



REGION 4

ATLANTA, GA 30303

November 3, 2025

Mr. Derrick Boone
Assistant Public Services Director
City of High Point
211 South Hamilton Street
High Point, North Carolina 27261

Dear Mr. Boone:

This letter is in response to your September 26, 2025, submission to the U.S. Environmental Protection Agency concerning a petition (request) for revisions to a site-specific (also referred to as “alternative”) monitoring plan, prepared for the City of High Point by GEL Engineering of NC, Inc., located in Raleigh, NC, acting on behalf of the City’s Eastside Wastewater Treatment Plant (Eastside WWTP), located in Jamestown, NC. In a March 23, 2023, letter the EPA previously approved site-specific operating limits and monitoring procedures for the Eastside WWTP’s Sorbent Polymer Composite Material Adsorber (SPC), CD-04, to demonstrate compliance with requirements applicable to its sewage sludge fluidized bed incinerator (FBI) in accordance with 40 C.F.R. 60, Subpart M – Emissions Guidelines (EG) for Existing Sewage Sludge Incineration (SSI) Units (Subpart M).

The SPC system is used to control mercury emissions from Eastside WWTP’s sewage sludge fluidized bed incinerator (FBI), designated as source ES-01. The September 26, 2025, petition, referred to herein as “request”, proposed to modify the previously approved site-specific monitoring plan to account for low mercury influent conditions that have been observed at Eastside WWTP. The proposed revisions relax removal efficiency requirements when the mercury concentration at the SPC inlet is below the applicable emission standard. The EPA understands that higher removal efficiency is less feasible at very low influent levels and that the currently approved procedures may result in the premature replacement of SPC modules. Based on our review of the information provided, the EPA approves your request, noting that this approved revision allows for less than 70% removal efficiency across the SPC where inlet concentration to the SPC is demonstrated to be below the applicable emission standard *and outlet concentration is lower than the inlet concentration*. For quarterly tests meeting the emissions standard where inlet concentration is above the emission standard and 70% removal

efficiency is not demonstrated, Eastside WWTP will be required to conduct SPC module fabric sampling on each layer of media to assess capacity and replace any modules found to contain >2% mercury by weight. This sampling will be required at least yearly regardless of the demonstrated removal efficiency. Details regarding review of your request and the approval conditions are provided in the remainder of this letter and Decision Tree in the addendum.

Background on Subpart M MMM Site-specific Monitoring and Previous EPA Approval

On May 2, 2018, EPA delegated authority of the Federal SSI plan for existing SSI units to the North Carolina Department of Environmental Quality (NCDEQ) (See 83 FR 19184). The approval of major alternatives to monitoring, however, are not delegated to state agencies under the provisions of 40 C.F.R. 62, § 62.16050. Under § 60.5175(b), if a facility does not use a wet scrubber, fabric filter, electrostatic precipitator, activated carbon injection, or afterburner, or if emissions are limited in some other manner (e.g., materials balance), then the facility must submit a petition to the EPA which proposes a monitoring plan for the alternative control device. The monitoring plan must support the choice of operating parameters and discuss how the operating parameters will be established, and the instruments used for monitoring any approved alternative parameters must be calibrated by the methods and at the frequency discussed in the petition. Eastside WWTP installed SPC modules to control emissions of mercury from the SSI. SPC modules are fluoro-polymer adsorbers impregnated with carbon. The EPA previously approved site-specific monitoring procedures for the SPC in a March 23, 2023, letter to you that includes further background and detail on the operation of the control device and the approved monitoring parameters and procedures.

Description of the SSI and SPC System at Eastside WWTP

Eastside WWTP operates a sewage sludge FBI which is designated as source ES-01. The FBI is designed to incinerate up to a maximum charge rate of 3,000 pounds of dry sludge per hour. The FBI is fired by natural gas/No. 2 fuel oil-fired burners, and the maximum auxiliary heat input rate is 5 million British thermal units per hour (MMBtu/hr). Emissions from the FBI are controlled by a wet scrubber (CD-01) and SPC material adsorber (CD-04).

The SPC material adsorber consists of five layers of adsorbent, each layer containing 5 removable SPC modules. The configuration allows for the addition of SPC modules as needed in the future and can accommodate up to a maximum capacity of 45 SPC modules total. The dimensions of each individual SPC module are 26.9 inches (") length x 24.9" width x 13.06" height.

SSI Alternative Regulatory Requirements

Under 40 C.F.R. 60, § 60.5175(b)(1-5), a petition must identify specific parameters to be monitored, a discussion of the relationship between these parameters and the emissions of regulated pollutants, a discussion of the parameter operating limits and averaging periods, the instruments and methods used to monitor these parameters, and the frequency and methods for recalibrating the instruments used for monitoring these parameters. The City's request addresses these requirements.

City of High Point's Current Request for Eastside WWTP

The request notes the following details about the proposed revisions to the alternative monitoring plan (AMP), and includes a decision tree that reflects these conditions:

Eastside WWTP will measure the mercury concentration in the flue gas stream upstream and downstream of the SPC modules to develop a pattern of removal efficiency across the layers of SPC modules. Flue gas mercury concentrations will be measured by using EPA method 30B, conducted by a third party at quarterly intervals.

As noted in the decision tree included [in the request and as an addendum to this letter], if the measured inlet mercury concentration is less than the emission limit of 0.037 milligrams per dry standard cubic meter (mg/dscm) during any of the quarterly testing events, compliance has been demonstrated with the requirements of the AMP. If the measured outlet mercury concentration is greater than the emission limit of 0.037 during a quarterly testing event, the FBI will be shut down and the City will contact the SPC's manufacturer to determine the reason(s) for the failed compliance test.

Removal Efficiency

The removal efficiency will be limited to a minimum of 70%, so long as the outlet concentration is below the allowable mercury emission limit and the inlet concentration is greater than the emission limit. Once the removal efficiency drops below 70% of the influent concentration for this scenario, Eastside WWTP will have the fabric tested to determine if it is saturated with mercury as discussed below. The fabric is considered saturated at 2% or higher.

Monitor Pressure Drop across the SPC Material Adsorber

The pressure drop across the SPC material adsorber (CD-04) is measured by a differential pressure instrument. Monitoring of the pressure drop will help the operator determine whether the SPC Material Adsorber has a buildup of dust, moisture or precipitates. Normally, an increase in pressure is very slow and gradual over time. An acceleration of the rate of increase in pressure drop across the SPC material adsorber is an indication that the process may be operating outside the design parameter. The pressure drop will be recorded in the Supervisory Control and Data Acquisition (SCADA) system for long term monitoring.

Monitor SPC Material Adsorber Inlet Gas Temperature

The temperature of the inlet flue gas will be measured by a temperature gauge. The mercury control modules may be compromised if the SPC material adsorber inlet gas temperature exceeds 150 degrees Fahrenheit (°F). The system is programmed to activate an alarm if the inlet gas temperature exceeds 120 °F. If the SPC material adsorber inlet gas temperature exceeds 150 °F, the system will shutdown the SPC material adsorber

and sludge feed to the incinerator. The SPC material adsorber inlet gas temperature will be recorded in the SCADA system for continuous long-term monitoring.

SPC Media Testing (Fabric)

The SPC material adsorber contains five layers of SPC media modules, with space for an additional four layers if required in the future. A small approximate 1-inch square cutout of the media from each layer of SPC media will be taken and analyzed for mercury content by weight using EPA Method 7473 if the removal efficiency is less than 70% and the inlet mercury concentration is greater than the emission limit. If the analytical results indicate that the fabric is saturated (2% or higher), the City will replace the saturated modules and rotate the modules per the manufacturer's operation and maintenance requirements.

CD-04 [SPC] Inspection

The City will perform an internal and external inspection of the SPC material adsorber annually. A copy of the inspection report which will include fabric analytical results will be kept on file.

The request further notes that:

The SPC mercury removal efficiency is a function of the available surface area, or media bed depth, provided within the installation. In other words, increasing the media surface area over which the incinerator exhaust gases must pass will increase the effective mercury removal efficiency of the system. As the exhaust gases pass over and through the SPC media modules, elemental and oxidized forms of mercury are chemically bound to the media in the form of stable mercury compounds. As described by the vendor, W.L. Gore and Associates, the media modules are passive, meaning that they will continuously remove mercury from the exhaust gas without requiring adjustment, regeneration, or replacement until the mercury removal capacity is reached. As previously noted, a 2% mercury by weight threshold will be considered the point at which the mercury removal capacity of the media has been reached and considered saturated.

The following parameter limits are proposed for the SPC material adsorber:

Parameter	Limit	Units	Recordkeeping Frequency	Averaging Period for Compliance
Pressure drop	Established during compliance tests	Inches of water column	Every 60 seconds	12 hours
Inlet gas temperature	≤ 150	°F	Every 60 seconds	12 hours

Removal Efficiency	≥ 70% & Inlet Concentration > 0.037 mg/dscm	NA	Quarterly	NA
Fabric Hg Content	≤ 2%	NA	At least annually	NA

The request further describes measurement methods and instruments as follows:

Removal Efficiency

Eastsides WWTP will use a carbon trap sampling system as provided by a third-party testing unit. The carbon trap samples will be analyzed in accordance with EPA Method 30B, each measurement point will be analyzed simultaneously.

The SPC modules will be spray-washed for a minimum of one minute once every twelve hours as indicated by the manufacturer. A record of the SPC module rotations will be kept onsite. [A]n annual measurement of the available capacity in the most upstream (bottom) tier of SPC modules to measure available uptake capacity will be performed. This is a good indicator of anticipated remaining life in the SPC material due to the dependence on influent concentrations.

Pressure Drop

3051C coplanar pressure transmitter; D measurement type differential; 1 pressure range -25 to 25 in H₂O (-62.2 to 62.2 mbar)

Inlet Gas Temperature

Rosemount model 3144P 0-200 °F temperature sensor

SPC Media Testing (Fabric)

Physical samples from each layer of SPC media modules will be taken and sent to an independent testing laboratory (ITO) for analysis every year. Mercury content of the samples will be determined utilizing a Lumex method based on thermal desorption per EPA Method 7473, for which the instrument detection limit (IDL) is 0.01 nanogram (ng) of total mercury, and also by utilizing the Zeeman atomic absorption spectrometer RA-915+, which is suitable for the direct determination of mercury concentrations in various samples with a low detection limit of 0.5 ng mercury/L.

Equipment Calibration

Pressure instruments and the inlet gas temperature sensor will be monitored continuously by the plant's SCADA system and will be calibrated annually by a qualified technician. Maintenance records will be kept in the plant's logbook.

The EPA Approval and Required Conditions

The EPA approves the City's proposed site-specific monitoring procedure revisions, as proposed, with two additional conditions. Regarding situations where the measured inlet mercury concentration to the SPC is less than the emission limit of 0.037 mg/dscm, the outlet concentration must not only be less than the emission limit, but must also be less than the inlet concentration, unless both inlet and outlet concentrations are below the test method detection limit. If outlet concentration is higher than inlet concentration, desorption, filter failure, or sampling issues may be indicated. The following condition applies to quarterly testing and is also addressed in Addendum 1 at the end of this letter:

- If both inlet and outlet concentrations are below the emission standard but above the method detection limits, and the outlet concentration is higher than the inlet concentration, Eastside WWTP must inspect the SPC as necessary and consult with the North Carolina Division of Air Quality (NCDAQ) within 10 days. NCDAQ may establish criteria for this condition and may require re-testing at its discretion.

The EPA's second condition for this approval requires that, in addition to parameters included in the table above, Eastside must monitor "Delta T" (change in temperature) of the gas stream between the wet scrubber outlet and the SPC inlet. The EPA understands this parameter is already being monitored by Eastside WWTP per the EPA's previous approval letter. The EPA's March 23, 2023, letter noted that:

Wet scrubbers inherently discharge flue gas which is pseudo-saturated with moisture. The moisturized stream may also contain water droplets, which may cover active mercury deposition adsorption sites, producing mercury adsorption inhibition. For this reason, indication of relative humidity (RH) in the adsorption zone is necessary to achieve mercury removal from the flue gas.

On October 27, 2022, after a discussion between the EPA and Eastside WWTP, Eastside WWTP submitted temperature data for the wet scrubber [(CD-01)] outlet and the [SPC composite material adsorber (CD-04)] inlet, for compliance demonstration stack testing conducted in 2019, 2020, 2021, and Eastside WWTP used the data measured and recorded during the stack testing to determine and propose a minimum "Delta T" parameter; the temperature difference between the scrubber outlet and the [SPC] Inlet.

As Eastside WWTP explained in the submittal, the determination for the Delta T parameter is based on the lowest 4-hour averages observed in those reports. Specifically, the observed site-specific operating parameter limit was observed as 7.91 °F in 2019, 8.26 °F in 2020, and 8.44 °F in 2021. Eastside WWTP contends, based on these data, the Delta T operating parameter is the appropriate parameter to measure since it shows that the operation of the [SPC] preheater works to reduce the humidity.

Therefore, the monitoring parameters approved in this letter are the following:

Parameter	Limit	Units	Recordkeeping Frequency	Averaging Period for Compliance
Pressure drop	Established during compliance tests	Inches of water column	Every 60 seconds	12 hours
Inlet gas temperature	≤ 150	$^{\circ}\text{F}$	Every 60 seconds	12 hours
Removal Efficiency	$\geq 70\%$ & Inlet Concentration > 0.037 mg/dscm	NA	Quarterly	NA
Fabric Hg Content	$\leq 2\%$	NA	At least annually	NA
Delta T	$\geq 8.6^{\circ}$	Fahrenheit	At least once every 15 minutes	12 hours

The City must ensure that the procedures and requirements laid out in this site-specific monitoring approval are fully incorporated in a timely manner into the applicable NCDAQ operating permit(s) and into an updated site-specific monitoring plan, if applicable. This response was developed in coordination with the EPA's Office of Air Quality Planning and Standards and Office of Enforcement and Compliance Assurance. This approval is based on the information provided to the EPA and the EPA may alter this approval in the future if the agency determines that it is warranted. If you have any questions regarding this approval, please contact Jake Carpenter at (404) 562-9039 or at carpenter.jacob@epa.gov.

Sincerely,

DENISSE DIAZ Digitally signed by DENISSE DIAZ
Date: 2025.11.03 08:34:48 -05'00'

Denisse D. Diaz
Director
Air and Radiation Division

cc: James Matilla, EPA OAQPS
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Keith McCulloch, GEL Engineering
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Addendum

Proposed Eastside WWTP Quarterly Hg Test Decision Tree with the EPA suggested revisions in red

