



Procedures on AIMM Process AQCC Regulation No. 7

Summary

Purpose:

This document provides an overview of the key elements and process required for approval of a proposed instrument monitoring method by Colorado's Air Pollution Control Division ("Division").

Definition of AIMM:

"Approved instrument monitoring method" ("AIMM") means an infra-red camera, EPA Reference Method 21 ("Method 21"), or other Division approved instrument based monitoring device or method. Any instrument monitoring method approved by the Division must be capable of detecting leaks as defined in Section XVII.F.6 (AQCC Regulation No. 7, Section XVII.A.2). These methods and technologies must be utilized for monitoring storage tanks and components at well production facilities and natural gas compressor stations. The AIMM must be capable of measuring hydrocarbon compounds at the applicable leak definition concentration specified in AQCC Regulation No. 7, and calibrated as appropriate (see EPA Method 21 at Section 6.0 and AQCC Regulation No. 7, §XVII.F.6). While AQCC Regulation No. 7 identifies EPA Method 21 and the IR camera for leak detection, the intent is to not limit leak detection to only EPA Method 21 and the IR camera as the Division may approve the use of additional monitoring devices and methods.

AIMM applications will be classified and evaluated by the Division using the following categories:

Quantitative – Has the ability to measure the actual concentration of a leak in parts per million ("ppm").

Regulation No. 7 §XVII.F.6.a.- For EPA Method 21 monitoring, or other Division approved quantitative instrument based monitoring, at facilities **constructed before May 1, 2014**, a leak is any concentration of hydrocarbon above 2,000 parts per million (ppm) not associated with normal equipment operation, such as pneumatic device actuation and crank case ventilation, except for well production facilities where a leak is defined as any concentration of hydrocarbon above 500 ppm not associated with normal equipment operation, such as pneumatic device actuation and crank case ventilation.

Regulation No. 7 §XVII.F.6.b. - For EPA Method 21 monitoring, or other Division approved quantitative instrument based monitoring, at facilities **constructed on or after May 1, 2014**, a leak is any concentration of hydrocarbon above 500 ppm not associated with normal equipment operation, such as pneumatic device actuation and crank case ventilation.

Non-Quantitative – Can detect leaks but is unable to measure actual leak concentrations.

Regulation No. 7 §XVII.F.6.c. - For infra-red camera and Audio/Visual/Olfactory ("AVO") monitoring, or other Division approved non-quantitative instrument based monitoring, a leak is any detectable emissions not associated with normal equipment operation, such as pneumatic device actuation and crank case ventilation.

A key component of any AIMM under consideration is that the technology must be able to pinpoint the location of leaking or venting emissions, and if a quantitative method, be able to detect the entire range of



hydrocarbons being leaked/vented. More specifically, a technology must be able to identify the source of the emissions so that operators may perform repair under applicable leak detection and repair schedules and/or evaluate for emission capture performance under the Storage Tank Emissions Monitoring (STEM) plans. For example, an AIMM finding a leak at a thief hatch must be able to identify whether the leak is a result of a bolt hole or is actually a result of venting from the thief hatch.

The Division will review the following criteria for application approvals:

Minimum Criteria		
	Quantitative	Non-Quantitative
What is the Technology? -Limitations	1) Capable of detecting all Hydrocarbons 2) Testing/certification- must be repeatable <ul style="list-style-type: none"> o Past demonstrated successes o Appropriate for conducting STEM/LDAR under Regulation No. 7 o Lessons learned 3) Limitations (weather/temperature/moisture, maximum/minimum operating parameters, other) 4) Other applications or uses (i.e. pipeline monitoring) 5) How does it work?	
	6) Minimum/Maximum detection threshold 7) <u>Method to quantify PPM thresholds</u>	
How will it be used? +maintained/calibrated	1) Calibration process 2) User guide 3) Manufacturer maintenance/other 4) Formal training 5) Field test may be requested	
Process for recordkeeping		
Training Required for use		
Comparative Monitoring	Has the technology completed monitoring in conjunction with either the IR Camera or Method 21? * The division will determine if comparative monitoring is necessary if not included	



Minimum elements for AIMM approval

- 1) Is the proposed AIMM in the development, testing or prototype phase?
 - The Division will not consider the proposed AIMM until it is available for commercial use/application and has repeatable proven or demonstrated success in the field for hydrocarbon leak detection.
- 2) Is the proposed AIMM already in use or approved as a hydrocarbon leak detection technology in other applications/areas or by other regulatory authorities (for ex., pipeline leak monitoring)?
 - The Division may expedite the review and approval process, but will still need to consider the AIMM's capabilities and limitations based on recommendations in this document and/or other issues known or identified. Companies requesting approval must include this information in the application to sufficiently establish the ability of the technology to achieve the elements under Regulation No. 7, §XVII.A.2 & XVII.F.6.
- 3) How is a leak identified using the proposed AIMM?
 - Considerations include how the AIMM works and its leak detection capability and reliability, as well as how leaks and venting events are tracked and recorded. This information should be available or provided in easy to understand terms or language.
 - What are the proposed AIMM's leak/venting detection limitations or requirements? For example, how effective is it under different types of weather conditions, wind speeds and temperatures? See also #6 – lower detection limit.
 - Field demonstration may be required.
- 4) Does the proposed AIMM perform quantitative or non-quantitative leak detection/venting identification or both? If both, how will the AIMM be classified (quantitative vs. non-quantitative) in regard to leak detection and venting requirements outlined in Regulation No. 7?
 - Depending on quantitative or non-quantitative classification by Division, the AIMM will need to follow applicable requirements in Regulation No. 7 §XVII.F.6.
 - To be considered quantitative, must be capable of detecting entire range of hydrocarbons and specifying in parts per million (ppm).
- 5) What is the proven lower detection limit of the AIMM and what hydrocarbons is it capable of detecting or quantifying?
 - What is the ideal or manufacturer-recommended distance for most effective leak detection using the AIMM?
 - What is the maximum distance for the lower detection limit of the AIMM?
- 6) Is the proposed AIMM capable of identifying specific leak/vent locations (i.e., component or piece of equipment leaking or thief hatch) or only if leak(s)/venting are detected at a site, facility or within a general area?
 - Technologies must be able to identify specific leak/vent locations in order to be considered for AIMM.
- 7) How is the proposed AIMM used?
 - Considerations include whether use of AIMM is done by foot, vehicle or air, and if the leak monitoring is performed manually (by a human) or automatically (continuous monitoring)?
 - What is the ease of use of the proposed AIMM (easy, moderate, difficult)?
 - If manual monitoring, what is the training and/or certification required to operate and understand the AIMM?



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- If automatic monitoring, what are the calibration and/or maintenance requirements (manufacturer-recommended) for the leak detection system and how often must they be performed? Also, what is the scanning or viewing range of the leak detection system and what are the required number of leak detection devices for the facility size and set-up?
- 8) If the proposed AIMM utilizes continuous emission monitoring, what are the considerations for approval of a streamlined inspection and reporting program, per Regulation No.7 §XVII.A.2?
- AIMM technology that utilizes continuous emission monitoring will be evaluated on a case-by-case basis by the Division; the Division will evaluate a proposed streamlined program submitted by the companies desiring to use the technology.
- 9) What are the proposed AIMM's data logging and location (for ex., GPS) capabilities?
- Must be able to satisfy the recordkeeping and reporting requirements in Regulation No. 7 §XVII.F.8 and 9.
- 10) How will a leak be confirmed as repaired using a Division-approved AIMM?
- Must be re-monitored using the approved AIMM, IR Camera or EPA Method 21. If a quantitative device or method is used for confirming, the repair is satisfactory if the quantitative leak threshold requirements in Regulation No. 7 §XVII.F.6 are met. If an IR Camera or other non-quantitative AIMM is used for confirming repair, then repair is satisfactory if no leak is detected. See also #7.
- 11) How will the Division issue or grant approval of a proposed AIMM?
- An approval letter will be sent to the applicant that will outline the conditions or requirements for use of the AIMM.

Questions for companies and sources considering applying for an alternate AIMM:

- 1) Can a company or manufacturer of a proposed AIMM request Division approval of the AIMM or must it be done by an oil & gas company, consultant or service company interested in using or purchasing the AIMM?
- Should not matter so long as the AIMM has repeatable proven or demonstrated success in the field in leak detection.
- 2) If a technology uses infra-red technology, is it already an AIMM that sources may use to satisfy LDAR and STEM monitoring requirements?
- If the infra-red technology is capable of measuring hydrocarbon compounds at the applicable leak definition concentration specified in the revisions, it may be an acceptable AIMM under the current definition of the rule.

Process for Approval:



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1. Applicants will submit complete applications to the Division for review. The Division will review applications on a quarterly basis. Any application that is submitted incomplete will be rejected and the applicant will be asked to resubmit a complete application for review. The application must include the information listed above.
2. Following the review of the application, the Division will contact the applicant to schedule a field demonstration. After verification of proficiency of the technology, the Division will issue an approval letter.
3. Approval Letters will be issued to the applicant and/or posted on the Division's website. Anyone who is properly trained and certified in operation and calibration of the AIMM can print the approval letter and will not need to submit a new AIMM application. If a company wishes to alter or make changes in the operation or calibration processes a new AIMM application is required to be submitted for Division approval.

Description of the Application form:

Applicants can contact the Division for an application form. Applicants should ensure the application is complete before submittal. The Division will reject any incomplete applications.

It is recommended that the manufacturer of the proposed instrument monitoring method submit the application to receive the approval letter. Upon approval the manufacturer can distribute the approval to interested parties after proper training has been conducted.

For More Information:

Please contact Jennifer Mattox (303-692-3185) or Tim Taylor (303-692-3173) for questions or concerns.