



Community Air Monitoring Plan

Perimeter Air Quality Monitoring Program

Prepared for:

Fort Mill School District

2233 Deerfield Drive, Fort Mill, South Carolina 29715

Site:

Flint Hill Elementary School

392 Gold Hill Road, Fort Mill, South Carolina 29715

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Air Sampling & Monitoring, Emergency Preparedness,
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Community Air Monitoring Plan

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Glossary of Key Terms

The following terms and abbreviations are used throughout this document. This glossary is provided as a reference to support understanding of the technical content that follows.

Aeroqual Cloud: The secure, web-based data management platform used to store, display, and analyze air quality data collected by the Aeroqual AQS 1 monitoring stations. Authorized Citadel and District personnel can access real-time dashboards, historical data, and automated alert notifications through this platform.

AIHA: American Industrial Hygiene Association. A professional organization that sets guidelines for safe indoor and outdoor air quality, including recommended TVOC levels.

Ambient Air: That portion of the atmosphere, external to buildings, to which the general public has access, as defined under the federal environmental regulations governing National Ambient Air Quality Standards (40 CFR 50.1 (e)). In the context of this monitoring program, ambient air refers to the outdoor air surrounding the school campus and adjacent areas that is continuously sampled by the perimeter monitoring stations.

AQS: Air Quality Station. The Aeroqual AQS 1 is the configurable outdoor monitoring platform used in this program for simultaneous measurement of particulate matter and gaseous pollutants.

Attainment/Nonattainment: Designations assigned by the U.S. EPA to geographic areas based on whether they meet the National Ambient Air Quality Standards (NAAQS) for criteria pollutants. An area in attainment meets the standard; an area in nonattainment does not, and is subject to additional regulatory requirements to improve air quality.

Baseline Monitoring: The process of measuring air quality before a potential source of emissions begins full operations, establishing a reference point for future comparison.

Baseline Drift / Instrument Drift: A gradual change in a sensor's readings over time, unrelated to actual changes in air quality. Drift can be caused by environmental exposure, component aging, or contamination of the sensing element. Regular calibration corrects for drift and ensures continued measurement accuracy.

bkgd: Background. Refers to the ambient concentration of a substance normally present in outdoor air, independent of any specific emission source.

°C: Degrees Celsius. A unit of measurement for temperature used in weather station specifications.

CAA (Clean Air Act): The primary federal law governing air quality in the United States, originally enacted in 1970 and significantly amended in 1977 and 1990. The Clean Air Act authorizes the U.S. EPA to establish National Ambient Air Quality Standards (NAAQS), regulate emissions from stationary and mobile sources, and enforce compliance with air quality requirements.

CalEPA DTSC: California Environmental Protection Agency, Department of Toxic Substances Control. Publisher of the Community Air Monitoring Plan Guidance (January 2020) used as a structural reference for this CAMP.

CAMP: Community Air Monitoring Plan. A perimeter air monitoring protocol that defines monitoring parameters, action levels, and response procedures. The NYSDEC DER-10, Appendix 1A establishes one of the most widely referenced CAMP frameworks in the United States.

CASAC: Clean Air Scientific Advisory Committee. An independent committee of scientists established under the Clean Air Act to advise the U.S. EPA Administrator on the scientific basis for the National Ambient Air Quality Standards (NAAQS), including the adequacy of existing standards and the need for revisions.

CDPH: Certified Disaster Preparedness and Homeland Security Professional. A professional certification demonstrating expertise in emergency preparedness, disaster response planning, and homeland security principles.

CH₄: Methane. A colorless, odorless gas naturally present in outdoor air at approximately 2 ppm. Monitored continuously in this program as an indicator of combustible gas conditions.

CHMM: Certified Hazardous Materials Manager. A professional certification granted by the Institute of Hazardous Materials Management, demonstrating expertise in the management, handling, and regulatory compliance of hazardous materials and environmental programs.

CIH: Certified Industrial Hygienist. A professional certification granted by the American Board of Industrial Hygiene, requiring demonstrated expertise and adherence to strict ethical standards.

COPCs: Chemicals of Potential Concern. Substances identified as having the potential to be present in the air near the school campus and warranting inclusion in the monitoring program.

CFR: Code of Federal Regulations. The official compilation of all federal rules and regulations published by the executive departments and agencies of the United States government. Environmental regulations, including the National Ambient Air Quality Standards (NAAQS), are found in Title 40 (Protection of the Environment).

DER-10: Division of Environmental Remediation Technical Guidance for Site Investigation and Remediation. A guidance document published by the NYSDEC that includes Appendix 1A, the Community Air Monitoring Plan, which establishes VOC and particulate matter action levels for perimeter monitoring.

EPA (U.S. EPA): United States Environmental Protection Agency. The federal agency responsible for establishing and enforcing environmental regulations, including the National Ambient Air Quality Standards (NAAQS).

ESG: Environmental, Social, and Governance. A framework used to evaluate an organization's practices and performance related to environmental stewardship, social responsibility, and corporate governance.

°F: Degrees Fahrenheit. A unit of measurement for temperature used in baseline meteorological data reporting.

Field Blanks: Unused sampling media (such as filters or collection tubes) that are opened and resealed at the monitoring site without collecting a sample, then submitted to the laboratory for analysis alongside actual samples. Field blanks are used as a quality control measure to confirm that no contamination was introduced during sample handling, transport, or storage.

GSS: Gas Sensitive Semiconductor. A type of sensor technology used in the methane monitoring module to detect combustible gases.

hPa: Hectopascals. A unit of measurement for barometric (atmospheric) pressure.

IPX6: An international rating that indicates a device is protected against powerful water jets from any direction. In this program, the IPX6 rating applies to the AirMar 200WX weather station, confirming it is designed to operate reliably in outdoor weather conditions including heavy rain.

LEED AP: Leadership in Energy and Environmental Design, Accredited Professional. A professional credential administered by the U.S. Green Building Council, demonstrating expertise in green building design, construction, and sustainability practices.

Living Document: A document that is intended to be revised and updated on an ongoing basis as new information, data, or operational conditions become available, rather than remaining fixed after its initial publication.

m/s: Meters per second. A unit of measurement for wind speed.

MAE: Mean Absolute Error. A statistical measure of the average difference between sensor readings and a reference instrument, used to evaluate sensor accuracy.

mg/m³: Milligrams per cubic meter. A unit of measurement for airborne particulate or gas concentrations; 1 mg/m³ equals 1,000 µg/m³.

µm (Micrometers): A unit of length equal to one millionth of a meter. Used in this program to describe the size of airborne particles; for example, PM2.5 refers to particles 2.5 micrometers or smaller in diameter, roughly 30 times smaller than the width of a human hair.

mph: Miles per hour. A unit of measurement for wind speed used in baseline meteorological data reporting.

NAAQS: National Ambient Air Quality Standards. Federal air quality standards set by the U.S. EPA under the Clean Air Act, designed to protect public health, including the health of sensitive populations such as children and individuals with respiratory conditions.

NIOSH: National Institute for Occupational Safety and Health. A federal agency that develops exposure limits and analytical methods for workplace and environmental air monitoring.

NIST: National Institute of Standards and Technology. A federal agency that establishes measurement standards used to ensure the accuracy and traceability of calibration equipment.

NOAA: National Oceanic and Atmospheric Administration. A federal agency that provides scientific data on atmospheric and environmental conditions, including global methane concentration monitoring.

NYSDEC: New York State Department of Environmental Conservation. The state agency that published the DER-10 technical guidance, including the Community Air Monitoring Plan framework adopted as a reference for this program.

Optical Particle Counter: A type of sensor that measures airborne particulate matter by drawing air through a beam of light and detecting the light scattered by individual particles. The size and number of particles are determined by the intensity and pattern of the scattered light. The Aeroqual PCX module uses this technology to measure PM_{2.5} and PM₁₀.

OSHA: Occupational Safety and Health Administration. A federal agency that establishes and enforces workplace safety and health standards, including permissible exposure limits for airborne contaminants.

PID: Photoionization Detector. A type of gas sensor used to measure volatile organic compounds by ionizing gas molecules with ultraviolet light.

PM_{2.5} and PM₁₀: Fine particles in the air measured in micrometers (μm). PM_{2.5} particles are 2.5 micrometers or smaller; PM₁₀ particles are 10 micrometers or smaller. Both are measured in micrograms per cubic meter (μg/m³).

ppm / ppb: Parts per million / parts per billion. Units of measurement used to express airborne concentrations of volatile organic compounds and methane. One ppm equals one unit of a substance per million units of air; one ppb equals one-thousandth of one ppm.

PV Cell: Photovoltaic Cell. A device that converts sunlight into electricity. The adjacent Silfab Solar facility manufactures PV cells for solar panels.

Pyrophoric: A term describing a substance that ignites spontaneously when exposed to air at or below 130 degrees Fahrenheit (54 degrees Celsius) without an external ignition source such as a spark or flame. Silane (SiH₄), one of the chemicals of potential concern associated with the adjacent Silfab Solar manufacturing facility, is a pyrophoric gas.

QA/QC: Quality Assurance / Quality Control. Systematic procedures used to ensure the accuracy, reliability, and consistency of monitoring data, including calibration, data review, and recordkeeping.

R² (Coefficient of Determination): A statistical measure, expressed as a value between 0 and 1, that indicates how closely a sensor's readings match those of a reference instrument. An R² value of 1.0 indicates perfect agreement; values above 0.90 are generally considered strong. In this program, R² values are used to validate the accuracy of field-deployed sensors against laboratory-grade reference instruments.

RH: Relative Humidity. The amount of moisture in the air expressed as a percentage of the maximum moisture the air can hold at a given temperature.

Rolling Average: A calculation method that continuously updates by averaging data over a set time window (such as 15 minutes or 24 hours), providing a more representative picture of overall conditions.

RLs: Regional Screening Levels. Health-based screening concentrations published by the U.S. EPA for contaminants in air, used to evaluate whether detected concentrations warrant further investigation.

SCAQMD: South Coast Air Quality Management District. The air quality regulatory agency for the greater Los Angeles area. SCAQMD Rule 403 establishes requirements for fugitive dust control, including PM10 thresholds used in perimeter monitoring programs.

SCDHEC: South Carolina Department of Health and Environmental Control. The state agency responsible for environmental regulation and public health protection in South Carolina.

SCGs: Standards, Criteria, and Guidance. A collective term used by the New York State Department of Environmental Conservation (NYSDEC) to refer to the body of environmental standards, regulatory criteria, and technical guidance documents used to evaluate contamination levels and determine appropriate cleanup actions at remediation sites.

SCP: Safety and Compliance Professional. A professional certification demonstrating expertise in occupational safety, environmental compliance, and regulatory standards.

Shelter-in-Place: A protective action in which building occupants remain indoors, close all windows and doors, and shut down ventilation systems to reduce exposure to airborne contaminants or other outdoor hazards. In the context of this program, shelter-in-place is one of several protective measures that may be recommended by emergency management officials if monitoring data indicate a significant air quality event.

SiH₄ (Silane): Silane. A pyrophoric gas that ignites spontaneously on contact with air, used in solar cell manufacturing processes. Stored in large quantities at the adjacent Silfab Solar facility and identified as a chemical of potential concern.

SMS: Short Message Service (text message). Used in this program for automated alert notifications sent to Citadel personnel when monitoring thresholds are approached or exceeded.

TAPs: Toxic Air Pollutants. South Carolina's regulatory standards for toxic air pollutant concentrations, established under Regulation 61-62.5, Standard No. 8.

Temporal Resolution: The frequency at which a monitoring instrument records measurements. Higher temporal resolution means more frequent readings, providing a more detailed picture of how conditions change over time. In this program, the monitoring stations record data at one-minute intervals, which is considered high temporal resolution for ambient air monitoring.

Tracer Gas: A gas used as an indirect indicator of the presence of other gases that may be difficult to detect directly. In this program, methane serves as a tracer gas for other combustible and flammable gases, including silane; an unexpected change in methane sensor readings that does

not correlate with known methane sources could indicate the presence of another combustible gas warranting investigation.

TVOCs: Total Volatile Organic Compounds. A broad category of carbon-based chemicals that evaporate easily at room temperature.

µg/m³: Micrograms per cubic meter. A unit of measurement for particulate matter in air.

Upwind/Downwind: Upwind refers to the direction from which the wind is blowing; downwind is the direction toward which the wind is blowing. In this program, the upwind monitor measures air approaching the campus, while the downwind monitor measures air that has passed over or near the area between the school and the Silfab Solar manufacturing facility.

Zero-Air: Purified air that has been filtered to remove all detectable contaminants, used as a reference standard during sensor calibration. By exposing a sensor to zero-air, technicians can verify that the instrument reads zero in the absence of the target pollutant and adjust for any offset.

1.0 Purpose and Scope

This Community Air Monitoring Plan (CAMP) establishes the operational framework for the continuous perimeter air quality monitoring program at Flint Hill Elementary School in Fort Mill, South Carolina. It is a companion document to the Perimeter Air Monitoring Baseline Report (Citadel Project No. 2732.1002.0), which presents the pre-operational air quality data collected during February 2026.

The CAMP defines the monitoring equipment, alert and action thresholds, response procedures, data management practices, and quality assurance protocols that govern the ongoing monitoring program. It is intended to serve as a living document; Citadel EHS (Citadel) will review and update it as additional operational data become available and as conditions at the adjacent Silfab Solar manufacturing facility evolve.

1.1 Elective and Proactive Monitoring

This monitoring program was initiated at the direction of the Fort Mill School District (the District) and is funded entirely by the District. It is important to understand that this program is elective and proactive. It was not established in response to a regulatory requirement, a compliance obligation, or an enforcement action. No federal, state, or local regulation requires the District to conduct perimeter air monitoring at its school campuses.

The District chose to implement this program given the Silfab Solar Photovoltaic Cell (PV Cell) manufacturing facility, located approximately 1,300 feet north from the Flint Hill Elementary and Middle School campuses, will store and use industrial chemicals and gases as part of its solar panel manufacturing operations. The District determined that independent, third-party environmental monitoring was the most responsible way to provide its community with objective, science-based information about the air their children breathe while at school.

While this CAMP draws on established regulatory frameworks and industry best practices for its structure and technical approach, including guidance from the California Environmental Protection Agency (CalEPA) Department of Toxic Substances Control (DTSC), the New York State Department of Environmental Conservation (NYSDEC) DER-10, and the U.S. Environmental Protection Agency (EPA), it is not written to satisfy any specific regulatory requirement. The monitoring standards and thresholds described in this plan are intentionally conservative, chosen to protect health rather than to meet a minimum compliance standard.

1.2 Structural References

The structure of this CAMP is informed by the CalEPA DTSC Community Air Monitoring Plan Guidance (January 2020), which provides a widely recognized framework for community air monitoring programs near sites with potential airborne contaminants. Additionally, the alert and action thresholds described in Section 5.0 incorporate elements from the NYSDEC DER-10, Appendix 1A (Community Air Monitoring Plan), which establishes one of the most technically rigorous perimeter monitoring frameworks in the United States.

2.0 Project and Site Description

2.1 Site Location and Setting

Flint Hill Elementary School is located at 392 Gold Hill Road in the City of Fort Mill, York County, South Carolina 29715. The school is part of the Fort Mill School District, which serves more than 18,000 students and employs approximately 2,500 staff across its campuses.

The Silfab Solar PV Cell manufacturing facility is situated approximately 1,300 feet to the north of the Flint Hill Elementary and Middle School. The facility is designed to manufacture photovoltaic (solar) panels, a process that involves the use and storage of several industrial chemicals and gases.

2.2 Chemicals of Potential Concern

Citadel previously developed an Air Quality Monitoring Plan (Citadel Project No. 2732.1001.0, July 2025) for the District, which identified a set of Chemicals of Potential Concern (COPCs) based on a thorough review of publicly available documentation related to the Silfab Solar manufacturing facility. These COPCs represent substances that have the potential to be present in the air near the school campus and warrant inclusion in the monitoring program.

A full description of each COPC, including its physical form, health relevance, and sampling methodology, is provided in the Air Quality Monitoring Plan (Citadel Project No. 2732.1001.0). Of the identified COPCs, four are monitored continuously at the perimeter stations as part of this CAMP: particulate matter (PM_{2.5} and PM₁₀), total volatile organic compounds (TVOCs), and methane (CH₄). These parameters were selected for continuous monitoring because they can be reliably measured in real time using field-deployed sensors and serve as effective indicators of potential changes in ambient air quality near the school campus. The following section describes each continuously monitored parameter and the rationale for its inclusion. The following section describes each continuously monitored parameter and the rationale for its inclusion.

2.3 Continuously Monitored Parameters

The continuous perimeter monitoring system tracks the following parameters at both the upwind and downwind stations. Parameter concentrations are expressed in micrograms per cubic meter (µg/m³) for particulate matter, and in parts per million (ppm) or parts per billion (ppb) for volatile organic compounds and methane:

- **Particulate Matter (PM_{2.5} and PM₁₀):** Fine particles in the air that can be inhaled. PM_{2.5} (2.5 micrometers or smaller) can penetrate deep into the lungs; PM₁₀ (10 micrometers or smaller) can be inhaled. Common sources include dust, vehicle exhaust, construction, and combustion.
- **Total Volatile Organic Compounds (TVOCs):** A broad category of carbon-based chemicals that evaporate easily. Sources include but are not limited to paints, cleaning products, building materials, vehicle exhaust, and industrial processes.
- **Methane (CH₄):** A colorless, odorless gas naturally present in outdoor air at low concentrations (~2 ppm). The methane sensor acts as a tracer gas to other combustible gases, making an important early-warning indicator of potentially flammable conditions.
- **Wind Speed and Direction:** Essential for determining whether detected changes in air quality may be associated with the Silfab Solar manufacturing facility or other sources.

Each of these parameters, the equipment used to measure them, and the sensor specifications are described in detail in Section 3.0.

3.0 Monitoring Equipment and Configuration

The monitoring equipment deployed at the Flint Hill Elementary and Middle School campus was selected to provide continuous, real-time measurement of the parameters described in Section 2.3 under ambient environmental conditions. All equipment is manufactured by Aeroqual, a New Zealand-based environmental monitoring company specializing in ambient air quality instrumentation, and distributed through Specto Technology, a provider of turnkey air quality monitoring solutions. This section describes the monitoring platform, individual sensor modules, and weather station used in the program.

3.1 Aeroqual AQS 1 Base Unit

The Aeroqual Air Quality Station (AQS 1) is a configurable outdoor monitoring platform designed for simultaneous measurement of particulate matter and gaseous pollutants. Each unit is housed in a weather-resistant enclosure, equipped with cellular connectivity for real-time remote data access through the Aeroqual Cloud platform, and solar-powered for continuous operation without reliance on grid power.

Data collected by the AQS 1 are transmitted via cellular connection and accessible to Citadel and authorized District personnel 24 hours per day through the Aeroqual Cloud data management platform. This platform supports real-time dashboards, automated alerts via Short Message Service (SMS) and email, and compliance reporting. All sensor modules installed in the AQS are calibrated to National Institute of Standards and Technology (NIST) traceable standards.

3.2 Particulate Matter Sensor (PCX Module)

Particulate matter is measured using the Aeroqual PCX module, an optical particle counter that uses scattered light to size and count airborne particles. The PCX module is installed within the AQS 1 and provides simultaneous measurements of PM_{2.5} and PM₁₀. It includes a controlled heated inlet to reduce humidity effects and active flow control for consistent sampling.

Table 1. Aeroqual PCX Module Specifications (PM_{2.5} and PM₁₀)

Size Fraction	Range (mg/m ³)	Resolution (µg/m ³)	Detection Limit (µg/m ³)	Precision	Accuracy
PM _{2.5}	0–30	0.1	0.1	3.1%	<5%
PM ₁₀	0–30	0.1	0.3	2.3%	<5%

Field testing produced R^2 values of 0.96 for both PM_{2.5} and PM₁₀ when compared to regulatory-grade reference instruments

3.3 Volatile Organic Compound Sensor (VOC Module)

Total Volatile Organic Compounds (TVOCs) are measured using the Aeroqual VOC module, which employs a photoionization detector (PID) sensor. The PID sensor generates an electrical current proportional to the concentration of organic compounds in the sampled air. The module uses a patented design that cycles between reading sample air and reading air filtered through a proprietary scrubber, which eliminates the effects of humidity on measurement accuracy.

The VOC module installed within the AQS 1 is sensitive to a wide range of volatile organic compounds, including but not limited to benzene and toluene.

Table 2. Aeroqual VOC Module Specifications

Module	Range	Resolution	Detection Limit	Precision	Linearity
VOC Low Range	0–500 ppb	0.1 ppb	1 ppb	2% or 1 ppb	1%
VOC High Range	0–30 ppm	0.01 ppm	0.05 ppm	2% or 0.05 ppm	2%

3.4 Methane Sensor (CH₄ Module)

Methane is measured using the Aeroqual CH₄ module, which employs a Gas Sensitive Semiconductor (GSS) sensor. The module contains a proprietary flow design that minimizes baseline drift, and the sample air is filtered through a proprietary scrubber to reduce interferences.

An important feature of the GSS-based methane sensor is its potential to respond to other combustible and flammable gases in the environment. Silane (SiH₄), one of the primary chemicals of concern at the Silfab Solar manufacturing facility, is a pyrophoric gas that ignites spontaneously on contact with air and is stored on-site in large quantities (approximately 290,000 cubic feet). While the methane sensor is not calibrated to detect silane directly, any unexpected change in sensor readings that does not correlate with known methane sources could serve as an early indicator warranting further investigation.

Table 3. Aeroqual CH₄ Module Specifications (Methane)

Range	Resolution	Detection Limit	Precision	Linearity	Noise at Zero
0–500 ppm	0.01 ppm	0.04 ppm	0.4% of reading	<1%	0.02 ppm

Field testing against a Picarro reference analyzer produced an R^2 of 0.87 and a mean absolute error (MAE) of 0.2 ppm.

3.5 Weather Station (AirMar 200WX)

Meteorological data are collected using an AirMar 200WX ultrasonic weather station. The 200WX uses ultrasonic technology with no moving parts, reducing maintenance requirements and improving long-term reliability. The weather station is housed in a compact, IPX6-rated (water-

resistant) enclosure and provides continuous measurement of wind speed, wind direction, air temperature, barometric pressure, and relative humidity.

Wind speed and direction data provide important context for understanding air quality readings and identifying potential source directions. By correlating air quality data with concurrent wind measurements, Citadel can determine whether detected changes in air quality are coming from the direction of the Silfab Solar manufacturing facility or from other sources.

Table 4. AirMar 200WX Weather Station Specifications

Parameter	Range	Accuracy	Resolution
Wind Speed	0–40 m/s	±5% @ 10 m/s	0.1 m/s
Wind Direction	0°–359.9°	±3° @ 10 m/s	0.1°
Air Temperature	–40° to 80°C	±1.1°C @ 20°C	0.1°C
Barometric Pressure	300–1100 hPa	±0.5 hPa	0.1 hPa
Relative Humidity	0–100% RH	±5% RH	0.1% RH

4.0 Monitoring Protocol

4.1 Monitoring Locations

Two perimeter AQS 1 monitoring stations are installed at the boundaries of the school property. One station is positioned at an upwind location to the southwest of the campus, and the second is positioned at a downwind location to the northeast. These locations were selected based on prevailing wind conditions and coordination with the District.

This upwind/downwind configuration is a standard practice in perimeter air monitoring. The upwind station measures air as it approaches the campus, while the downwind station measures air after it passes over the campus in the direction of the Silfab Solar manufacturing facility. Comparing data from both stations provides directional context that helps Citadel identify potential sources when elevated readings are observed.

4.2 Monitoring Schedule and Data Collection

The monitoring system operates continuously, 24 hours per day, 7 days per week, 365 days per year. Sensor modules record measurements at one-minute intervals, providing highly detailed temporal resolution of ambient air conditions. Data are transmitted in real time to the Aeroqual Cloud platform, where they are accessible to authorized Citadel personnel and authorized District personnel.

Citadel analyzes the data using both 15-minute rolling averages (for detailed short-term trend analysis) and 24-hour rolling averages (for comparison against federal National Ambient Air Quality Standards, or NAAQS). This dual-averaging approach ensures that both brief episodes and sustained conditions are captured and evaluated.

4.3 Baseline Reference Data

Baseline monitoring was conducted continuously from February 2 through February 28, 2026, prior to the commencement of operations at the Silfab Solar manufacturing facility. The full results are presented in the companion Perimeter Air Monitoring Baseline Report.

Establishing an understanding of baseline ambient air quality conditions, that is, the levels of particulate matter (PM_{2.5} and PM₁₀), volatile organic compounds (TVOCs), and methane (CH₄) typically present at the school campus prior to the start of operations at the Silfab Solar manufacturing facility, is one of the most important steps in a scientifically sound monitoring program. These measurements capture what the air quality around the school campus looks like before the facility begins producing solar panels, when there is no industrial influence on the surrounding environment.

Every month of future monitoring data will be compared directly against these baseline values. If a measured parameter begins to trend upward, or if a sudden spike is detected, Citadel can evaluate whether the change represents a meaningful departure from pre-operational conditions or falls within the range of normal variability already observed during the baseline period.

Without this reference point, it would be difficult to distinguish between air quality changes potentially associated with the facility and those influenced by everyday factors such as traffic patterns, seasonal weather, nearby construction, or regional air quality events. The baseline data gives the District, the community, and Citadel a clear, documented standard against which all future monitoring results will be compared. This foundation is what makes the ongoing monitoring program actionable; it allows Citadel to identify whether observed conditions fall within the range of normal variability or represent a meaningful departure that warrants further evaluation.

The following table summarizes the 24-hour rolling average baseline monitoring results for each continuously monitored parameter, along with the applicable health-protective standards for reference.

Table 5. Baseline Monitoring Results Summary (15-Minute Rolling Averages)

Parameter	NE Monitor (Downwind)	SW Monitor (Upwind)	Reference Level	Context
PM _{2.5} (µg/m ³)	9.589	10.526	35 (NAAQS 24-hr)	Approximately one-quarter to one-third of the federal standard
PM ₁₀ (µg/m ³)	12.624	14.223	150 (NAAQS 24-hr)	Well below federal standard; consistent with suburban SE U.S. conditions
Methane / CH ₄ (ppm)	2.275	3.306	<10 (typical bkgd)	Consistent with normal outdoor background (~2 ppm)
TVOCs (ppm)	0.0029	0.002	0.05–0.5 (AIHA guidance)	Far below the lower end of the AIHA recommended range for indoor air

Values shown are four-week averages based on 15-minute rolling averages. NAAQS = National Ambient Air Quality Standards; AIHA = American Industrial Hygiene Association; bkgd = background.

Table 6. Baseline Monitoring Results Summary (24-Minute Rolling Averages)

Parameter	NE Monitor (Downwind)	SW Monitor (Upwind)	Reference Level	Context
PM _{2.5} (µg/m ³)	10.336	10.607	35 (NAAQS 24-hr)	Approximately one-quarter to one-third of the federal standard
PM ₁₀ (µg/m ³)	13.328	14.348	150 (NAAQS 24-hr)	Well below federal standard; consistent with suburban SE U.S. conditions
Methane / CH ₄ (ppm)	2.238	1.710	<10 (typical bkgd)	Consistent with normal outdoor background (~2 ppm)

Parameter	NE Monitor (Downwind)	SW Monitor (Upwind)	Reference Level	Context
TVOCs (ppm)	0.0023	0.003	0.05–0.5 (AIHA guidance)	Far below the lower end of the AIHA recommended range for indoor air

Values shown are four-week averages based on 15-minute rolling averages. NAAQS = National Ambient Air Quality Standards; AIHA = American Industrial Hygiene Association; bkgd = background.

The following table denotes meteorological conditions recorded by the on-site weather station during the baseline period are summarized below. This data provides context for interpreting the air quality results; for example, wind direction helps determine whether an elevated reading may be coming from the direction of the Silfab Solar manufacturing facility, and temperature and humidity offer insight into temporal fluctuations in particulate matter and gases.

Table 7. Baseline Meteorological Conditions Summary (February 2-28, 2026)

Parameter	Average (24-hour rolling average)
Temperature (°F)	46.4
Relative Humidity (%)	65.5
Prevailing Wind Direction	West Southwest (WSW)
Average Wind Speed (mph)	2.63

As ongoing monitoring continues over the months, Citadel will compare each reporting period against these baseline values. Specifically, the monthly summary reports will include trend analyses showing whether measured concentrations remain stable, decline, or increase relative to the February 2026 baseline. Seasonal variations in temperature, humidity, and wind patterns are expected and will be accounted for when evaluating trends. Any anomalies or significant deviations from expected seasonal patterns will prompt a detailed investigation, including wind pattern analysis, review of Silfab Solar manufacturing facility operational status, and if warranted, targeted laboratory sampling to identify specific compounds.

5.0 Alert and Action Thresholds

An essential component of any continuous monitoring program is a clearly defined set of alert and action thresholds. These thresholds define the concentration levels at which Citadel will take specific actions, ranging from internal data review and notification to direct communication with the District and, if warranted, coordination with local emergency management authorities.

The thresholds described below were developed using a combination of federal standards, published regulatory guidance, peer-reviewed industrial hygiene practices, and site-specific baseline data. They are intentionally conservative, set below levels that would pose a health risk, to provide early warning and allow time for evaluation and response. Consequently, both 15-minute rolling averages (for detailed short-term trend analysis) and 24-hour rolling averages (for comparison against federal standards) will be used to set notification, alert, and action threshold levels, which will inform the applicable response procedure (see Section 6.0).

The following table provides a quick-reference summary of the thresholds for each continuously monitored parameter. Detailed descriptions and supporting context for each parameter follow in Sections 5.1 through 5.4.

Table 8. Summary of Parameter Alert and Action Thresholds

Parameter	Regulatory Standard	Citadel Notification	Alert Level	Action Level
PM _{2.5} (µg/m ³)	35 (NAAQS)	30 (15-min avg)	60 (15-min avg)	Exceeds NAAQS (24-hr avg)
PM ₁₀ (µg/m ³)	150 (NAAQS)	40 (15-min avg)	80 (15-min avg)	Exceeds NAAQS (24-hr avg)
Methane (ppm)	Industry Standard; global methane levels	3	7	>10
TVOCs (ppm)	DER-10 CAMP	~0.25 (15-min avg)	0.5 (15-min avg)	5 (15-min avg)

These thresholds are subject to refinement as additional operational data become available. Citadel will review and, if appropriate, adjust these values in consultation with the District as the Silfab Solar manufacturing facility transitions into full-scale operations.

5.1 Particulate Matter (PM_{2.5})

The federal National Ambient Air Quality Standard (NAAQS) for PM_{2.5} is 35 µg/m³ on a 24-hour average. Table 9 presents the site-specific notification, alert, and action thresholds for PM_{2.5}, along with the basis for each level and the corresponding response.

Table 9. PM_{2.5} Alert and Action Thresholds

Threshold Level	Value	Basis / Description
Notification	3 times above baseline average (i.e. exceeding ~30 µg/m ³ (15-min rolling avg) at NE (downwind) station)	Site-specific threshold meaningfully above observed baseline; triggers internal Citadel review of real-time data, wind patterns, and potential sources.
Alert	6 times above baseline average (i.e., exceeding ~60 µg/m ³ (15-min rolling avg) at either station)	Site-specific threshold indicates a meaningful departure from pre-operational conditions; prompts District notification .
Action	Exceeds 35 µg/m ³ (24-hr rolling avg) (NAAQS) at either station	Federal standard exceedance; triggers full response protocol and coordination with appropriate authorities.

5.2 Particulate Matter (PM₁₀)

The federal NAAQS for PM₁₀ is 150 µg/m³ on a 24-hour average. Table 9 presents the site-specific notification, alert, and action thresholds for PM₁₀, along with the basis for each level and the corresponding response.

Table 9. PM₁₀ Alert and Action Thresholds

Threshold Level	Value	Basis / Description
Notification	3 times above baseline average (i.e. exceeding ~40 µg/m ³ (15-min rolling avg) at NE (downwind) station)	Site-specific threshold meaningfully above observed baseline; triggers internal Citadel review of real-time data, wind patterns, and potential sources.
Alert	6 times above baseline average (i.e., exceeding ~80 µg/m ³ (15-min rolling avg) at either station)	Site-specific threshold indicates a meaningful departure from pre-operational conditions; prompts District notification .
Action	Exceeds 150 µg/m ³ (24-hr rolling avg) (NAAQS) at either station	Federal standard exceedance; triggers full response protocol and coordination with appropriate authorities.

5.3 Methane (CH₄)

Ambient outdoor methane concentrations are typically approximately 2 parts per million (ppm).

As noted in Section 3.4, the GSS-based methane sensor will be used as an indicator gas to other combustible and flammable gases, including silane, making it an important early-warning indicator of potentially flammable conditions.

Table 10. Methane Alert and Action Thresholds

Threshold Level	Value	Basis / Description
Notification	>3 ppm (15-min rolling avg) at NE (downwind) station)	Triggers Citadel's review of wind direction data and source assessment to determine whether elevation is facility-related.
Alert	>7 ppm (15-min rolling avg) at either station	May indicate additional combustible gas sources beyond normal background; prompts District notification .
Action	>10 ppm (15-min rolling avg) at either station	Significant elevation warranting immediate investigation and coordination with emergency management if appropriate.

Per NOAA global monitoring data, the current global methane level is ~1.9ppm.
<https://ourworldindata.org/grapher/long-run-methane-concentration>

5.4 Total Volatile Organic Compounds (TVOCs)

TVOC thresholds for this project have been developed using a tiered approach informed by multiple regulatory frameworks and site-specific baseline data. During the baseline monitoring period, TVOC concentrations measured by the continuous perimeter monitors ranged from 0.002 to 0.003 ppm (2 to 3 ppb), and for comparison laboratory results from quarterly air monitoring at Flint Hill Elementary demonstrated outdoor TVOCs were approximately 50 to 100 ppb (0.05 to 0.1 ppm).

Table 11. TVOC Alert and Action Thresholds

Threshold Level	Value	Basis / Description
Notification	0.25ppm (~250 ppb) 15-min rolling avg) at NE (downwind) station)	Site-specific threshold meaningfully above observed baseline; prompts Citadel's review of real-time data, wind conditions, and potential sources.
Alert	0.5 ppm (~500 ppb)(15-min rolling avg) at either station	Site-specific threshold indicates a meaningful departure from pre-operational conditions; prompts District notification .
Action	5 ppm (~5,000 ppb (15-min rolling avg) at either station	DER-10 framework threshold for work stoppage and corrective action; triggers full response protocol.

DER-10 reference: NYSDEC DER-10, Appendix 1A establishes one of the most technically rigorous perimeter air monitoring frameworks in the United States. While a New York State regulation not directly applicable in South Carolina, Citadel has adopted these thresholds as a conservative, health-protective benchmark.

6.0 Response Procedures

When monitoring data approach or exceed the thresholds defined in Section 5.0, Citadel follows a structured response protocol designed to verify the data, identify the cause, and coordinate with the appropriate parties.

6.1 Notification Level Response

When a notification threshold is reached, the monitoring platform generates an automated alert to Citadel via SMS and email. Citadel reviews the data in real time to verify accuracy, assess whether the reading is consistent with instrument error, localized interference, or an actual environmental change, to determine whether the trend is continuing or has been resolved. If the trend continues or the cause is unclear, Citadel escalates to the Alert Level response.

6.2 Alert Level Response

At the Alert Level, Citadel notifies the District and provides a preliminary assessment of the data, including wind direction analysis to determine the likely source direction. If the data suggest the readings may be associated with the Silfab Solar manufacturing facility or another identifiable off-site source, Citadel will recommend next steps, which may include enhanced monitoring frequency, targeted laboratory sampling, or coordination with Silfab Solar representatives.

6.3 Action Level Response

If monitoring data reach the Action Level, Citadel immediately notifies the District and recommends coordination with York County Emergency Management and, if applicable, the South Carolina Department of Health and Environmental Control (SCDHEC) Department of Environmental Services (DES). Citadel provides all available real-time data and analysis to support decision-making by the District and emergency response authorities.

The District's emergency response plans, developed in coordination with York County Emergency Management, outline the specific protective actions that may be taken at the school campus, including shelter-in-place, modified outdoor activity schedules, or other measures as determined by local emergency management officials.

7.0 Data Access and Transparency

Transparency is a fundamental principle of this monitoring program. The District and community should have confidence that the data collected is accurate, independent, and accessible.

7.1 Continuous Data Access

The continuous outdoor air perimeter monitors operate 24 hours a day, every day, and record new readings every minute. Those readings are transmitted directly to a secure monitoring platform managed by Citadel. Each sensor is programmed with set Notification Levels and corresponding notification triggers. If results begin trending upward or exceed a threshold, Citadel receives an immediate automated alert.

Authorized District personnel have remote access to the monitoring data. Reports summarizing monitoring activities, data trends, and observations will be made available to the community on the Fort Mill School District website to maintain transparency and public access to ongoing results.

7.2 Independent Safeguards

Multiple independent safeguards are built into this program to ensure that the data and conclusions are objective and scientifically defensible:

- Certified Industrial Hygienists (CIHs) on the project team are bound by strict ethical and professional standards that prohibit altering, tailoring, or suppressing results.
- All monitoring equipment is calibrated to NIST-traceable standards, and calibration records are maintained as part of the program's documentation.
- All methods are fully documented, transparent, and open to review, ensuring that findings are reproducible.

Citadel's professionals hold credentials governed by independent certification boards, including Certified Industrial Hygienist (CIH), Certified Hazardous Materials Manager (CHMM), and Safety and Compliance Professional (SCP), which require adherence to strict codes of ethics and continuing education.

7.3 Standards Used for Comparison

Results from both the continuous perimeter monitoring and the quarterly laboratory sampling are compared to the most conservative health-protective standards available.

Federal and state screening levels are built using research specific to children, accounting for faster breathing rates, smaller body size, and developing lungs, and assume continuous exposure 24 hours a day, 365 days a year. Given that students and staff spend only a fraction of that time at school, the actual exposure potential is far lower. These values are intentionally set far below the limits used for adult workers in factories or laboratories.

NAAQS

National Ambient Air Quality Standards (NAAQS) are established by the Environmental Protection Agency (EPA) under the Clean Air Act (1970) to protect public health and welfare from widespread air pollutants ("criteria pollutants" such as ozone, PM_{2.5}, CO, NO₂, SO₂, and lead).

NAAQS values are derived from extensive scientific review, including:

- Epidemiological and toxicological studies
- Exposure and risk assessments
- Recommendations from EPA's Clean Air Scientific Advisory Committee (CASAC)

Ambient air data used to assess compliance are collected from EPA-approved monitoring networks and reported as specific averaging times (e.g., 1-hour, 8-hour, annual), often using multi-year statistical forms (such as design values based on the 3-year average of high-end concentrations).

NAAQS are used to:

- Determine air quality attainment/nonattainment status
- Guide air permitting and emissions controls
- Serve as benchmarks for population-level exposure to outdoor (ambient) air pollution

They are not designed for indoor air, site-specific short-term screening, or total pollutant groupings (e.g., TVOCs), but rather for regional ambient air quality and regulatory compliance.

NYSDEC DER-10

DER-10 (Technical Guidance for Site Investigation and Remediation) is a New York State Department of Environmental Conservation (NYSDEC) program policy issued in 2010 that provides standardized technical guidance for investigating and remediating contaminated sites under state programs such as the State Superfund, Brownfield Cleanup Program, and petroleum spill response.

DER-10 originates from NYSDEC's effort to create a consistent, experience-based framework for site cleanup, drawing on regulatory requirements (e.g., 6 NYCRR Part 375), prior guidance, and decades of program implementation experience.

Data used under DER-10 are site-specific and project-driven, derived from:

- Environmental sampling (soil, groundwater, soil vapor, air)
- Field investigations and monitoring programs (e.g., Community Air Monitoring Plans, CAMP)
- Laboratory analysis following approved QA/QC procedures.
- This data is collected iteratively through site characterization, remedial investigation, and post-remediation monitoring phases.

DER-10 is used to:

- Guide the full lifecycle of contaminated site cleanup (investigation → remedy selection → remediation → closure)
- Establish minimum technical expectations acceptable to NYSDEC for remedial projects
- Provide a framework for protecting public health and the environment, including requirements such as air monitoring during remediation
- Support regulatory decision-making and approval of site remedies, rather than define standalone environmental standards

Unlike NAAQS, DER-10 does not establish ambient air quality limits or exposure standards; instead, it is a procedural and technical guidance document that integrates applicable standards, criteria, and guidance (SCGs) to evaluate and manage contamination at specific sites. NAAQS are health-based ambient air standards used for regulatory compliance and regional air quality management, while DER-10 is a procedural framework used to guide site investigation, risk evaluation, and cleanup activities at contaminated locations.

8.0 Quality Assurance and Quality Control

8.1 Instrument Calibration

All sensor modules are factory-calibrated using zero-air sources, certified calibration of gas standards, and certified gas dilution calibrators. Calibration is fully traceable to NIST primary standards. Field calibration is supported using the Aeroqual AirCal 1000 or 8000 calibration systems. Based on observed field drift rates, the recommended calibration frequency for all modules is one to three months, depending on site-specific data quality objectives.

8.2 Equipment Inspections

Citadel performs periodic equipment inspections to confirm proper operation, data quality, and sensor performance. Each sampling event includes field blanks; unused media opened and resealed on-site, to confirm that no contamination occurred during collection or transport. Any anomalies or data gaps are documented and addressed in monthly summary reports provided to the District.

8.3 Data Review and Validation

Monitoring data are reviewed by Citadel on a regular basis to identify any anomalies, instrument drift, or data quality concerns. If the District alerts Citadel that staff or students have reported health symptoms of concern, Citadel will conduct a data review and trend analysis to identify any short-term fluctuations or gradual increases compared with historical data and previous sampling events, even if the monitors do not show a threshold exceedance.

8.4 Recordkeeping

All monitoring data, calibration records, inspection logs, and correspondence related to the monitoring program are maintained by Citadel as part of the project file. Documentation is retained for the duration of the monitoring program and is available for review by the District upon request.

9.0 Reporting

9.1 Monthly Summary Reports

Citadel provides monthly summary reports to the District documenting monitoring activities, data trends, and any observations of note. These reports include a summary of the 15-minute and 24-hour rolling average data for each parameter, wind pattern analysis, and a comparison of measured values against the thresholds defined in Section 5.0.

9.2 Immediate Reporting

If monitoring data exceed an Alert or Action Level threshold, Citadel notifies the District immediately and provides a written summary of the event, including all 15-minute and hourly data collected during the period, wind direction analysis, and any corrective actions taken or recommended.

9.3 Quarterly Integration

Following each quarterly laboratory sampling event, Citadel integrates the perimeter monitoring data with the laboratory results to provide a comprehensive picture of air quality conditions at and around the school campuses. These integrated reports are provided to the District and made available to the community.

9.4 Annual Review

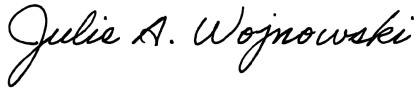
Following one full year of data collection, Citadel will conduct a comprehensive review of all monitoring data, including continuous perimeter data and quarterly laboratory results, and provide the District with an annual summary report. This review will include an assessment of whether the alert and action thresholds should be adjusted based on accumulated operational data.

10.0 References

- Citadel, Air Quality Monitoring Plan, Citadel Project No. 2732.1001.0, July 9, 2025.
- Citadel, Perimeter Air Monitoring Baseline Report, Citadel Project No. 2732.1002.0, April 2026.
- Citadel, Additional Questions and Responses, Fort Mill School District, November 20, 2025.
- CalEPA Department of Toxic Substances Control, Community Air Monitoring Plan Guidance, January 2020.
- New York State Department of Environmental Conservation, DER-10, Technical Guidance for Site Investigation and Remediation, Appendix 1A: Community Air Monitoring Plan.
- South Coast Air Quality Management District, Rule 403: Fugitive Dust.
- U.S. EPA, National Ambient Air Quality Standards (NAAQS), 40 CFR Part 50.
- U.S. EPA, Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites.
- South Carolina Department of Health and Environmental Control, Toxic Air Pollutant Standards, Regulation 61-62.5, Standard No. 8.
- American Industrial Hygiene Association (AIHA), Guidelines for Total Volatile Organic Compound Levels in Indoor and Outdoor Air.
- American Industrial Hygiene Association (AIHA), The IAQ Investigator's Guide, 3rd Edition, Levels Commonly Found Indoor.
- Aeroqual / Spectro Technology, AQS 1 Product Specifications; PCX PM Module Technical Performance Guide; VOC Module Technical Performance Guide; CH4 GSS Module Technical Performance Guide.
- AirMar, 200WX WeatherStation Technical Specifications.

11.0 Signatures

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