

Clean Air Status and Trends Network

First Quarter 2025 Quality Assurance Report

Summary of Quarterly Operations (January through March)

Submitted to U.S. Environmental Protection Agency (EPA) Clean Air and Power Division EPA Contract No. 68HERH21D0006

Introduction

This quarterly report summarizes results from the Clean Air Status and Trends Network (CASTNET) quality assurance/quality control (QA/QC) program for data collected during first quarter 2025. The various QA/QC criteria and policies are documented in the CASTNET Quality Assurance Project Plan [QAPP; WSP USA Environment & Infastructure Inc. (WSP), 2024]. The QAPP is comprehensive and includes standards and policies for all components of project operation from site selection through final data reporting. It is reviewed annually and updated as warranted.

Quarterly Summary

The QA Manager received comments from EPA on the draft CASTNET QAPP Revision 10.2 on January 13 and February 4, 2025. In addition to the changes requested by EPA, WSP updated the QAPP to include the new corporate name that WSP has adopted. WSP is in the final stages of novating all contracts with the new name. The final version of the QAPP Revision 10.2 (WSP, 2025) was submitted to EPA on March 6, 2025, and EPA approved it. After other CASTNET stakeholders completed the approval and signature process, the QAPP Revision 10.2 was uploaded to EPA's CASTNET web page (https://www.epa.gov/castnet/documents-reports#QualityAssuranceProjectPlan).

WSP's analytical and field laboratories are due for onsite assessment to renew International Organization for Standardization (ISO)/International Electrotechnical Commission (IEC) 17025:2017 accreditation by the American Association for Laboratory Accreditation (A2LA). During first quarter, WSP continued to prepare and organize documentation for the A2LA assessor. WSP answered questions and provided pre-assessment documentation to the assessor as requested. The onsite assessment is scheduled for April 14–16, 2025. The CASTNET Project Manager, Laboratory Operations Manager, QA Manager, and Field Operations Manager will meet with the assessor to answer questions and provide access to the areas to be assessed. Other CASTNET personnel will be available to meet with the assessor as requested. During the assessment, WSP will provide the assessor with office and meeting space as needed. The current ISO/IEC 17025:2017 accreditation expires May 31, 2025.

WSP continued preparations for updating CASTNET ozone transfers to the new cross-section¹. As of the end of first quarter, three CASTNET transfers, which included one Thermo 49i-PS and two Thermo 49i Level 2 traveling transfers, were updated with the new cross-section and verified following

¹ The absorption cross-section is a parameter used to determine atmospheric ozone concentrations based on the amount of light absorbed at an ultraviolet (UV) wavelength of 253.65 nanometers. The cross-section is used in UV ozone analyzers. The old cross-section value was measured by Hearn (1961). A review of all measurements of the absorption cross-section was carried out by an international group and a new consensus value was published in J.T. Hodges *et al.* (2019).

WSP USA Environment & Infrastructure Inc. - Project No. US-EI-68HERH21D0006.7470

the guidelines in EPA's 2023 Transfer Standards for Calibration of Air Monitoring Analyzers for Ozone Technical Assistance Document (EPA, 2023b). The next transfers to be updated with the new cross-section and verified following the 2023 guidelines are two Thermo 49i Level 2 traveling transfers, which are due for recertification in June 2025. WSP plans to begin updating the first onsite Level 3 ozone transfers with the new cross-section during early second quarter 2025 calibration trips.

WSP continued planning for data handling procedures for the transition to the new ozone cross-section. Beginning January 1, 2025, data from ozone systems not using the new cross-section are required to be flagged "XS." During March 2025, WSP's validation review of ozone data collected during January 2025 reached the Level 3 validation level and was prepared for submission to EPA's Air Quality System (AQS). WSP appended "XS" qualifier flags to the January 2025 ozone data for all EPA-sponsored CASTNET sites to indicate they were obtained from ozone systems that were not updated to the new cross-section. WSP submitted the flagged data to AQS.

EPA's Office of Air Quality Planning and Standards (OAQPS) is encouraging ozone monitoring organizations to transition to scrubber-free ozone transfer standards. WSP believes the best option for changing to scrubber-free transfer standards is through equipment changes over several years. WSP is evaluating potential replacement systems under Task Order 68HERH24F0336, Non-routine Maintenance and Repairs (3006). If OAQPS insists on a faster timeline to transition to scrubber-free transfers, the necessary modifications will be made to the current Level 2 transfers. However, removing the scrubbers from the current Level 2 transfers will not take place before third quarter 2025 to minimize the number of ozone-related changes implemented at the same time (i.e., new cross-section and new recertification procedure).

EPA's OAQPS finalized the AQS parameters for validated Level 3 CASTNET filter pack data. During March 2025, WSP began preparations for uploading CASTNET filter pack data to AQS. WSP is planning to update data at a few sites to the new AQS parameters, in order to develop a format for batch files. This format will be shared with Air Resource Specialists, Inc. for filter pack data from sites sponsored by the Bureau of Land Management-Wyoming State Office (BLM) and National Park Service (NPS), since WSP does not have permission to upload BLM or NPS data to AQS. Data will be backfilled on AQS for all sites starting with samples from 1990 or the site's inception date if it is after 1990.

WSP's corporate laboratory safety auditor performed a safety inspection of the CASTNET laboratories on January 23, 2025. The laboratories passed the audit. There were no findings.

WSP's corporate office agreed to sponsor a new, upgraded ion chromatograph (IC) for the analytical laboratory. Installation of the new Thermo Dionex Inuvion IC instrument was completed on January 24, 2025. Thermo provided training for WSP laboratory analysts on January 29–30, 2025. The new IC was tested and evaluated for precision and accuracy by running a method detection limit study as well as select reference samples. Additionally, previously analyzed CASTNET filter pack samples were run on the Thermo Dionex Inuvion IC and compared with the original results. The new IC began being used for routine CASTNET sample analyses on February 12, 2025. The QA Manager performed a method audit of the CASTNET standard operation procedure GLM-3180-001 with the laboratory analyst performing sample analyses using the new IC instrument to verify that the

documented method captured new details associated with the Inuvion instrument. There were new details (e.g., different software version) observed during the audit that were documented in the CASTNET QAPP Revision 10.2 (WSP, 2025).

WSP submitted analytical results of samples for proficiency test (PT) 125 for Rain and Soft Waters to the Water Science and Technology Directorate (WSTD), a branch of Environmental Science and Technology Laboratories with Environment and Climate Change Canada on January 23, 2025. Preliminary results were received from WSTD on February 17, 2025, and showed no errors or flags. Final results for PT 125 are expected in the early second quarter of 2025.

WSP sent a three-stage CASTNET filter pack to the IRL141, FL site to run on the high-flow [~20 liters per minute (LPM)] system for comparison with the standard, low-flow (1.5 LPM) CASTNET filter pack also deployed at the site, with both running on the same 7-day sampling schedule. Traditionally, only a single-stage Teflon filter has been run on the high-flow tower. Initial comparison of the standard CASTNET suite of parameters from the high-flow filter pack and the standard, low-flow CASTNET filter pack showed ammonium air concentration results were lower on the high-flow filter pack than on the low-flow filter pack.

WSP installed a low-flow, three-stage CASTNET filter pack system at the CNS011, FL site on January 29, 2025 to compare high-flow with low-flow air concentrations. The CNS011 site has been operating a high-flow, three-stage CASTNET filter pack since sampling began in August 2024.

During March 2025, WSP began analyses to compare high-flow filter pack sample results with low-flow filter pack sample results from IRL141 and CNS011 to quantify differences. Preliminary results indicate that the high-flow filter pack had lower sulfur dioxide air concentrations from the nylon and cellulose filters in addition to the lower ammonium air concentrations from the Teflon filter. The cause of these differences is not clear. WSP plans to continue running high-flow and low-flow filter pack comparisons at the IRL141 and CNS011 sites to obtain additional data as well as performing testing at the CASTNET test site in Gainesville, FL.

During first quarter 2025, a National Performance Audit Program (NPAP) audit was performed at the site listed in Table 1.

Table 2 lists the quarters of data that were validated to Level 3 during first quarter 2025 by site calibration group. Table 3 lists the sites in each calibration group along with the calibration schedule. Table 4 presents the measurement criteria for laboratory filter pack measurements. These criteria apply to the QC samples listed in the following section of this report. Table 5 presents the critical criteria for ozone monitoring. Table 6 presents the critical criteria for trace-level gas monitoring.

Quality Control Analysis Count

The QC sample statistics presented in this report are for reference standards (RF) and continuing calibration verification spikes (CCV) used to assess accuracy and for replicate sample analyses (RP) used to assess "in-run" precision. In addition, laboratory method blanks (MB) containing reagents without a filter; laboratory blanks (LB) containing reagents and a new, unexposed filter; and field blanks (FB) containing reagents and an unexposed filter that was loaded into a filter pack assembly

and shipped to and from the monitoring site while remaining in sealed packaging are also included. Table 7 presents the number of analyses in each category that were performed during first quarter 2025.

Sample Receipt Statistics

Ninety-five percent of field samples from EPA-sponsored sites must be received by the CASTNET laboratory in Gainesville, FL no later than 14 days after removal from the sampling tower. Table 8 presents the relevant sample receipt statistics for first quarter 2025.

Data Quality Indicator (DQI) Results

Figures 1 through 3 present the results of RF, CCV, and RP QC sample analyses for first quarter 2025. All results were within the criteria listed in Table 4.

Table 9 presents summary statistics of critical criteria measurements at ozone sites collected during first quarter 2025. The statistics presented contain data validated at Level 2 and Level 3. All data associated with QC checks that fail to meet the criteria listed in Table 5 were or will be invalidated unless the cause of failure has no effect on ambient data collection, and passing results still meet frequency criteria. Results in shaded cells either exceed documented criteria or are otherwise notable. Table 10 presents observations associated with the shaded cell results in Table 9.

Table 11 presents summary statistics of critical criteria measurements at trace-level gas monitoring sites collected during first quarter 2025. The statistics presented contain data validated at Level 2 and Level 3. All data associated with QC checks that fail to meet the criteria listed in Table 6 were or will be invalidated unless the cause of failure has no effect on ambient data collection, and passing results still meet frequency criteria. Results in shaded cells either exceed documented criteria or are otherwise notable. During first quarter, no values exceeded documented criteria or were otherwise notable.

Laboratory Control Sample Analysis

The laboratory control sample (LCS) is a reagent blank spiked with the target analytes from the established analytical methods and carried through the same extraction process that field samples must undergo. LCS analyses are performed by the laboratory to monitor for potential sample handling artifacts and provide a means to identify possible analyte loss from the extraction process. Figure 4 presents LCS analysis results for first quarter 2025. All recovery values were between 83 percent and 105 percent. The recovery values for cellulose filters dropped from 103 percent on February 1, 2025 to 83 percent on March 26, 2025. Two LCS have been prepared and analyzed in April with no changes to solutions or procedures with recoveries at 91 and 92 percent. The laboratory is investigating these results.

Blank Results

Figures 5 through 7 present the results of MB, LB, and FB QC sample analyses for first quarter 2025. All first quarter results were within criteria (two times the reporting limit) listed in Table 4.

Suspect/Invalid Filter Pack Samples

Filter pack samples that were flagged as suspect or invalid during first quarter 2025 are listed in Table 12. This table also includes associated site identification and a brief description of the reason the sample was flagged. During first quarter, nine filter pack samples were invalidated.

Field Problem Count

Table 13 presents counts of field problems affecting continuous data collection for more than one day for first quarter 2025. The problem counts are sorted by a 30-, 60-, or 90-day time period to resolution. A category for unresolved problems is also included.

References

- American Society for Testing and Materials (ASTM). 2022. ASTM E29-22, Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications. ASTM International, West Conshohocken, PA, DOI:10.1520/E0029-22. www.astm.org.
- Hearn, A. G. 1961. Absorption of Ozone in Ultra-violet and Visible Regions of Spectrum, *Proc. Phys.* Soc. 78 932. https://doi.org/10.1088/0370-1328/78/5/340.
- Hodges, J. T., Viallon, J., Brewer, P. J., Drouin, B. J., Gorshelev, V., Janssen, C., Lee, S., Possolo,
 A., Smith, M. A. H., Walden, J., and Wielgosz, R. I. 2019. Recommendation of a Consensus
 Value of the Ozone Absorption Cross-section at 253.65 nm based on a Literature Review, *Metrologia*, 56, 034001. https://doi.org/10.1088/1681-7575/ab0bdd.
- U.S. Environmental Protection Agency (EPA). 2023a. Title 40 Code of Federal Regulations Part 58, Appendix A to Part 58 – Quality Assurance Requirements for Monitors used in Evaluations of National Ambient Air Quality Standards. https://www.epa.gov/amtic/ambient-air-monitoringquality-assurance (Accessed April 2025).
- U.S. Environmental Protection Agency (EPA). 2023b. Transfer Standards for Calibration of Air Monitoring Analyzers for Ozone Technical Assistance Document. Publication No. EPA-454/B-22-003, January 2023: https://www.epa.gov/system/files/documents/2023-11/o3 tad 508 20230906 final.pdf (Accessed April 2025).
- WSP USA Environment & Infrastructure Inc. (WSP). 2025. Clean Air Status and Trends Network (CASTNET) Quality Assurance Project Plan (QAPP) Revision 10.2. Prepared for U.S. Environmental Protection Agency (EPA), Office of Air and Radiation, Clean Air and Power Division, Washington, DC. Contract No. 68HERH21D0006. Gainesville, FL. https://www.epa.gov/castnet/documents-reports (Accessed April 2025).
- WSP USA Environment & Infrastructure Inc. (WSP). 2024. Clean Air Status and Trends Network (CASTNET) Quality Assurance Project Plan (QAPP) Revision 10.1. Prepared for U.S. Environmental Protection Agency (EPA), Office of Air and Radiation, Clean Air and Power Division, Washington, DC. Contract No. 68HERH21D0006. Gainesville, FL. https://www.epa.gov/castnet/documents-reports (Accessed April 2025).

Table 1 NPAP and State Agency Audits of CASTNET Ozone Systems

Site ID	Auditing Agency
LPO010, CA	NPAP (EPA Region 9)

Table 2 Data Validated to Level 3 through First Quarter 2025

Calibration Group*	Months Available	Number of Months	Complete Quarters	Number of Quarters
E-3/W-10 [†]	May 2024– October 2024	6	Quarter 3 2024	1
SE-4/MW-6 [‡]	July 2024– December 2024	6	Quarter 3 2024– Quarter 4 2024	2

Notes: * The sites contained in each calibration group are listed in Table 3.

† Contains ROM206 of the ROM406/ROM206 co-located pair

‡ Contains MCK131/231 co-located pair

Table 3 Field Calibration Schedule for 2025

Calibration Group	Months Calibrated	Sites Calibrated					
	Eastern Sites (17 Total)						
E-1 (7 Sites)	February/August	ARE128, PA PED108, VA	BEL116, MD VPI120, VA	BWR139, MD WSP144, NJ	CTH110, NY		
E-2 (6 Sites)	April/October	ABT147, CT WFM105, NY	CAT175, NY WST109, NH	EGB181, ON	NIC001, NY		
E-3 (4 Sites)	May/November	KEF112, PA	LRL117, PA	MKG113, PA	PAR107, WV		
	Southeastern Sites (12 Total)						
SE-4 (7 Sites)	January/July	BFT142, NC GAS153, GA	CND125, NC SND152, AL	COW137, NC SPD111, TN	DUK008, NC ¹		
SE-5 (5 Sites)	February/August	CAD150, AR SUM156, FL	CNS011, FL	CVL151, MS	IRL141, FL		
		Midwester	n Sites (15 Total)				
MW-6 (4 Sites)	January/July	CKT136, KY	ESP127, TN	MCK131, KY	MCK231, KY		
MW-7 (7 Sites)	March/September	BVL130, IL ² RED004, MN	OXF122, OH STK138, IL ²	PRK134, WI VIN140, IN	QAK172, OH		
MW-8 (4 Sites)	April/October	ANA115, MI	HOX148, MI	SAL133, IN	UVL124, MI		
	Western Sites (13 Total)						
W-9 (5 Sites)	March/September	ALC188, TX SAN192, NE ²	CHE185, OK	HAS012, KS	KNZ184, KS		
W-10 (8 Sites)	May/November	CNT169, WY PAL190, TX	GTH161, CO PND165, WY	LPO010, CA ROM206, CO	NPT006, ID UMA009, WA		

Notes: ¹ Trace-level gas calibrations are performed quarterly in January, April, July, and October.

² Trace-level gas calibrations are performed quarterly in March, June, September, and December.

Table 4 Data Quality Indicators for CASTNET Laboratory Measurements

		Precision ¹	Accuracy ²	Nominal Rep	orting Limits ³
Analyte	Method	(MARPD)	(%)	mg/L	µg/Filter
Ammonium (NH_4^+)	AC	20	90-110	0.020*	0.5
Sodium (Na [⁺])	ICP-OES	20	95-105	0.005	0.125
Potassium ($K^{^+}$)	ICP-OES	20	95-105	0.006	0.15
Magnesium (Mg ²⁺)	ICP-OES	20	95-105	0.003	0.075
Calcium (Ca ²⁺)	ICP-OES	20	95-105	0.006	0.15
Chloride (Cl ⁻)	IC	20	95-105	0.020	0.5
Nitrate (NO ₃)	IC	20	95-105	0.008*	0.2
Sulfate (SO ₄ ²⁻)	IC	20	95-105	0.040	1.0

Notes: ¹ This column lists precision goals for both network precision calculated from co-located filter samples and laboratory precision based on replicate samples for samples > five times the reporting limit. The criterion is ± the reporting limit if the sample is ≤ five times the reporting limit.

² This column lists laboratory accuracy goals based on reference standards and continuing calibration verification spikes. The criterion is 90–110 percent for ICP-OES reference standards.

³ The reporting limit for sulfate on cellulose filters is 0.080 mg/L (2.0 µg/filter).

AC = IC = ICP-OES =	automated colorimetry ion chromatography inductively counted plasma-optical emission spectrometry
MARPD =	mean absolute relative nercent difference
ma/l =	milligrams per liter
ug/Filter =	micrograms per filter
* =	as nitrogen

Values are rounded according to American Society for Testing and Materials (ASTM) E29-22, "Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications" (ASTM, 2022).

For more information on analytical methods and associated precision and accuracy criteria, see the CASTNET QAPP (WSP, 2024).

Table 5 Ozone Critical Criteria*

Type Check	Analyzer Response
Zero	Less than ± 3.1 ppb
Span	Less than ± 7.1 percent between supplied and observed concentrations
Single Point QC	Less than ± 7.1 percent between supplied and observed concentrations

Notes: * Applies to CASTNET sites that are configured and operated in accordance with Part 58 of Title 40 of the *Code of Federal Regulations* (EPA, 2023a). The minimum frequency for these checks is once every two weeks.

Values are rounded according to ASTM E29-22, "Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications" (ASTM, 2022).

ppb = parts per billion

Table 6 Trace-level Gas Monitoring Critical Criteria*

	Analyzer Response			
Parameter	Zero Check	Span Check / Single Point QC Check		
SO ₂	Less than ± 1.51 ppb	Less then 1.10.1 nereest between sumplied and		
NOy	Less than ± 1.51 ppb	Less than ± 10.1 percent between supplied and		
CO	Less than ± 50 ppb			

Notes: *Applies to CASTNET sites that are configured and operated in accordance with Part 58 of Title 40 of the Code of Federal Regulations (EPA, 2023a). The minimum frequency for these checks is once every two weeks.

Values are rounded according to ASTM E29-22, "Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications" (ASTM, 2022).

SO₂ = sulfur dioxide

NO_y = total reactive oxides of nitrogen

CO = carbon monoxide

ppb = parts per billion

Table 7 QC Analysis Count for First Quarter 2025

Filter Type	Parameter	RF Sample Count	CCV Sample Count	RP Sample Count	MB Sample Count	LB Sample Count	FB Sample Count
Teflon	SO ₄ ²⁻	67	193	81	16	24	90
	NO ₃	67	193	81	16	24	90
	NH_4^+	32	167	75	16	24	90
	CI	67	193	81	16	24	90
	Ca ²⁺	33	169	77	16	24	90
	Mg ²⁺	33	169	77	16	24	90
	Na [⁺]	33	169	77	16	24	90
	K⁺	33	169	77	16	24	90
Nylon	SO ₄ ²⁻	36	155	67	12	24	90
	NO ₃	36	155	67	12	24	90
Cellulose	SO ₄ ²⁻	23	51	20	8	24	26

Table 8 Filter Pack Receipt Summary for First Quarter 2025

Count of samples received more than 14 days after removal from tower:	24
Count of all samples received:	694
Fraction of samples received within 14 days:	0.965
Average interval in days:	5.667
First receipt date:	01/02/2025
Last receipt date:	03/27/2025

Note: Sample shipments for the Egbert, Ontario site (EGB181) are sent in groups of four. Samples associated with EGB181 are excluded from this statistic.

Table 9 Ozone QC Summary for First Quarter 2025 (1 of 2)

			% Single			Zero
Site ID	% Span	Spap [0/ D12	Point QC	Single Point	% Zero	Average
	Pass	Span [%D] ²	Pass		Pass	(ppb) ²
ABT147, CT	100.00	0.67	100.00	0.49	100.00	0.16
ALC188, TX	100.00	1.74	100.00	1.40	100.00	0.38
ANA115, MI	88.66	13.85	88.66	14.13	100.00	0.26
ARE128, PA	100.00	0.91	100.00	1.70	100.00	0.64
BEL116, MD	97.56	3.74	100.00	2.42	100.00	0.72
BFT142, NC	100.00	2.71	100.00	3.11	100.00	0.33
BVL130, IL	92.47	9.05	92.39	9.04	100.00	0.15
BWR139, MD	100.00	1.51	98.89	2.63	100.00	0.52
CAD150, AR	100.00	0.81	100.00	0.90	100.00	0.30
CKT136, KY	100.00	0.94	100.00	1.02	100.00	0.11
CND125, NC	100.00	1.32	100.00	1.65	100.00	0.40
CNT169, WY	100.00	0.71	100.00	1.05	100.00	0.22
COW137, NC	87.50	13.55	87.50	14.49	100.00	0.78
CTH110, NY	100.00	0.57	100.00	1.50	100.00	0.40
CVL151, MS	100.00	2.53	100.00	2.69	100.00	0.16
DUK008, NC	89.01	11.44	89.01	11.74	100.00	0.61
ESP127, TN	92.59	4.09	91.46	4.50	100.00	0.60
GAS153, GA	100.00	0.91	100.00	1.44	100.00	0.55
GTH161, CO	100.00	1.72	100.00	2.42	100.00	0.38
HAS012, KS	100.00	0.89	100.00	1.08	100.00	0.41
HOX148, MI	100.00	0.83	100.00	1.11	100.00	0.19
IRL141, FL	95.83	4.38	95.83	2.40	97.18	1.53
KEF112, PA	93.68	4.68	92.63	5.72	92.63	3.04
LPO010, CA	75.58	24.91	75.29	25.41	100.00	0.16
LRL117, PA	98.94	1.21	100.00	0.80	100.00	0.28
MCK131, KY	92.63	2.83	90.53	3.07	100.00	0.27
MCK231, KY	100.00	1.05	100.00	0.90	100.00	0.15
MKG113, PA	100.00	1.31	100.00	1.83	100.00	0.29
NPT006, ID	97.47	1.02	100.00	1.30	100.00	0.11
OXF122, OH	100.00	2.97	92.00	4.51	100.00	0.29
PAL190, TX	100.00	4.45	100.00	3.44	100.00	0.34
PAR107, WV	100.00	0.73	100.00	0.60	100.00	0.27
PED108, VA	85.26	2.28	91.58	2.49	100.00	0.70
PND165, WY	100.00	2.56	100.00	2.37	100.00	0.37
PRK134, WI	94.62	5.46	95.70	4.26	97.85	0.98
PSU106, PA	95.79	4.00	95.79	2.77	95.79	1.66
QAK172. OH	100.00	1.26	100.00	0.91	100.00	0.27
ROM206, CO	91.58	8.83	91.58	9.13	100.00	0.27
SAL133, IN	97.83	2.05	97.83	4.86	100.00	0.13
SAN192 NE	100.00	1.78	100.00	2.46	100.00	0.60
SND152 AI	100 00	3.39	100.00	3.26	100.00	0.29
SPD111 TN	100.00	0.92	100.00	0.77	100.00	0.22
STK138. IL	92.00	4.35	97.80	4.03	100.00	0.34

Table 9 Ozone QC Summary for First Quarter 2025 (2 of 2)

Site ID	% Span Pass ¹	Span [%D]²	% Single Point QC Pass ¹	Single Point QC [%D] ²	% Zero Pass¹	Zero Average (ppb)²
SUM156, FL	92.71	3.29	75.27	3.73	98.94	0.42
UMA009, WA	100.00	1.03	100.00	1.28	98.82	0.54
UVL124, MI	100.00	0.78	100.00	0.62	100.00	0.22
VIN140, IN	100.00	1.51	100.00	2.19	100.00	0.19
VPI120, VA	100.00	1.32	100.00	1.49	100.00	0.17
WSP144, NJ	100.00	1.55	100.00	1.17	100.00	0.42
WST109, NH	100.00	0.53	100.00	0.88	100.00	0.78

Notes: ¹Percentage of comparisons that pass the criteria listed in Table 5. Values falling below 90 percent are addressed in Table 10. ²Absolute value of the average percent differences between the on-site transfer standard and the site monitor. Values exceeding the criteria listed in Table 5 are addressed in Table 10.

%D = percent difference

ppb = parts per billion

Table 10 Ozone QC Observations for First Quarter 2025

Site ID	QC Criterion	Comments
ANA115, MI	% Span Pass Span %D % Single Point QC Pass Single Point QC %D	Analyzer pump failed 2/6/2025 and was replaced 2/12/2025.
BVL130, IL	Span %D Single Point QC %D	Analyzer pump failed 1/4/2025 and was replaced 1/8/2025.
COW137, NC	% Span Pass Span %D % Single Point QC Pass Single Point QC %D	Analyzer pump failed 2/28/2025 and was replaced 3/6/2025.
DUK008, NC	% Span Pass Span %D % Single Point QC Pass Single Point QC %D	Analyzer pump failed 2/20/2025 and was replaced 2/25/2025.
LPO010, CA	% Span Pass Span %D % Single Point QC Pass Single Point QC %D	Site power failure from 1/7/2025 to 1/17/2025. In addition, the analyzer pump failed 2/8/2025 and was replaced 2/18/2025.
PED108, VA	% Span Pass	Analyzer malfunction affected data from 1/1/2025 to 1/7/2025.
ROM206, CO	Span %D Single Point QC %D	Analyzer sample pump failed 1/10/2025 and was replaced 1/14/2025.
SUM156, FL	% Single Point QC Pass	Analyzer malfunction affected data from 1/1/2025 to 1/16/2025.

Note: %D = percent difference

Parameter	% Span Pass ¹	Span [%D]²	% Single Point QC Pass ¹	Single Point QC [%D] ²	% Zero Pass¹	Zero Average (ppb)²	
BVL130, IL							
SO ₂	93.75	8.11	93.75	7.20	100.00	0.49	
NOy	97.92	6.24	100.00	5.60	97.92	0.25	
CO	100.00	2.37	100.00	3.28	100.00	12.33	
DUK008, NC							
NOy	100.00	2.30	100.00	1.95	100.00	0.19	
SAN192,							
NOy	100.00	2.49	97.73	2.82	95.45	0.54	
STK138, IL							
NOy	100.00	2.70	100.00	3.27	91.11	0.73	

Table 11 Trace-level Gas QC Summary for First Quarter 2025

Notes: ¹Percentage of comparisons that pass the criteria listed in Table 6. Values falling below 90 percent are addressed in Table 12. ²Absolute value of the average percent differences between the supplied and observed concentrations.

%D = percent difference

ppb = parts per billion

Table 12 Filter Packs Flagged as Suspect or Invalid During First Quarter 2025

Site ID	Sample No.	Reason	
ALB801, AB	2505007-01	Flow data from 2/1/25 forward are not currently in the Level 2 data table.	
BEL116, MD	2505001-03	Power failure	
BUF603, WY	2505005-02	Flow data from 2/1/25 forward are not currently in the Level 2 data table.	
CAT175, NY	2502001-08	Communication issue required replacement of the	
	2503001-08	modem and site batteries.	
	2504001-08		
FOR605, WY	2505005-03	Flow data from 2/1/25 forward are not currently in the Level 2 data table.	
NEC602, WY	2505005-04	Flow data from 2/1/25 forward are not currently in the Level 2 data table.	
WST109, NH	2505001-49	Flow channel left down during filter change. Five- minute averaged data are available. This sample should be recovered during Level 3 data validation.	

Table 13 Field Problems Affecting Data Collection

Days to Resolution	Problem Count		
30	223		
60	8		
90	2		
Unresolved by end of quarter	10		

Analysis Date

Figure 1 Reference Standard Results for First Quarter 2025 (percent recovery)



Analysis Date

Figure 2 Continuing Calibration Spike Results for First Quarter 2025 (percent recovery)









Figure 4 Laboratory Control Sample Results for First Quarter 2025 (percent recovery)



Figure 5 Method Blank Analysis Results for First Quarter 2025 (total micrograms)



Analysis Date

Figure 6 Laboratory Blank Analysis Results for First Quarter 2025 (total micrograms)



Analysis Date

1/1/2025

Figure 7 Field Blank Analysis Results for First Quarter 2025 (total micrograms)



1/1/2025

1/25/202

Analysis Date

Analysis Date

4/202