



Roadmap to Broadly Applicable Approved Alternative EPA Test Methods



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VP Environmental Labs & *sometimes* Project Manager

- 16 years of fixed and mobile laboratory project management focusing on air measurements from stationary sources (stacks) & ambient air.
- Past 5 years spend as operational lead for 7 U.S. based laboratories with diverse, full-service offerings including air, soil, water.
- Co-authored/sponsored 4 EPA Alternative Test Methods (89, 100, 133, 136):
<https://www.epa.gov/emc/broadly-applicable-approved-alternative-test-methods>
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Abstract

The EPA's Air Emission Measurement Center (EMC) has four traditional air test method buckets available to them when drafting new regulations, guidance or requesting regulated entities to provide emission measurements from stationary sources (stacks).

1. EMC Promulgated Test Methods
2. EMC Conditional Test Methods (CTM)
3. EMC Other Test Methods (OTM)
4. Broadly Applicable Approved Alternative Test Methods (ALT)

Without these methods the ability of the EPA to regulate and enforce would be inhibited, because without a viable sampling and measurement approach there would be no mechanism to enforce a regulation. This presentation will provide an overview of the four air method buckets, how new methods are proposed and promulgated. It will also address the limitations of many existing methods and the appropriate path to gain a Broadly Applicable Approved Alternative Test Method from the EPA and how this tool benefits all stakeholders (public, industry, regulators) to generate reliable and defensible data.

What are the available EPA *Emission Measurement Center (EMC)* Test Methods and their use?

- Four types of EMC methods exist:
 1. EMC Promulgated Test Methods
 2. EMC Conditional Test Methods (CTM)
 3. EMC Other Test Methods (OTM)
 4. Broadly Applicable Approved Alternative Test Methods (ALT)
- EMC methods are two part: they provide both field sampling and laboratory analytical protocols.
- Methods are used to meet regulatory compliance for federal, state and local **regulations**.
- These methods are also used to demonstrate compliance to a facilities **permitted** emissions.

Do we have a problem?

- If we have air test methods to demonstrate compliance with regulations and/or permits then what is the problem?
 - Disclaimer
 - In general for **regulations**, the method(s) referenced to are well vetted. The applicability of a method has been reviewed from both a field sampling and laboratory analytical approach; the method referenced to demonstrate compliance with a regulation are sound. Yay for the rulemaking and comment period process.
 - For **permitted** emissions, often times the vetting process does not consider the compounds or industrial process. As a result sometimes compliance demonstration with the referenced or available methods is not possible.
 - For exaggeration sake: with the millions of **regulations** and **permits** there comes a time when the method(s) are unable to demonstrate compliance...yes we have a problem.

Where do we go?

- So it is inevitable that for some compliance demonstrations whether **regulation** or **permit** driven we are going to have to peruse method alternatives.
- **Test Specific Requests** – In particular for permit work notifying state regulators of the method variance needed to execute the test is often times addresses the concern – this should be done in advance of the test plan and addressed in the test plan. Communication is key.
- **Possible need for formal Alternative Test Method (ATM):**
 - Site specific issue that is not acceptably addressed with the above test specific request
 - An issue with a regulation's referenced method exists
 - An issue with the method itself exists
- Communicate to gain consensus, and collaborate to solve the problem

Where do we NOT go?

- We do not simply add a M (modification) to the end of a reference method and call it a day.
- We do not bury our changes in a field test report.
- We do not bury our changes in a lab report narrative.
- We don't hide behind the deficiency, we solve the problem.

What is an Alternative Test Method (ATM)?

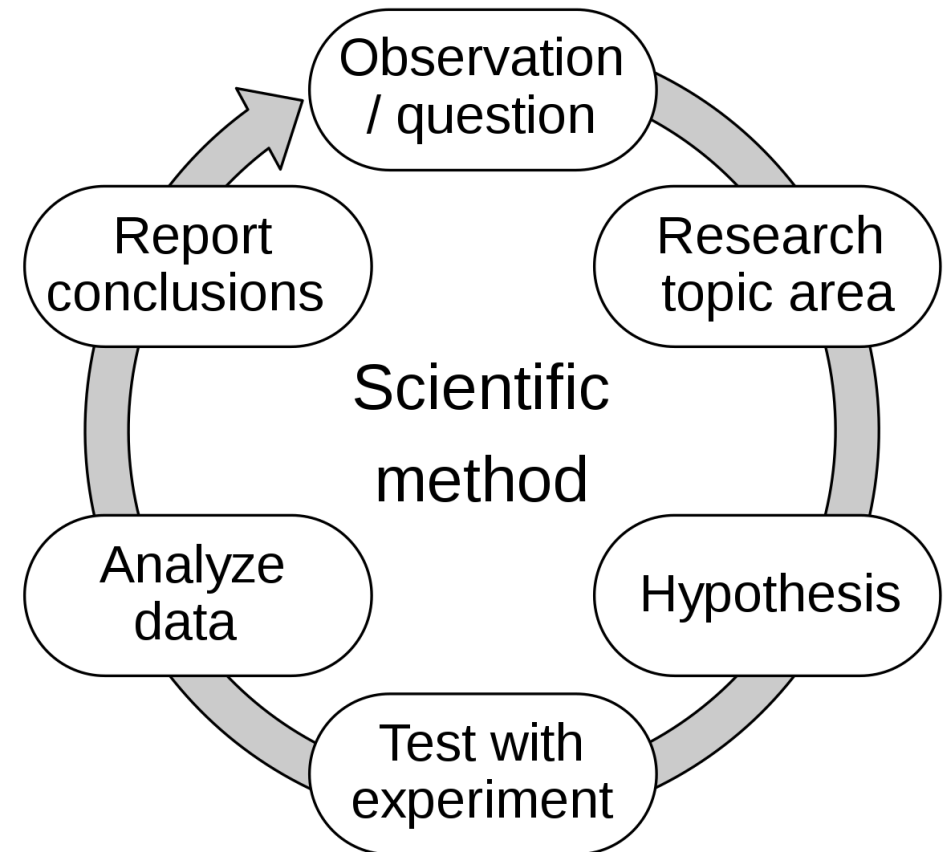
- ATMs are typically modifications to an existing method or the variance of a method.
- modifications to existing method(s):
 - Improves method accuracy or robustness
 - Changes in the sampling or analytical approach used
 - Example: use of a HPLC instead of GC
- variance of method, the use of a different method to meet a regulation or permit, because of:
 - Consideration of the industrial process
 - There is just a better method to meet project objectives
 - Example: substituting method x for method y

What is the Process in Seeking an ATM?

Return to the basis of the scientific method

This is the Roadmap:

1. Identify the problem (**Observation & Research**):
 - Why can the method not address the regulation?
 - Is this problem method or process related?
 - Who is impacted?
 - Identify Stakeholders: regulators, facility, consultant, tester, laboratory, public

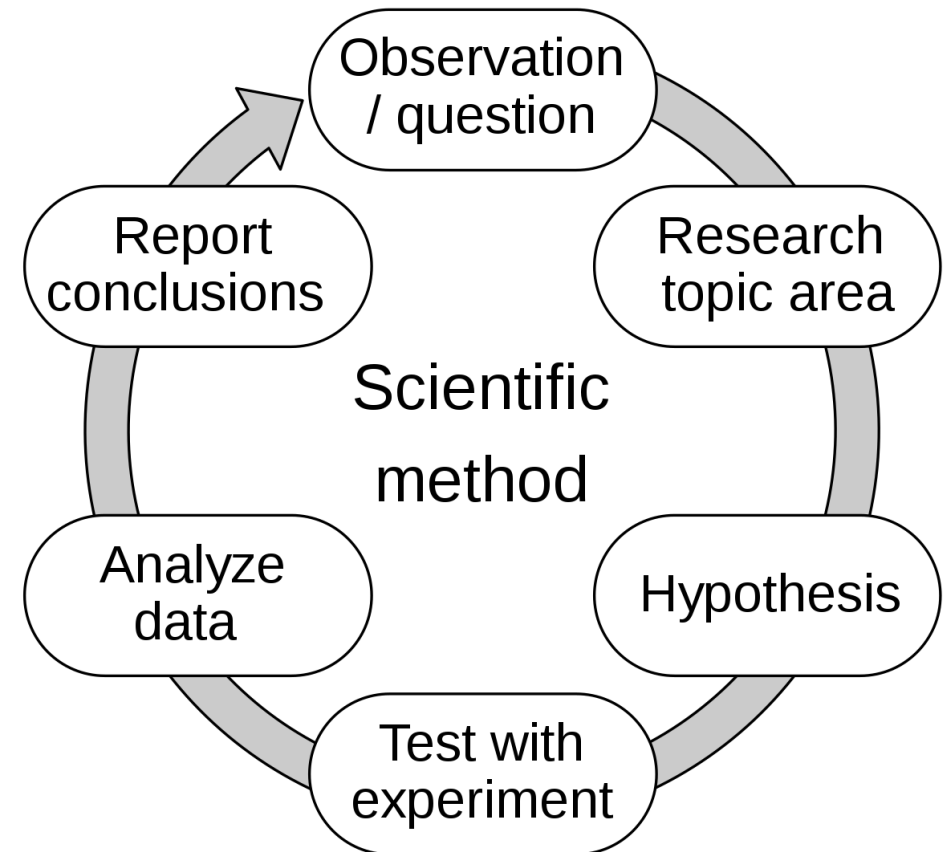


What is the Process in Seeking an ATM?

Return to the basis of the scientific method

This is the Roadmap:

2. How can this problem be remedied (**Hypothesis**):
 - Stakeholders come to a consensus on what changes could be done to address problem
 - Develop detailed test plan
3. Perform field or in-lab study (**Test**):
 - Benchmark existing method vs. proposed method/changes
 - Multiple replicates



What is the Process in Seeking an ATM?

Return to the basis of the scientific method

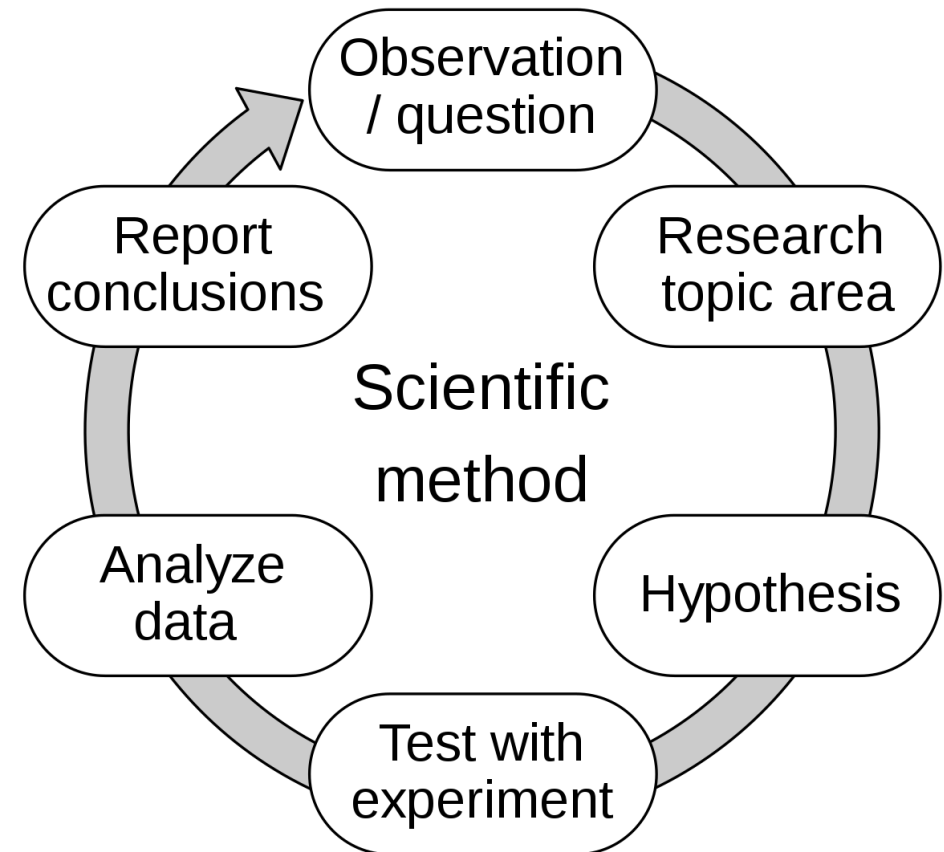
This is the Roadmap:

4. Analyze Data

- Compare existing and proposed technique data
- How is the data the same, how is it different – WHY?

5. Report

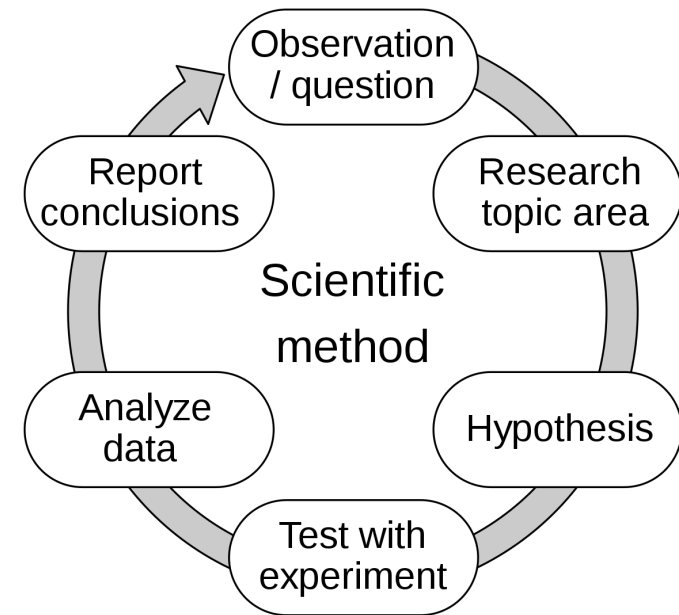
- If data is robust and provides scientific support, submit formal ALT method request to EPA



ATM Case Study: ALT 100

1. Identify the problem (**Observation & Research**):

- 40 CFR 60.18(f)(3) – regulatory guidance to determine the Heat Content (BTU/SCF) of flares.
- In this guidance the measurement method referenced was EPA Test Method 18.
- Method 18 uses Tedlar bags to collect whole air samples, these whole air samples are analyzed for hydrocarbons from where the BTU/SCF is calculated.
- Problem is identified: flammable gas should not be collected in what essentially amounts to a Ziploc bag
- Stakeholders: industry, stack testers, laboratories
- The method can address the regulation, BUT it cannot due it safely



ATM Case Study: ALT 100

2. How can this problem be remedied (**Hypothesis**)
 - Stakeholders discuss this concern with EPA and their suggestion was to pursue an ALT Method request
 - *Hypothesis*: If samples were collected in 'Summa' canisters instead of Tedlar bags, data quality would not be compromised, and safety concerns would be reduced
 - Stakeholders designed a 6 replicate test collecting the gas samples in both Tedlar bags from varying industrial source
3. Perform field or in-lab study (**Test**):
 - Collaborative effort between stakeholders: facility (made sources available), tester (sampling), lab (analysis)

Tedlar Bag



'Summa' Canister



ATM Case Study: ALT 100

4. Analyze Data

- Samples were collected by the tester, analyzed by the lab, and reported to tester and facility
- Stakeholders reviewed lab and field data

5. Report

- All stakeholders (facility, tester, lab) jointly generated a field report and level 4 data package which were submitted to EPA for consideration
- The comprehensive report contained a detailed narrative discussing steps 1-4 with the request that a Broadly Applicable ALT Method be granted
- The conclusion (what the data means) was left up to the EPA

An ALT Method is born

- With a thorough review and additional questions EPA Alternative Test Method 100, *Approval of Canister Sampling with Method 18 with Flares*, was granted: <https://www.epa.gov/sites/default/files/2020-08/documents/alt100.pdf>
- This broadly applicable ALT Method will provide safety for everyone (sample are shipped), increase sample integrity without compromising data quality.
- Because this was requested and granted as Broadly Applicable, it can apply to all flare sources under 40 CFR 60.18 without regulatory challenge.

Thank you & Questions

Collaborating with my colleagues, bettering science, increasing safety has been one of the most rewarding experiences of my career, I appreciate your time and am happy to answer any questions you may have.

