

Management Alert: Evaluation of the ASPECT Aircraft's Chemical- Sensing Capability

June 23, 2026 | Report No. 26-E-0038



Abbreviations

ASPECT	Airborne Spectral Photometric Environmental Collection Technology
EPA	U.S. Environmental Protection Agency
OIG	Office of Inspector General
OSC	On-Scene Coordinator

Cover Image

The belly of the ASPECT aircraft in flight. The image shows a white airplane against a blue sky. The word "US" is on one wing of the airplane, while the word "EPA" is on the other. (EPA image)

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OFFICE OF INSPECTOR GENERAL
U.S. ENVIRONMENTAL PROTECTION AGENCY

June 23, 2026

MEMORANDUM

SUBJECT: Management Alert: Evaluation of the ASPECT Aircraft's Chemical-Sensing Capability
Report No. 26-E-0038

FROM: Nicole N. Murley, Deputy Inspector General performing the duties
of the Inspector General *Nicole N. Murley*

TO: Thomas Croci, Acting Assistant Administrator
Office of Land and Emergency Management

This is our report on the subject evaluation conducted by the U.S. Environmental Protection Agency Office of Inspector General. We initiated this evaluation in response to a complaint submitted to the OIG Hotline. We did not issue a notification memorandum before initiating the evaluation. This report contains findings that describe the problems the OIG has identified and corrective actions the OIG recommends. Final determinations on matters in this report will be made by EPA managers in accordance with established audit resolution procedures.

Our objective was to determine whether the chemical-sensing capability of the EPA's Airborne Spectral Photometric Environmental Collection Technology, or ASPECT, aircraft is functioning as designed. As we detail in the report below, when ASPECT's chemical sensing is functioning as designed, it can process and provide data to first responders in approximately five minutes. Currently, however, ASPECT's chemical sensing requires manual analyses, which generally produce monitoring results in about one week. This delay hampers the functionality of ASPECT. Given the unpredictable nature of natural and manmade disasters and emergency incidents, we are alerting you about the situation and recommending corrective action.

In accordance with EPA Manual 2750, your office provided acceptable planned corrective actions and estimated milestone dates in response to our two recommendations. Both recommendations are resolved, and no final response to this report is required. If your office submits a response, however, it will be posted on the OIG's website, along with our memorandum commenting on the response. The response should be provided as an Adobe PDF file that complies with the requirements of section 508 of the Rehabilitation Act of 1973, as amended. The final response should not contain data that your office does not want released to the public; if the response contains such data, your office should identify the data for redaction or removal along with corresponding justification.

We will post this report to our website at www.epa.gov/oig.

Background

According to the EPA, ASPECT is an emergency response tool for airborne real-time chemical, radiological, and photographic data collection. ASPECT can detect and identify hazardous industrial chemicals, chemical warfare agents, and surface oil and radiation sources, and it can produce thermal and photographic images. ASPECT accomplishes this with chemical sensors, radiological sensors, an aerial camera system, and a broadband satellite data system installed in a fixed-wing aircraft to image, map, identify, and quantify chemicals and deposited radioisotopes. The ASPECT aircraft is based near Dallas, Texas. It is available for deployment 24 hours a day, 365 days per year, with wheels-up capability within one hour. The aircraft can begin collecting data at any site in the continental United States within nine hours of a request. ASPECT is deployed at the request of an EPA on-scene coordinator, or OSC.

What is an on-scene coordinator?

An OSC is a federal official “responsible for monitoring or directing responses to all oil spills and hazardous substance releases reported to the federal government. OSCs coordinate all federal response efforts with, and provides support and information to, local, state, and regional response communities. An OSC is an agent of either EPA or the U.S. Coast Guard, depending on where the incident occurs. EPA’s OSCs have primary responsibility for spills and releases to inland areas and waters. U.S. Coast Guard’s OSCs have responsibility for coastal waters and the Great Lakes.”

—“[EPA’s On-Scene Coordinators](#)” web page, dated February 20, 2026

Our evaluation focuses on ASPECT’s chemical-sensing capabilities. The main purpose of ASPECT’s chemical monitoring is a screening function; in other words, ASPECT is designed to monitor for chemical contamination by quickly screening a large area to identify the presence of any chemicals that should receive more detailed ground-level monitoring. ASPECT automatically monitors for a suite of 78 chemicals, including five chemical warfare agents, two of which are nerve agents. ASPECT’s chemical sensing consists of two components:

- The physical sensors on the aircraft that detect and quantify chemicals present in the air column between the aircraft and the ground.
- A software algorithm that filters background noise and common atmospheric constituents and then automatically searches in near real-time for 78 chemicals in the air column below the aircraft.

If those two components are working as designed, ASPECT can rapidly identify whether there are any regions of concern, what chemicals are present, what the estimated concentrations of those chemicals are, and how far the chemical contamination spreads, and it can quickly relay that information to the OSCs. According to an EPA webinar on ASPECT, once the chemical sensors collect the raw data, it should take about five minutes for the software to process and provide the chemical-monitoring results to the OSCs and other first responders.¹ If needed, the OSCs can then conduct more detailed assessments using

¹ According to EPA staff, when OSCs request ASPECT deployment, they can also choose additional chemicals for which to screen from a list of more than 500. Monitoring results for these additional chemicals would take longer to process than the automatic suite of 78 chemicals.

ground-based direct measurement. These ground-based technologies can provide more accurate quantification for decision-making purposes.

Scope and Methodology

Earlier this year, we received a hotline complaint alleging that the EPA has not properly maintained ASPECT's chemical sensors and that these sensors are not functioning as designed. We conducted this evaluation in accordance with the *Quality Standards for Inspection and Evaluation* published in December 2020 by the Council of Inspectors General on Integrity and Efficiency. Those standards require that we perform the evaluation to obtain sufficient and appropriate evidence to support our findings. Due to the sensitive nature of our evaluation and the fact that we did not obtain confirmation until mid-May that there is an issue with ASPECT's chemical-sensing capability, we did not issue a notification memorandum announcing our intent to undertake this evaluation; however, we did communicate with the agency as appropriate. We reviewed documents, websites, and webinars on the ASPECT's capabilities, including chemical sensing. We interviewed the complainant as well as the former data-processing subcontractor for ASPECT and ASPECT program staff and managers to determine whether ASPECT's chemical-sensing capability is functioning as designed.

Results

The ASPECT program manager stated that the aircraft's existing chemical sensors are nearing the end of their useful life. Problems with the existing chemical sensors impact the algorithm that is used for rapid data turnaround. In other words, the five-minute target for providing chemical-monitoring results for the automatic suite of 78 chemicals to OSCs and other first responders is no longer possible. Instead, according to the ASPECT program manager, manual analyses are required, which generally produce monitoring results for a single flight of data collection in about one week. This delay could reduce the benefit of having the data during an emergency response, as results indicating which chemicals should be monitored at the ground level may not be available in a timely manner.

According to the ASPECT program manager, other components of ASPECT, including thermal imaging and radiation detection, still function as designed, and the OSCs would be informed when they request ASPECT deployment of the chemical-sensing processing delays. However, the EPA has not proactively or directly communicated the ASPECT's chemical-sensing limitations to all OSCs, leaving them unaware of the deficiency. In an emergency incident, timely decisions matter. If an OSC assesses the need for ASPECT and requests its deployment, only to learn that chemical-sensing data would not be available until a week later, then the OSC may have wasted valuable time that could have been spent generating an alternative plan to quickly assess the emergency incident and ambient air.

The EPA is in the process of replacing the ASPECT chemical sensors, with delivery of the first units of new sensors expected at the end of June 2026 and the second units expected by the end of September 2026. The second units of new sensors will serve as backups to the first units. According to the ASPECT program manager, it will take several months to test and evaluate the new sensors, and integration of the new sensors into ASPECT will occur as soon as possible in early to mid-2027. The ASPECT program manager

expressed the EPA's intent to use a new off-the-shelf software algorithm with the new sensors. The ASPECT program manager also noted that it took four years to procure the new sensors.

Conclusions

We issued this management alert because OSCs could request ASPECT deployment at any time. It is important for all OSCs and other stakeholders to know in advance that ASPECT's chemical-sensing capability is not working as designed. This knowledge will allow OSCs and stakeholders to, in the case of an emergency incident, make alternative plans to quickly assess the incident site and ambient air. Having ASPECT's chemical sensors fully functioning at all times is needed for the rapid detection of harmful contaminants to protect human health and the environment.

Recommendations

We recommend that the assistant administrator for Land and Emergency Management:

1. Ensure that Airborne Spectral Photometric Environmental Collection Technology staff inform all on-scene coordinators of the Airborne Spectral Photometric Environmental Collection Technology's current capabilities and the timeline for the expected enhancements. Doing so would allow the EPA's on-scene coordinators to, in the case of an emergency incident, make alternative plans to quickly assess the incident site and ambient air until the Airborne Spectral Photometric Environmental Collection Technology regains its full capabilities.
2. Procure, test, and integrate the new chemical sensors into the Airborne Spectral Photometric Environmental Collection Technology aircraft as soon as practicable. Doing so would allow the aircraft's capabilities to continue to meet the expectations of the EPA's on-scene coordinators for rapid chemical monitoring during an emergency incident.

Agency Response and OIG Assessment

The agency agreed with our two recommendations, which we consider resolved with corrective actions pending. For recommendation 1, according to the agency, it has updated its Emergency Operations Center Asset Status Tracker tool to indicate the current status of the data analysis turnaround time for chemical data, has briefed Superfund removal managers on the current status, and will publish a statement on the status of the ASPECT chemical sensors to be distributed to regional Superfund managers by July 31, 2026. For recommendation 2, according to the agency, it has procured new chemical sensors to replace the current ones. The agency will test and evaluate the sensors to ensure that they meet the EPA's needs. Pending the results of the evaluation, the agency will integrate the sensors onto the ASPECT aircraft by June 2027, and it will notify program stakeholders of the new sensors' capabilities by July 31, 2027. The agency's response to our draft report is in appendix A. The agency also provided technical feedback, which we considered and incorporated into our report as appropriate.

Status of Recommendations

Rec. No.	Page No.	Recommendation	Status*	Action Official	Planned Completion Date
1	4	Ensure that Airborne Spectral Photometric Environmental Collection Technology staff inform all on-scene coordinators of the Airborne Spectral Photometric Environmental Collection Technology's current capabilities and the timeline for the expected enhancements. Doing so would allow the EPA's on-scene coordinators to, in the case of an emergency incident, make alternative plans to quickly assess the incident site and ambient air until the Airborne Spectral Photometric Environmental Collection Technology regains its full capabilities.	R	Assistant Administrator for Land and Emergency Management	7/31/26
2	4	Procure, test, and integrate the new chemical sensors into the Airborne Spectral Photometric Environmental Collection Technology aircraft as soon as practicable. Doing so would allow the aircraft's capabilities to continue to meet the expectations of the EPA's on-scene coordinators for rapid chemical monitoring during an emergency incident.	R	Assistant Administrator for Land and Emergency Management	7/31/27

* C = Corrective action completed.

R = Recommendation resolved with corrective action pending.

U = Recommendation unresolved with resolution efforts in progress.

Agency Response to Draft Report



OFFICE OF LAND AND EMERGENCY MANAGEMENT
WASHINGTON, D.C. 20460

MEMORANDUM

SUBJECT: Response to the Office of Inspector General Management Alert, Evaluation of the ASPECT Aircraft's Chemical-Sensing Capability, draft released June 15, 2026

FROM: Thomas Croci
Acting Assistant Administrator

Croci,
Thomas

Digitally signed by Croci, Thomas
Date: 2026.06.17 17:53:59 -04'00'

TO: Paul H. Bergstrand, Assistant Inspector General
Office of Special Review and Evaluation
Office of Inspector General

Thank you for the opportunity to respond to the issues and considerations in the subject Management Alert. The following is the U.S. Environmental Protection Agency's overall position on the recommendations and includes the Office of Land and Emergency Management (OLEM)'s list of corrective actions to address the recommendations.

AGENCY'S OVERALL POSITION

OLEM agrees with the draft report recommendations and has provided corrective actions and estimated completion dates below. In addition, for your consideration, we have included a technical comments attachment to supplement this response.

OSEM has initiated efforts to address the OIG recommendations as detailed in the table below.

CORRECTIVE ACTION(S)

Recommendation	Office	High-Level Intended Corrective Action(s)	Estimated Completion Date
<p>1. Ensure that Airborne Spectral Photometric Environmental Collection Technology staff inform all on-scene coordinators of the Airborne Spectral Photometric Environmental Collection Technology's current capabilities and the timeline for the expected enhancements. Doing so would allow the EPA's on-scene coordinators to, in the case of an emergency incident, make alternative plans to quickly assess the incident site and ambient air until the Airborne Spectral Photometric Environmental Collection Technology regains its full capabilities.</p>	Office of Land and Emergency Management	1.1 The ASPECT program will update the HQ Emergency Operations Center (EOC) ArcGIS Asset Status Tracker tool, which every OSC has access to individually or through their Regional EOCs and phone and response duty officers, to indicate the current status of the data analysis turnaround time for chemical identification spectra collected by ASPECT.	COMPLETE
	Office of Land and Emergency Management	1.2 The program office will brief the Superfund Removal Managers on the current status of the data analysis turnaround time for chemical identification spectra collected by ASPECT at an upcoming Removal Managers meeting.	COMPLETE
	Office of Land and Emergency Management	1.3 The program office will draft and publish a desk statement on the status of the ASPECT chemical sensors, including the current status of the data analysis turnaround time for chemical identification spectra collected by ASPECT as well as plans for sensor upgrades in the near future, that will be distributed to the	July 31, 2026

Recommendation	Office	High-Level Intended Corrective Action(s)	Estimated Completion Date
		Regional Superfund Managers.	
2. Procure, test, and integrate the new chemical sensors into the Airborne Spectral Photometric Environmental Collection Technology aircraft as soon as practicable. Doing so would allow the aircraft's capabilities to continue to meet the expectations of the EPA's on-scene coordinators for rapid chemical monitoring during an emergency incident.	Office of Land and Emergency Management	2.1 The ASPECT program will procure new commercial-off-the-shelf aerial hyperspectral imaging (HSI) sensors to evaluate and replace the current ASPECT chemical FTIR and IRLS systems.	COMPLETE
	Office of Land and Emergency Management	2.3 The ASPECT program will test and evaluate the new HSI sensors to ensure they meet EPA's data collection needs and, pending the results of the evaluation, integrate the HSI sensors onto the ASPECT aircraft.	June 2027
	Office of Land and Emergency Management	2.3 Once the HSI sensors are cleared for regular, operational use, program stakeholders will be notified of the change in technology and any associated capability changes.	July 2027

CONTACT INFORMATION

If you have any questions regarding this response, please have your staff contact the OLEM Audit Follow-up Coordinator, Kecia Thornton, Thornton.Kecia@epa.gov or the OSEM Audit Liaison, Yolanda Allen, Allen.Yolanda@epa.gov.

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