 0.00056 |
| Lead compounds (PM ₁₀) ^e | --- | 0.01500 | 0.01500 |
| Manganese compounds (PM ₁₀) | --- | 0.03 | 0.00500 |
| Nickel compounds (PM ₁₀) | 0.0021 | 0.00900 | 0.00210 |
| Hexavalent chromium (TSP) | 0.00008 | 0.01 | 0.00008 |

¹ Based on unit risk values and reference concentrations used in the 2017 National Air Toxics Assessment (NATA) See the NATA Technical Support Document posted at www.epa.gov/nata for more information.

Because of methodological uncertainties surrounding the measure of acrolein in ambient air, data quality evaluation guidelines were developed and are available at <http://www.epa.gov/ttn/amtic/files/ambient/airtox/20101217acroleindataqualityeval.pdf>. Acrolein health benchmark is the ATSDR MRL which was derived for intermediate-duration inhalation exposure (15– 364 days). If recipient chooses to monitor for Hexavalent chromium (TSP) they may do so and use either a state lab or the EPA National Contract lab to conduct analysis.

Sampling Frequency, Duration, and Quantity. Recipient agrees to monitor for all pollutants at a 1 in 6 day frequency for one year duration. The minimum numbers of samples required for the grant period of July 1, 2019 through June 30, 2020 is indicated in the table below.

| | 1 in 6 | Field Blanks | Base Total |
|-----------|--------|--------------|------------|
| Carbonyls | 61 | 12 | 73 |
| VOCs | 61 | 0 | 61 |
| Metals | 61 | 12 | 73 |
| PAHs | 61 | 12 | 73 |

3.3 Precision Measurements. For method precision measurements, if capability for duplicate or collocated monitoring exists, a minimum of 10% (6 samples) as shown in the table below is required. All analytical labs are required to perform replicate analysis for all pollutant categories to demonstrate analytical precision (6 replicate analyses).

| Duplicates or Collocates * | Replicates |
|----------------------------|------------|
| 6 | 6 |

** For sites with collocated or duplicate monitors, a minimum of six samples (10% of annual number of samples arising from 1 in 6 sampling frequency) is necessary for method precision calculations. In the absence of collocated or duplicate monitors, the base total in table 3.2 applies.*

Section 4: Quality Assurance Project Plan

Quality Assurance is an integral part of the NATTS program. OAQPS and the EPA Regional Offices review and track QA information in order to comply with the performance measures (i.e., Data Quality Objectives and Measurement Quality Objectives) that have been established for the program. The DQO and MQOs for the program are in the following document: The National Air Toxics Trends Stations - Quality Management Plan Final, located at <http://www.epa.gov/ttn/amtic/airtoxqa.html>. Outside of your normal quality assurance checks, the EPA requires that the State and Local agencies that support the NATTS participate in the following activities:

1. Analyze the quarterly Proficiency Testing (PT) samples that are provided by the designated EPA contractor.
2. Annually review and update the prior year Quality Assurance Project Plans (QAPPs) and associated Standard Operating Procedures (SOPs).
3. The recipient agrees to comply with the requirements of EPA CIO 2105.0-P-01-0, "EPA Quality Manual for Environmental Programs, May 2000", <https://www.epa.gov/quality/epa-quality-manual-environmental-programs>.

4. Submit air toxics collocated, duplicate and replicate data, as applicable, to the AQS database within 180 days after the end of the quarter.
5. Participate in NATTS teleconference calls that are initiated by OAQPS.
6. Participate in Regional air toxics monitoring teleconferences.
7. Provide OAQPS and/or their QA contractor with updated (not less than annually) method detection limits (MDLs) upon request.
8. Participate in OAQPS-instituted Technical Systems Audits.

Section 5: Reporting Requirements

Provide a detailed narrative about the data management and reporting of data for the NATTS (The NATTS Technical Assistance Document provides guidance on this matter) . Note that the following are required and not negotiable:

- Report all quality assured ambient monitoring data to the U.S. EPA's Air Quality System (AQS) Database (<http://www.epa.gov/ttn/airs/airsaqs>) on a quarterly schedule within 180 days of completing a data collection quarter.
- Follow all guidelines and procedures as detailed in the NATTS Technical Assistance Document (available on AMTIC) which include, but are not limited to, the following:
 - Include values below MDL; under no circumstances are data value substitutions (e.g., ½ MDL) acceptable. Values reported below MDL must be flagged appropriately.
 - Sample-specific "alternate" MDLs (the unique MDL generated for each individual sample) must be included with data reported to AQS.
 - Reporting units for all data, to include MDLs, must be as specified in the NATTS TAD (i.e., ppbv, µg/m³, ng/m³) specific to each target pollutant.
 - Units of mass per cartridge or filter are not acceptable.
 - For each monitor, in addition to the AQS required "Reporting" agency and "PQAO", report the "Collecting" and "Analyzing" agencies.
 - Thereafter, only subsequent changes need be entered.
- Submit quality assurance data (collocated, duplicate and replicate), as applicable, to the AQS database within 180 days after the end of the quarter.
 - Definitions for collocated, duplicate, and replicate data (*as well as associated requisite reporting procedures*) are provided in the NATTS TAD.

Section 6: Budget

6.1 Project Budget:

| | |
|--------------------------|-----------|
| A. Personnel | \$ |
| B. Fringe Benefits | \$ |
| C. Travel | \$ |
| D. Equipment | \$ |
| E. Supplies | \$ |
| F. Contractual | \$ |
| G. Other | \$ |
| Total Direct Charges | \$ |
| H. Indirect Charges | \$ |
| Grant Total | \$ |
| Federal Funds Requested: | \$ |

6.2 Explanation of Budget Framework:

Provide a rationale for the NATTS Funding Plan and provide a detailed narrative to support each budget object class outlined below.

- a. Personnel. Personnel costs are those costs for labor effort directly related to the air toxics monitoring grant. Identify all staff positions by job title, annual salary, percentage of time assigned to the project and total cost for the budget period. Any person identified must be an employee of your organization, not a consultant or personnel of a sub-grantee or subcontractor.
- b. Fringe Benefits. Fringe benefit costs are those costs for personnel employment other than the employees' direct income (i.e., employer's portion of FICA insurance, retirement, sick leave, holiday pay, and vacation cost) that will be paid by the grantee. Provide the total cost of fringe benefits unless treated as part of an approved indirect cost rate. Provide break-down of amounts and percentages that comprised fringe benefit costs, such as health insurance, FICA, retirement insurance, etc.
- c. Travel. Travel and per diem costs are those costs for travel and subsistence which are directly related to the grant. Identify the number of trips planned, the purpose of each trip, the destination for each trip, the number of travelers, and the estimated cost of each trip (e.g., monitoring, administrative activities, attendance at specific conferences, meetings, training, etc.).
- d. Equipment. Equipment, material, and supply costs are those costs directly related to the grant. Identify each item of equipment to be purchased which has an estimated acquisition cost of \$5,000 or more per unit and a useful life of more than one year. Provide a description of each item of equipment and its cost. No equipment may be purchased without the express Regional Office approval. If equipment purchased wholly or partially with assistance agreement funds is to be used on more than one project/program, acquisition costs or usage fees must be approved and allocated properly.
- e. Supplies. Equipment (less than \$5,000), material, and supply costs are those costs directly related to the grant. Identify all supplies purchased and its cost. The budget detail should be as descriptive as possible. Categories of supplies to be procured; e.g., laboratory supplies or office supplies, are acceptable if items cannot be reasonably separated. Provide the individual and total cost of supplies.
- f. Contractual. Contractual services are those services directly related to the EPA program/project. Identify each proposed contract and specify its purpose, nature, period of performance and estimated cost. Do not include procurement contracts which are reflected in other object class categories such as equipment, supplies, etc. If funds allocated to this object class category include proposed expenditures not usually categorized as services to be procured at the market place, explanatory footnotes must be included. Provide the total cost for contracts.
- g. Other. List each item of cost in sufficient detail for the EPA to determine its reasonableness and if it is allowable. Provide the individual and total cost for other.
- h. Direct Charges. Provide the individual and total amount of direct costs (items a-g above).

- i. Indirect Charges. Indirect costs result from allocation of a grouping of administrative costs which are not easily identified as a direct cost. Provide the total amount of indirect costs. Include a copy of your current indirect cost agreement which reflects the approved rate.

Section 7: Measures of Success

NATTS sites are expected to operate over not less than a six year period for assessments of national trends. Within a given year, data quality objectives will be met at a particular monitoring site if samples are collected on a 1-in-6 day sampling schedule with at least an 85% quarterly completeness. Monitoring data should be submitted to the Air Quality System (AQS) within 180 days of completing a data collection quarter.