



1580 Columbia Turnpike, Building 1, Suite 1; Castleton-On-Hudson, NY 12033 / P 518.460.8036 / trinityconsultants.com

Submitted via email only

Attention: kevin.balduzzi@dec.ny.gov dep.r7@dec.ny.gov

NON-CONFIDENTIAL SUBMITTAL

July 15, 2025

Mr. Kevin Balduzzi
Regional Permit Administrator
Division of Air Resources, Region 7
New York State Department of Environmental Conservation
5786 Widewaters Parkway, Syracuse, NY 13214-1867

RE: Micron New York Semiconductor Manufacturing, LLC, Clay, NY
PSD/NNSR Air Permit Application 2 for the Proposed Air Permit Project
Submission of Proposed Permit Condition Language

Dear Mr. Balduzzi:

On March 10, 2025, Micron New York Semiconductor Manufacturing, LLC (Micron) submitted a PSD/NNSR and Title V air permit application for the construction and operation of the Proposed Air Permit Project in Clay, New York. On April 30, 2025, the New York State Department of Environmental Conservation (NYSDEC) sent Micron a Notice of Incomplete Application (NOIA) identifying additional information needed in support of the application.

Micron submitted its responses to the NOIA on June 06, 2025 and submitted updated sections and appendices of its air permit application on July 08, 2025. To supplement the information provided in those letters, Micron is providing proposed permit condition language, as requested by NYSDEC in the NOIA, as well as updates to related appendices. The following documents are included in this submittal:

- Proposed Permit Condition Language
- Appendix C – Methods of Compliance Form
- Updated Appendix D – OpFlex Protocol
- Updated Appendix T – Stack test Plan

This submittal does not contain information that is considered proprietary, confidential business information, and/or trade secret information to Micron ("confidential business information"). Therefore, one non-confidential copy of the submittal is provided.

Based on the NYSDEC's verbal contingent approval of the air dispersion modeling protocol (submitted on April 5, 2025), the final air dispersion modeling report will be submitted by August 15, 2025. Upon submittal of the modeling report, Micron will have addressed all comments in the NOIA via written submittals to NYSDEC. We appreciate the expeditiousness and collaboration

HEADQUARTERS

12700 Park Central Dr, Ste 600, Dallas, TX 75251 / P 800.229.6655 / P 972.661.8100 / F 972.385.9203

July 15, 2025

demonstrated by the NYSDEC team in reviewing our application and look forward to receiving the Notice of Complete Application and the draft permit for review soon.

If you have any questions regarding this application, please contact me at (724) 442-6809 or tmuscenti@trinityconsultants.com.

Sincerely,

Tom Muscenti, P.E.
Regional Director
Trinity Consultants

ecc cover letter only:

Mr. Robert Jacobs, NYSDEC
Mr. Andy LoFaro NYSDEC
Ms. Marissa Logan, NYSDEC
Mr. Patrick Foster, NYSDEC
Ms. Ashley Kunz, Micron
Ms. Brittany Sanders, Micron
Ms. Katie Birchenough, Micron
Ms. Jesse McMahon, Micron
Ms. Kailin Schwan, Micron
Mr. Jacob Bugiera, Trinity Consultants
Mr. Sundar Sadashivam, Trinity Consultants

DRAFT PERMIT CONDITION LANGUAGE

40 CFR 60 Subpart Dc: Affected facilities meeting the applicability criteria in 40 CFR § 60.40c must comply with relevant requirements in 40 CFR Part 60 Subpart Dc.

40 CFR 60 Subpart IIII: Affected facilities meeting the applicability criteria in 40 CFR § 60.4200 must comply with relevant requirements in 40 CFR Part 60 Subpart IIII.

40 CFR 63 Subpart ZZZZ: Affected sources meeting the applicability criteria in 40 CFR § 63.6585 must comply with relevant requirements in 40 CFR Part 63 Subpart ZZZZ.

40 CFR 63 Subpart BBBB, §63.7184(b): For each organic HAP process vent, other than process vents from storage tanks, the facility must either reduce the emissions of organic HAP from the process vent stream by 98 percent by weight OR reduce or maintain the concentration of emitted organic HAP from the process vent to less than or equal to 20 parts per million by volume (ppmv). These limitations can be met by venting emissions from each process vent through a closed vent system to any individual or combination of control devices meeting the requirements of 40 CFR § 63.982(a)(2).

For each process vent emission limitation in §63.7184 for which initial compliance is demonstrated by meeting a percent by weight HAP emissions reduction, or a HAP concentration limitation, the facility must conduct performance tests or an initial compliance demonstration within 180 days after startup and according to the provisions in §63.7(a)(2). Startup of each exhaust header will be the date on which the processes routing to the exhaust header begins full operation.

40 CFR 63 Subpart BBBB, §63.7184(c): For each inorganic HAP process vent, other than process vents from storage tanks, the facility must either reduce the emissions of inorganic HAP from the process vent stream by 95 percent by weight OR reduce or maintain the concentration of emitted inorganic HAP from the process vent to less than or equal to 0.42 parts per million by volume (ppmv). These limitations can be met by venting emissions from each process vent through a closed vent system to a halogen scrubber meeting the requirements of 40 CFR § 63.983 (closed vent system requirements) and §63.994 (halogen scrubber requirements); the applicable general monitoring requirements of 40 CFR § 63.996; the applicable performance test requirements; and the monitoring, recordkeeping and reporting requirements referenced therein.

For each process vent emission limitation in 40 CFR § 63.7184 for which initial compliance is demonstrated by meeting a percent by weight HAP emissions reduction, or a HAP concentration limitation, the facility must conduct performance tests or an initial compliance demonstration within 180 days after startup and according to the provisions in 40 CFR § 63.7(a)(2). Startup of each exhaust header will be the date on which the processes routing to the exhaust header begins full operation.

40 CFR 63 Subpart BBBB, §63.7184(d): For each storage tank, 1,500 gallons or larger, the facility must either reduce the emissions of inorganic HAP from each storage tank by 95 percent by weight OR reduce or maintain the concentration of emitted inorganic HAP from the process vent to less than or equal to 0.42 parts per million by volume (ppmv), if the emissions from the storage tank vent contains greater than 0.42 ppmv inorganic HAP. These limitations can be met by venting emissions from each storage tank through a closed vent system to a halogen scrubber meeting the requirements of 40 CFR § 63.983 (closed vent system requirements) and 40 CFR § 63.994 (halogen scrubber requirements); the applicable general monitoring requirements of 40 CFR § 63.996; the applicable performance test requirements; and the monitoring, recordkeeping and reporting requirements referenced therein.

For each process vent or storage tank vent emission limitation in 40 CFR § 63.7184 for which initial compliance is demonstrated by meeting a percent by weight HAP emissions reduction, or a HAP concentration limitation, the facility must conduct performance tests or an initial compliance demonstration within 180 days after startup and according to the provisions in 40 CFR § 63.7(a)(2). Startup of each exhaust header will be the date on which the processes routing to the exhaust header begins full operation.

40 CFR 63 Subpart BBBBB, §63.7188: At all times, including periods of startup, shutdown, and malfunction, the owner or operator must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures (including the startup, shutdown, and malfunction plan required in 40 CFR § 63.6(e)(3)), review of operation and maintenance records, and inspection of the source.

The facility must develop and submit to the Administrator for approval a site-specific monitoring plan that addresses the criteria specified in 40 CFR § 63.7187(e)(1) through (3). The site-specific monitoring plan must also address the procedural processes in 40 CFR § 63.7187(f)(1) through (3). The facility must conduct a performance evaluation of each continuous monitoring system in accordance with the site-specific monitoring plan and must operate and maintain the continuous monitoring system in continuous operation according to the site-specific monitoring plan.

The facility will demonstrate proper operation and maintenance of RCTOs used to meet the requirements of 40 CFR §63.7184(b) and (d) by venting the emissions of the semiconductor process vents through a closed vent system to a control device and complying with the applicable requirements of 40 CFR § 63.7188 paragraphs (a) and (b):

(a) Meet the applicable general monitoring, installation, operation, and maintenance requirements specified in 40 CFR § 63.996.

(b) Meet the monitoring, installation, operation, and maintenance requirements specified for closed vent systems and applicable control devices in 40 CFR §§ 63.983 through 63.995.

If the design evaluation procedure in 40 CFR § 63.7187(i) is used to demonstrate compliance, use the information from the design evaluation to establish the operating parameter level for monitoring of the control device.

For each process defined, a minimum number of RCTO burners must meet the referenced requirements at any given time. This minimum number will be determined during the initial performance test and may be changed by the facility through a permit modification.

40 CFR 63 Subpart BBBBB, §63.7188: At all times, including periods of startup, shutdown, and malfunction, the owner or operator must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures (including the startup, shutdown, and malfunction plan required in 40 CFR § 63.6(e)(3)), review of operation and maintenance records, and inspection of the source.

The facility must develop and submit to the Administrator for approval a site-specific monitoring plan that addresses the criteria specified in 40 CFR § 63.7187(e)(1) through (3). The site-specific monitoring plan must also address the procedural processes in 40 CFR § 63.7187(f)(1) through (3). The facility must conduct a performance evaluation of each continuous monitoring system in accordance with the site-specific monitoring plan and must operate and maintain the continuous monitoring system in continuous operation according to the site-specific monitoring plan.

The facility will demonstrate proper operation and maintenance of acid scrubbers used to meet the requirements of 40 CFR § 63.7184(b), (c) and (d) by venting the emissions of the semiconductor process vents through a closed vent system to a control device and complying with the applicable requirements of 40 CFR § 63.7188 paragraphs (a) and (b):

(a) Meet the applicable general monitoring, installation, operation, and maintenance requirements specified in 40 CFR § 63.996.

(b) Meet the monitoring, installation, operation, and maintenance requirements specified for closed vent systems and applicable control devices in 40 CFR § 63.983 through 63.995.

If the design evaluation procedure in 40 CFR § 63.7187(i) is used to demonstrate compliance, use the information from the design evaluation to establish the operating parameter level for monitoring of the control device.

For each process defined, a minimum number of acid scrubbers must meet the referenced requirements at any given time. This minimum number will be determined during the initial performance test and may be changed by the facility through a permit modification.

40 CFR 63 Subpart BBBBBB, §63.7185(c): At all times, including periods of startup, shutdown, and malfunction, the owner or operator must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures (including the startup, shutdown, and malfunction plan required in 40 CFR § 63.6(e)(3)), review of operation and maintenance records, and inspection of the source.

The facility will prepare and comply with a startup, shutdown, and malfunction plan (SSMP) meeting the requirements of 40 CFR § 63.6(e)(3).

40 CFR 63 Subpart BBBBBB, §63.7189: The facility must submit to the Administrator all of the notifications in 40 CFR § 63.7(b) and (c), §63.8(e), (f)(4) and (6), and §63.9(b) through (h) that apply by the dates specified, as required by 40 CFR 63 Subpart BBBBBB.

As specified in 40 CFR § 63.9(b)(3), the facility must submit an Initial Notification not later than 120 calendar days after a source becomes subject to Subpart BBBBBB.

The facility must submit a notice of intent to conduct a performance test at least 60 calendar days before the performance test is scheduled to begin as required in 40 CFR § 63.7(b)(1).

The facility must submit a Notice of Compliance Status according to 40 CFR § 63.9(h)(2)(ii). For each initial compliance demonstration that does not include a performance test, the facility must submit the Notification of Compliance Status before the close of business on the 30th calendar day following the completion of the initial compliance demonstration. If the design evaluation procedure in 40 CFR §

63.7187(i) was used to demonstrate compliance, the facility must include the results of the design evaluation in the Notification of Compliance Status.

For each initial compliance demonstration required that includes a performance, the facility must submit a notification of the date of the performance evaluation at least 60 days prior to the date the performance evaluation is scheduled to begin as required in 40 CFR § 63.8(e)(2).

40 CFR 63 Subpart BBBBB, §63.7190: The facility must submit the following reports:

Periodic compliance reports. The facility must submit a periodic compliance report that contains the information required under 40 CFR 63.7190(c) through (e), and any requirements specified to be reported for process vents in 40 CFR § 63.982(a)(2) and storage tanks in 40 CFR § 63.982(a)(1).

Immediate startup, shutdown, and malfunction report. The facility must submit an Immediate Startup, Shutdown, and Malfunction Report if it had a startup, shutdown, or malfunction during the reporting period that is not consistent with its SSMP. Each report must contain actions taken during the event. The facility must submit this report by fax or telephone within 2 working days after starting actions inconsistent with the SSMP. The facility is required to follow up this report with a report specifying the information in 40 CFR § 63.10(d)(5)(ii) by letter within 7 working days after the end of the event unless alternative arrangements alternative arrangements have been made with the Department or Administrator.

40 CFR 63 Subpart BBBBB, §63.7191: The facility must keep records according to 40 CFR § 63.7191(a) and (b).

40 CFR 63 Subpart DDDDD, §63.7540(a)(10): Boilers and process heaters in the units designed to burn gas 1 fuels subcategory are not subject to the emission limits in Tables 1 and 2 or Tables 11 through 15 to 40 CFR 63 Subpart DDDDD, or the operating limits in Table 4 to 40 CFR 63 Subpart DDDDD.

A new or existing boiler or process heater without a continuous oxygen trim system and with heat input capacity of 10 million Btu per hour or greater must conduct a tune-up of the boiler or process heater annually as specified in 40 CFR § 63.7540. Units in the Gas 1 subcategory will conduct this tune-up as a work practice for all regulated emissions under 40 CFR 63 Subpart DDDDD.

For new or reconstructed affected sources, the facility must demonstrate initial compliance with the applicable work practice standards in Table 3 to 40 CFR 63 Subpart DDDDD within the applicable annual, biennial, or 5-year schedule as specified in 40 CFR § 63.7515(d) following the initial compliance date specified in 40 CFR § 63.7495(a). Thereafter, the facility is required to complete the applicable annual, biennial, or 5-year tune-up as specified in 40 CFR § 63.7515(d).

40 CFR 63 Subpart DDDDD, §63.7545: The facility must submit to the Administrator all of the notifications in 40 CFR § 63.7(b) and (c), § 63.8(e), (f)(4) and (6), and § 63.9(b) through (h) that apply by the dates specified, as required by 40 CFR 63 Subpart DDDDD.

As specified in 40 CFR § 63.9(b)(4) and (5), the facility must submit an Initial Notification not later than 15 days after the actual date of startup of the affected source.

Since the facility is not required to conduct an initial compliance demonstration as specified in 40 CFR § 63.7530(a), it must submit a Notification of Compliance Status containing only the information specified in 40 CFR § 63.7545(e)(1) and (8) and must be submitted within 60 days of the compliance date specified at 40 CFR § 63.7495(b).

40 CFR 63 Subpart DDDDD, §63.7550: The facility must submit each compliance report, according to 40 CFR § 63.7550(h), by the date in Table 9 to Subpart DDDDD, and according to the requirements in 40 CFR § 63.7550 (b)(1) through (4). For units that are subject only to a requirement to conduct subsequent annual, biennial, or 5-year tune-up according to 40 CFR § 63.7540(a)(10), (11), or (12), respectively, and not subject to emission limits or Table 4 operating limits, the facility may submit only an annual, biennial, or 5-year compliance report, as applicable, as specified in paragraphs (b)(1) through (4) of 40 CFR § 63.7550, instead of a semi-annual compliance report.

40 CFR 63 Subpart DDDDD, §63.7555: The facility must keep records according to 40 CFR § 63.7555(a)(1) and (2), and records according to 40 CFR § 63.7555(h) as applicable.

6 NYCRR 201-7.1: The facility will limit the hours of operation of each emergency engine to no more than 100 hours per calendar year, including for maintenance and testing. For each emergency engine, a record of the number of hours operated per year must be maintained for a minimum of five years.

The facility shall install an hour-meter on each emergency engine to record the time operated and report the hours in each compliance report.

6 NYCRR 201-7.1: During each 24-hour period, 38 engines will be limited to no more than 4 hours of operation and, separately, 34 engines will be limited to no more than 8 hours of operation. For each emergency engine subject to this condition, a record of the date and time of each hour of operation must be maintained for a minimum of five years.

The facility shall install an hour-meter on each emergency engine to record the time operated and report the hours in each compliance report.

6 NYCRR 201-7.1: The facility will limit the hours of operation of each water bath vaporizer (WBV) to no more than 2,000 hours per calendar year. For each WBV, a record of the number of hours operated per year must be maintained for a minimum of five years.

6 NYCRR 201-7.1: The facility will limit the total combined hours of operation of all water bath vaporizers to no more than 8,000 hours per calendar year. For each WBV, a record of the number of hours operated per year must be maintained for a minimum of five years.

6 NYCRR 201-7.1: The facility will limit the hours of operation of each natural gas-fired boiler to no more than 6,000 hours per calendar year. For each boiler, a record of the number of hours operated per year must be maintained for a minimum of five years.

6 NYCRR 212-1.5(e)(2): A process emission source subject to the Federal National Emission Standards for Hazardous Air Pollutants (NESHAP) under 40 CFR part 61 or part 63 satisfies the requirements of 6 NYCRR 212 for the respective air contaminant regulated by the Federal standard if the facility owner or operator can demonstrate that the process emission source is in compliance with the relevant Federal regulation and, for those NESHAPs regulating HTACs found in 6 NYCRR 212-2.2, table 2 – high toxicity air contaminant list, provide a toxic impact assessment (TIA) demonstrating that the maximum offsite ambient air concentration is less than the AGC/SGC or meeting the mass emission limit identified in 6 NYCRR 212-2.2, Table 2.

6 NYCRR 212-1.5(f): Facility owners or operators whose process operations emit NO_x or VOCs and meet the applicability requirements of 6 NYCRR 212-3 or 212-4 are not subject to the control provisions in 6 NYCRR 212-2 for NO_x or VOCs. However, if an individual air contaminant, as a component of total VOCs, is assigned an environmental rating of A, that individual air contaminant must meet the control requirements of 6 NYCRR 212-2.

6 NYCRR 212-1.5(g): At all times, the facility owner or operator must operate and maintain all process emission sources, including the associated air pollution control and monitoring equipment, in a manner consistent with safety, good air pollution control practices, good engineering practices and manufacturers' recommendations for minimizing emissions.

6 NYCRR 212-1.6: No facility owner or operator shall cause or allow emissions having an average opacity during any six consecutive minutes of 20 percent or greater from any process emission source or emission point, except for the emission of uncombined water. Visible emissions monitoring will be conducted at the request of the Department to demonstrate compliance with this limit.

6 NYCRR 212-1.7(b) (Semi & PEEC & VOL Storage Tanks): Continuous monitors and data recorders are required to measure combustion and outlet temperatures. Continuous monitors must be operated at all times when the associated emission control equipment is operating except during any quality assurance and routine maintenance activities. Each monitor must be operated according to a quality assurance program approved by the department. The facility shall maintain an up-to-date copy of the quality assurance program available to the department upon request. Alternative monitoring methods may be employed subject to department approval.

The facility shall keep record of the date, time and duration of all periods the control devices were not in operation during the normal operations of the equipment that it controls including startup/shutdown, malfunction or curtailment.

6 NYCRR 212-2.1(a): For an air contaminant listed in 6 NYCRR 212-2.2 table 2 – high toxicity air contaminant list, the facility owner or operator shall limit the actual annual emissions from all process operations at the facility so as to not exceed the mass emission limit listed for the individual HTAC.

6 NYCRR 212-2.1(b): For any air contaminant not listed on 6 NYCRR 212-2.2 table 2, unless it is a solid particulate described in 6 NYCRR 212-2.1(c) of this section or compliance with 6 NYCRR 212-1.5(e) or (f) can be demonstrated, the facility owner or operator shall not allow emissions of an air contaminant to violate the requirements specified in subdivision 212-2.3(a), table 3 – degree of air cleaning required for criteria air contaminants of this Subpart, or subdivision 212-2.3(b), table 4 – degree of air cleaning required for non-criteria air contaminants of this Subpart, as applicable, for the environmental rating assigned to the contaminant by the department.

All air contaminants listed in the permit application receiving an Environmental rating of A with an ERP less than 0.1 lbs/hr and all air contaminants listed in the permit application receiving an Environmental rating of B or C and with an ERP less than 10 lbs/hr must demonstrate compliance with the AGC/SGC. The facility performed AERMOD modeling demonstrating compliance with the applicable NAAQS and respective SGC/AGC at the fence line of the facility for the contaminants listed in the permit application.

6 NYCRR 212-2.1(b): For any air contaminant not listed on 6 NYCRR 212-2.2 table 2, unless it is a solid particulate described in 6 NYCRR 212-2.1(c) of this section, the facility owner or operator shall not allow emissions of an air contaminant to violate the requirements specified in subdivision 212-2.3(a), table 3 – degree of air cleaning required for criteria air contaminants of this Subpart, or subdivision 212-2.3(b), table

4 – degree of air cleaning required for non-criteria air contaminants of this Subpart, as applicable, for the environmental rating assigned to the contaminant by the department.

The ammonia group, which contains compounds rated C only, requires 75% control from the Fab Ammonia and WWT Ammonia exhausts according to Table 4. This level of control will be achieved by the fab ammonia scrubbers and WWT ammonia scrubbers, which are projected to provide 98% control of ammonia based on available vendor information.

6 NYCRR 212-1.5(d): In accordance with 6 NYCRR 212-1.5(d), Micron provided a Toxic - Best Available Control Technology (T-BACT) assessment of the achievable degree of air cleaning reduction for nitrous oxide. The assessment concluded that operation of process equipment exhaust conditioners (PEECs) on thin films process tools, which provide incidental reduction of nitrous oxide, qualifies as T-BACT. PEECs will be operated at all times when thin films process tools utilizing nitrous oxide are in use.

6 NYCRR 212-2.1(c): For a solid particulate assigned an environmental rating of B or C emitted from a process emission source, the facility owner or operator shall not allow emissions of particulate to exceed the requirements specified in 6 NYCRR 212-2.4.

6 NYCRR 212-2.3: For emission sources subject to VOC RACT per 6 NYCRR 212-3.1(f), the facility will comply with VOC RACT by virtue of compliance with VOC LAER, the more stringent regulatory framework.

6 NYCRR 212-3.1(f): The facility is a major source of NO_x and is subject to the Reasonably Achievable Control Technology (RACT) requirements of 6 NYCRR 212-3 for process emission sources subject to 6 NYCRR 212. Compliance with RACT is achieved through compliance with applicable Lowest Achievable Emission Rate (LAER) requirements.

6 NYCRR 212-3.1(f): The facility is a major source of VOC and is subject to the Reasonably Achievable Control Technology (RACT) requirements of 6 NYCRR 212-3 for process emission sources subject to 6 NYCRR 212. Compliance with RACT is achieved through compliance with applicable Lowest Achievable Emission Rate (LAER) requirements.

6 NYCRR 225-1.2(d): Owners and/or operators of any emission source that fires distillate oil are limited to the firing of distillate oil with 0.0015 percent sulfur by weight or less. Compliance with the sulfur in-fuel limitation is based on fuel vendor receipts. All fuel vendor receipts must be maintained on site or at a Department-approved alternative location for a minimum of five years.

6 NYCRR 227-1.4: No owner or operator shall operate a stationary combustion installation which exhibits greater than 20 percent opacity (6-minute average), except for one 6-minute period per hour of not more than 27 percent opacity. The owner or operator will conduct a Method 9 test annually on the boilers and water bath vaporizers. A report of the results of the test will be submitted to the Department within 30 days of the completion of the Method 9 test. All records generated by the permittee must be maintained for a minimum of five years.

6 NYCRR 227-2.4(c): The facility is a major source of NO_x and is subject to the RACT requirements of 6 NYCRR 227-2 for combustion installations. Mid-sized boilers firing only natural gas must comply with the emission limit of 0.05 pounds NO_x per million Btu.

NO_x emissions must be measured through performance testing. The facility must:

- (1) submit a compliance test protocol to the department for approval at least 30 days prior to emission testing. The conditions of the testing and the locations of the sampling devices must be acceptable to the department;
- (2) follow the procedures set forth in 6 NYCRR Part 202 and use method 7, 7E, or 19 from 40 CFR part 60, appendix A (see 6 NYCRR 200.9 Table 1), or any other method acceptable to the department and the administrator; and
- (3) submit a compliance test report containing the results of the emission test to the department for approval no later than 60 days after completion of the emission test.

6 NYCRR 229-3(e)(2)(iv): For external floating roof volatile organic liquid tanks with a capacity greater than or equal to 10,000 gallons but less than 20,000 gallons, each tank must be equipped with submerged fill.

6 NYCRR 229-3(e)(2)(v): For external floating roof volatile organic liquid tanks with a capacity of less than 10,000 gallons, each tank must be equipped with conservation vents.

6 NYCRR 231-5.4 (Boilers): The facility is a major source subject to the Lowest Achievable Emission Rate (LAER) requirements of 6 NYCRR 231-5.4. NO_x emissions are limited to 9 ppmvd at 3% O₂ for compliance with LAER, achieved through good combustion and maintenance practices.

6 NYCRR 231-5.4 (WBVs): The facility is a major source subject to the Lowest Achievable Emission Rate (LAER) requirements of 6 NYCRR 231-5.4. NO_x emissions are limited to 50 lbs/MMscf for compliance with LAER, achieved through good combustion and maintenance practices.

6 NYCRR 231-5.4 (Em. Gen.): The facility is a major source subject to the Lowest Achievable Emission Rate (LAER) requirements of 6 NYCRR 231-5.4. NO_x emissions are limited to 0.67 g/kW-hr (Tier 4 Final Emission Standards), for compliance with LAER, achieved through good combustion and maintenance practices.

6 NYCRR 231-5.4 (Fire Pump): The facility is a major source subject to the Lowest Achievable Emission Rate (LAER) requirements of 6 NYCRR 231-5.4. NO_x emissions are limited to 4.0 g/kW-hr (Tier 3 Emission Standards), achieved through good combustion and maintenance practices.

6 NYCRR 231-5.4 (Semi & PEEC – FC1 (TFD01), FC2 (TFD02)): The facility is a major source subject to the Lowest Achievable Emission Rate (LAER) requirements of 6 NYCRR 231-5.4. NO_x emissions are limited to 13.1 lb/hr per Fab or a minimum destruction and removal efficiency of 90% when the inlet concentration is 46.1 ppmv or above. LAER is achieved through good combustion and maintenance practices for the PEECs and wet scrubbing of NO₂. Emissions testing for NO_x shall be conducted once every five years.

6 NYCRR 231-5.4 (Semi & PEEC – FA1 (PLE01), FS1 (PHO01, WET01), FA2 (PLE02), FS2 (PHO02, WET02)): The facility is a major source subject to the Lowest Achievable Emission Rate (LAER) requirements of 6 NYCRR 231-5.4. LAER is achieved through good combustion practices for the PEECs. Emissions testing for NO_x shall be conducted once every five years.

6 NYCRR 231-5 (NO_x LAER Total Limit): NO_x emissions are limited to 357.2 tons per year. Records for demonstration of compliance with the NO_x emission limit shall be maintained on site for 5 years.

6 NYCRR 231-5.4 (Boilers): The facility is a major source subject to the Lowest Achievable Emission Rate (LAER) requirements of 6 NYCRR 231-5.4. VOC emissions are limited to 0.0017 lb/MMBtu for LAER compliance, achieved through good combustion and maintenance practices.

6 NYCRR 231-5.4 (WBVs): The facility is a major source subject to the Lowest Achievable Emission Rate (LAER) requirements of 6 NYCRR 231-5.4. LAER is 0.0054 lb/MMBtu for LAER compliance, achieved through good combustion and maintenance practices.

6 NYCRR 231-5.4 (Em. Gen.): The facility is a major source subject to the Lowest Achievable Emission Rate (LAER) requirements of 6 NYCRR 231-5.4. VOC emissions are limited to 0.19 g/kW-hr (Tier 4 Final Emission Standards) for LAER compliance, achieved through good combustion and maintenance practices.

6 NYCRR 231-5.4 (Fire Pump): The facility is a major source subject to the Lowest Achievable Emission Rate (LAER) requirements of 6 NYCRR 231-5.4. VOC emissions are limited to 4.0 g/kW-hr (Tier 3 Emission Standards) for LAER compliance, achieved through good combustion and maintenance practices.

6 NYCRR 231-5.4 (Semi & PEEC): The facility is a major source subject to the Lowest Achievable Emission Rate (LAER) requirements of 6 NYCRR 231-5.4. LAER is achieved through compliance with the following destruction and removal efficiencies and/or concentration-based limits:

- ▶ $\geq 98.5\%$ destruction/recovery efficiency if inlet VOC $\geq 2,000$ ppmv*;
- ▶ $\geq 97\%$ efficiency if inlet VOC ≥ 200 to $< 2,000$ ppmv*;
- ▶ $\geq 90\%$ efficiency if inlet VOC < 200 ppmv*; or
- ▶ ≤ 10 parts per ppmv* at outlet.

**ppmv measured as methane.*

Emissions testing for VOC shall be conducted once every five years.

6 NYCRR 231-5.4 (HTFs): The facility is a major source subject to the Lowest Achievable Emission Rate (LAER) requirements of 6 NYCRR 231-5.4. LAER is achieved through good design and maintenance practices, including regular evaluation of consumption records to confirm efficient usage, evaluation of transfer lines and equipment to identify areas of potential inefficient use, and maintenance and repair of those areas.

6 NYCRR 231-5.4 (Lab Process): The facility is a major source subject to the Lowest Achievable Emission Rate (LAER) requirements of 6 NYCRR 231-5.4. LAER is achieved through good operating and maintenance practices.

6 NYCRR 231-5.4 (VOL Storage Tanks – 1-HPMCU (HS1, HS2), 2-HPMCU (HS3, HS4)): The facility is a major source subject to the Lowest Achievable Emission Rate (LAER) requirements of 6 NYCRR 231-5.4. LAER is achieved through a minimum of 95% overall reduction of VOC emissions from the tanks. Tanks will be efficiently designed and equipped with submerged fill devices and conservation vents. Tanks will be located inside or, if located outside, will be light colored. Additionally, to achieve compliance with LAER, the tanks will be routed to an RCTO control device.

6 NYCRR 231-5.4 (VOL Storage Tanks – 1-HPMCU (HB1, HB2), 2-HPMCU (HB3, HB4), 1-FABOP (FB1), 2-FABOP (FB2)): The facility is a major source subject to the Lowest Achievable Emission Rate (LAER) requirements of 6 NYCRR 231-5.4. LAER is achieved through a minimum of 95% overall reduction of VOC emissions from the tanks. Tanks will be efficiently designed and equipped with submerged fill devices

and conservation vents. Tanks will be located inside or, if located outside, will be light colored. Additionally, to achieve compliance with LAER, the tanks will be routed to ammonia scrubbers.

6 NYCRR 231-5.4 (Waste VOL Storage Tanks – 1-FABOP (FS1), 2-FABOP (FS2)): The facility is a major source subject to the Lowest Achievable Emission Rate (LAER) requirements of 6 NYCRR 231-5.4. LAER is achieving a 95% overall reduction of VOC emissions from the tanks. Tanks will be efficiently designed and equipped with nitrogen blanketing, conservation vents, and adequately sized pressure relief valves so there are expected to be no emissions except for during upset conditions. These practices would minimize emissions of hazardous wastes with organic concentrations of at least 10 percent from storage tanks and equipment.

6 NYCRR 231-5.4 (WWTP): The facility is a major source subject to the Lowest Achievable Emission Rate (LAER) requirements of 6 NYCRR 231-5.4. LAER is waste minimization and efficient design, including the biodegradation of VOC in the wastewater stream through the use of a biological treatment unit.

6 NYCRR 231-5 (VOC LAER Total Limit): VOC emissions are limited to 205.7 tons per year. Records for demonstration of compliance with the VOC emission limit shall be maintained on site for 5 years.

6 NYCRR 231-7.6 (Boilers): The facility is a major source subject to the Best Available Control Technology (BACT) requirements of 6 NYCRR 231-7.6. CO emissions are limited to 50 ppmvd at 3% O₂ for BACT compliance, achieved through good combustion and maintenance practices.

6 NYCRR 231-7.6 (WBVs): The facility is a major source subject to the Best Available Control Technology (BACT) requirements of 6 NYCRR 231-7.6. CO emissions are limited to 84 lbs/MMscf for BACT compliance, achieved through good combustion and maintenance practices.

6 NYCRR 231-7.6 (Em. Gen.): The facility is a major source subject to the Best Available Control Technology (BACT) requirements of 6 NYCRR 231-7.6. CO emissions are limited to 3.5 g/kW-hr (Tier 4 Final Emission Standards) for BACT compliance, achieved through good combustion and maintenance practices.

6 NYCRR 231-7.6 (Fire Pump): The facility is a major source subject to the Best Available Control Technology (BACT) requirements of 6 NYCRR 231-7.6. CO emissions are limited to 3.5 g/kW-hr (Tier 3 Emission Standards) for BACT compliance, achieved through good combustion and maintenance practices.

6 NYCRR 231-7.6 (Semi & PEEC – FA1 (PLE01), FA2 (PLE02)): The facility is a major source subject to the Best Available Control Technology (BACT) requirements of 6 NYCRR 231-7.6. CO emissions are limited to 0.03 lbs/hr per Fab or 184.2 lbs/yr per Fab for BACT compliance. BACT is achieved through good combustion and maintenance practices for the PEECs. Emissions testing for CO shall be conducted once every five years.

6 NYCRR 231-7 (CO BACT Total Limit): CO emissions are limited to 1,410 tons per year. Records for demonstration of compliance with the CO emission limit shall be maintained on site for 5 years.

6 NYCRR 231-7.6 (Boilers): The facility is a major source subject to the Best Available Control Technology (BACT) requirements of 6 NYCRR 231-7.6. PM emissions are limited to 7.6 lb/MMscf for BACT compliance, achieved through good combustion and maintenance practices.

6 NYCRR 231-7.6 (WBVs): The facility is a major source subject to the Best Available Control Technology (BACT) requirements of 6 NYCRR 231-7.6. PM emissions are limited to 7.6 lb/MMscf for BACT compliance, achieved through good combustion and maintenance practices.

6 NYCRR 231-7.6 (Em. Gen.): The facility is a major source subject to the Best Available Control Technology (BACT) requirements of 6 NYCRR 231-7.6. PM emissions are limited to 0.008 g/kW-hr for BACT compliance, achieved through good combustion and maintenance practices.

6 NYCRR 231-7.6 (Fire Pump): The facility is a major source subject to the Best Available Control Technology (BACT) requirements of 6 NYCRR 231-7.6. PM emissions are limited to 0.20 g/kW-hr (Tier 3 Emission Standards) for BACT compliance, achieved through good combustion and maintenance practices.

6 NYCRR 231-7.6 (Semi & PEEC – FC1 (TFD01), FC2, (TFD02)): The facility is a major source subject to the Best Available Control Technology (BACT) requirements of 6 NYCRR 231-7.6. BACT is an 82% total PM reduction achieved through the operation of ionizing wet scrubbers when the inlet concentration is 0.22 ppmv or above. Emissions testing for PM shall be conducted once every five years.

6 NYCRR 231-7.6 (Semi & PEEC – FA1 (PLE01, IMP01, WET01), FA2 (PLE02, IMP02, WET02)): The facility is a major source subject to the Best Available Control Technology (BACT) requirements of 6 NYCRR 231-7.6. BACT is the use of mist eliminators on the acid scrubbers along with good combustion and maintenance practices for the PEECs. Emissions testing for PM shall be conducted once every five years.

6 NYCRR 231-7.6 (Semi & PEEC – FB1, PHO01, CMP01, FB2, PHO02, CMP02): The facility is a major source subject to the Best Available Control Technology (BACT) requirements of 6 NYCRR 231-7.6. BACT is the use of mist eliminators on the ammonia scrubbers along with good combustion and maintenance practices for the PEECs. Emissions testing for PM shall be conducted once every five years.

6 NYCRR 231-7.6 (Semi & PEEC – FS1, PHO01, FS2, PHO02): The facility is a major source subject to the Best Available Control Technology (BACT) requirements of 6 NYCRR 231-7.6. BACT is achieved through good combustion practices for the PEECs. Emissions testing for PM shall be conducted once every five years.

6 NYCRR 231-7.6 (Cooling Towers): The facility is a major source subject to the Best Available Control Technology (BACT) requirements of 6 NYCRR 231-7.6. BACT is achieved through venting emissions to a drift eliminator with a maximum drift rate of 0.0005%. Additionally, the total dissolved solids (TDS) content of the cooling water will be maintained at a maximum of 1,200 mg/L.

6 NYCRR 231-7.6 (Bulk Material Storage Silos): The facility is a major source subject to the Best Available Control Technology (BACT) requirements of 6 NYCRR 231-7.6. PM emissions will be vented to a fabric filter with a maximum outlet grain loading of 0.005 grains/dscf for BACT compliance.

6 NYCRR 231-7.6 (Vehicle Traffic Dust Emissions): The facility is a major source subject to the Best Available Control Technology (BACT) requirements of 6 NYCRR 231-7.6. BACT is achieved through surface improvements (e.g., paving) and the implementation of speed limits for on-site traffic. Where paving on-site roads is not feasible, the facility will conduct periodic watering.

6 NYCRR 231-7.6 (Wastewater Treatment Process): The facility is a major source subject to the Best Available Control Technology (BACT) requirements of 6 NYCRR 231-7.6. BACT is achieved through waste minimization and efficient design.

6 NYCRR 231-7 (PM BACT Total Limit): PM emissions are limited to 77.6 tons per year, PM₁₀ emissions are limited to 68.7 tons per year, and PM_{2.5} emissions are limited to 55.9 tons per year. Records for demonstration of compliance with the PM emission limit shall be maintained on site for 5 years.

6 NYCRR 231-7.6 (Boilers): The facility is a major source subject to the Best Available Control Technology (BACT) requirements of 6 NYCRR 231-7.6. CO₂ emissions are limited to 117 lb/MMBtu (AP-42, Chapter 1.4, July 1998), achieved through efficient design and combustion practices.

6 NYCRR 231-7.6 (WBVs): The facility is a major source subject to the Best Available Control Technology (BACT) requirements of 6 NYCRR 231-7.6. CO₂ emissions are limited to 117 lb/MMBtu (AP-42, Chapter 1.4, July 1998), achieved through good combustion and maintenance practices.

6 NYCRR 231-7.6 (Em. Gen.): The facility is a major source subject to the Best Available Control Technology (BACT) requirements of 6 NYCRR 231-7.6. CO₂ emissions are limited to 163 lb/MMBtu (40 CFR Part 98, Subpart C, April 2024), achieved through efficient design and combustion practices.

6 NYCRR 231-7.6 (Fire Pump): The facility is a major source subject to the Best Available Control Technology (BACT) requirements of 6 NYCRR 231-7.6. CO₂ emissions are limited to 163 lbs/MMBtu (40 CFR Part 98, Subpart C, April 2024), achieved through efficient design and combustion practices.

6 NYCRR 231-7.6 (Semi & PEEC – FA1 (PLE01), FA2 (PLE02)): The facility is a major source subject to the Best Available Control Technology (BACT) requirements of 6 NYCRR 231-7.6. BACT is achieved through routing emissions to tool-level thermal oxidation systems certified to meet the default DREs listed in the IPCC's 2019 Revision Table 6.17. In addition, the following work-practice standards will be implemented:

- ▶ Obtain POU control device and RCS supplier DRE certification that states each can at a minimum meet default DREs or higher.
- ▶ Maintain a site maintenance plan that meets the POU control device and RCS supplier's installation, operation, and maintenance requirements.
- ▶ Track uptime of POU control devices and RCS when fab processes are running. DRE is assumed 0% (unless demonstrated otherwise) when POU control device is not running per site maintenance plan while process is running.
- ▶ Certify annually that each POU control device and RCS claiming default DRE followed the site maintenance plan.

6 NYCRR 231-7.6 (Semi & PEEC – FA1 (WET01), FA2 (WET02)): The facility is a major source subject to the Best Available Control Technology (BACT) requirements of 6 NYCRR 231-7.6. BACT will be achieved through the efficient utilization of GHG-containing raw materials, including optimizing tool operating cycles and efficient utilization of process chemicals. In addition, the Facility will comply with the manufacturer's recommendations for good combustion and maintenance practices.

6 NYCRR 231-7.6 (Semi & PEEC – FC1 (TFD01), FC2 (TFD02)): The facility is a major source subject to the Best Available Control Technology (BACT) requirements of 6 NYCRR 231-7.6. BACT will be achieved through routing emissions to tool-level thermal oxidation systems. The facility will implement practices for the efficient utilization of GHG-containing raw materials, including optimizing tool operating cycles and efficient utilization of process chemicals. For cleaning CVD chambers between production cycles, NF₃ will replace the use of carbon-based F-GHGs except in limited cases where in-situ or thermal cleaning are technically required. In addition, the Facility will comply with the manufacturer's recommendations for good combustion and maintenance practices.

6 NYCRR 231-7.6 (Semi & PEEC – FB1 (CMP01), FB2 (CMP02), FS1 (WET01, PHO01), FS2 (WET02, PHO02), FG1 (GN001 – GN040), FG2 (GN041 – GN080)): The facility is a major source

subject to the Best Available Control Technology (BACT) requirements of 6 NYCRR 231-7.6. BACT will be achieved through compliance with the manufacturer's recommendations for good combustion and maintenance practices.

6 NYCRR 231-7.6 (HTFs): The facility is a major source subject to the Best Available Control Technology (BACT) requirements of 6 NYCRR 231-7.6. BACT is achieved through good design and maintenance practices, including regular evaluation of consumption records to confirm efficient usage, evaluation of transfer lines and equipment to identify areas of potential inefficient use, and maintenance and repair of those areas.

6 NYCRR 231-7.6 (Circuit Breakers): The facility is a major source subject to the Best Available Control Technology (BACT) requirements of 6 NYCRR 231-7.6. BACT will be achieved through the installation of manufacturer-guaranteed circuit breakers with SF₆ leak rates less than 0.5% and the use of leak detection systems (with alarms).

6 NYCRR 231-7 (GHG BACT Total Limit): GHG emissions are limited to 1,090,018 tons per year of CO_{2e} (100-yr GWP). Records for demonstration of compliance with the VOC emission limit shall be maintained on site for 5 years.

6 NYCRR 257-4: No person shall permit, suffer or allow the emission of fluorides, as defined in 6 NYCRR 257-4.1, from an emission source which alone or in combination with emissions from other sources cause contravention of the air quality standards promulgated in 6 NYCRR 257-4.2.

The facility performed AERMOD modeling demonstrating compliance with the applicable standards at the fence line of the facility for fluorides as described in the permit application.

6 NYCRR 257-5: No person shall permit, suffer, or allow the emission of hydrogen sulfide from an emission source which alone or in combination with emissions from other sources cause contravention of air quality standards promulgated in 6 NYCRR Part 257-5.

In any one-hour period, the average concentration of hydrogen sulfide shall not exceed 0.010 ppm (14 µg/m³). The facility has demonstrated compliance with this standard through air dispersion modeling. Compliance will be reevaluated during permit modifications, as appropriate.

6 NYCRR 494-1.4(e): No person may install a field charged system in New York State, nor have any such system be installed through their position as a designer, owner, or operator of that system, in the following sectors or subsectors that use a prohibited substance as listed in the tables in subdivision 6 NYCRR 494-1.4(e) after the prohibition date indicated.

6 NYCRR 494-1.4(e): Effective one year after the prohibition date, no person may sell, distribute, offer for sale or distribution, make available for sale or distribution, purchase or receive for sale or distribution, or attempt to purchase or receive for sale or distribution in New York State any product that uses a prohibited substance as listed in the tables in subdivision 6 NYCRR 494-1.4(e).

6 NYCRR 494-1.4(f): No person may manufacture, sell, distribute, offer for sale or distribution, make available for sale or distribution, purchase or receive for sale or distribution, or attempt to purchase or receive for sale or distribution in New York State bulk regulated substances as listed in the table in subdivision 6 NYCRR 494-1.4(f) after the prohibition date indicated.

As stated in 6 NYCRR 494-1.1, the purpose of Part 494 is to “adopt prohibitions and controls for hydrofluorocarbons and other greenhouse gases in air conditioning and refrigeration equipment, aerosol products, and foam subsectors”. Therefore, the prohibitions in 6 NYCRR 494-1.4(f) do not apply to hydrofluorocarbons used as etch gases in semiconductor manufacturing. As required by 40 CFR 84, Micron has obtained, and will continue to obtain, application-specific allowances for use of HFC gases in semiconductor manufacturing.

6 NYCRR 494-2.2: The requirements of this condition apply to any owner or operator of commercial stationary refrigeration or air conditioning equipment with a refrigerant charge capacity greater than or equal to 50 (fifty) pounds of a regulated substance.

Any owner or operator of refrigeration or air conditioning equipment containing regulated substances in the subsectors listed in section 6 NYCRR 494-1.4 that exceeds the compliance threshold indicated in the table in 6 NYCRR 494-2.2(a) must register with the department by completing the applicable registration in 6 NYCRR 494-2.2(b) and labeling actions in 6 NYCRR 494-2.2(c) by the compliance date specified.

6 NYCRR 494-2.3: The owner or operator of refrigeration or air conditioning equipment in the subsectors listed in section 6 NYCRR 494-1.4 that exceeds the compliance threshold indicated in the table in 6 NYCRR 494-2.3(a) and is operated year-round, must conduct the associated leak management protocols in accordance with the frequency specified.

For Large Refrigeration Equipment, an automatic leak detection system must be installed within 30 days of installation. Per the April 23, 2025 enforcement discretion letter issued by the Department, installation of automatic leak detection is only for portions of regulated equipment systems where it is feasible before December 31, 2027 or such date as may be specified in a promulgated amendment to 6 NYCRR 494-2.3(d)(5), whichever is earlier.

Leak inspections must be conducted by the owner or operator of the regulated equipment outlined in 6 NYCRR 494-2.3(a) using a calibrated leak detection device or bubble test at the following intervals and under these conditions:

- ▶ (1) at the frequency outlined in 6 NYCRR 494-2.3(a);
- ▶ (2) when adding additional regulated substance amounts equal to or greater than five (5) pounds or one (1) percent of the refrigerant charge capacity of the regulated equipment; and
- ▶ (3) when oily residue is observed on any refrigerant circuit indicating a refrigerant leak.

Leak detection inspections must be completed in accordance with 6 NYCRR 494-2.3(c), unless components are continuously monitored by an automatic leak detection system that meets the requirements of 6 NYCRR 494-2.3(d).

For regulated equipment listed in 6 NYCRR 494-2.3(a) that is not operated year-round, the owner or operator must conduct a leak inspection within 30 days after starting each operation, and once every three months thereafter until the regulated equipment is shut down. The leak inspection must be conducted using a calibrated leak detection device or bubble test.

The requirements of this condition do not apply during the time that regulated equipment is undergoing mothballing. The requirements of this condition apply on the day the regulated equipment resumes operation after mothballing.

6 NYCRR 494-2.4: The owner or operator of refrigeration or air conditioning equipment subject to the leak detection requirements must ensure that all detected leaks are repaired by a certified technician within 14 days of its detection, except when a longer time period is allowed under 6 NYCRR 494-2.4(c) or (d). Initial and follow up verification tests shall be completed according to 6 NYCRR 494-2.4(e), (f), and (g).

The requirements of this condition do not apply during the time that a refrigeration or air conditioning equipment is undergoing mothballing. The requirements of this condition apply on the day the equipment resumes operation after mothballing.

6 NYCRR 494-2.6: The owner or operator of refrigeration or air conditioning equipment in the subsectors listed in section 6 NYCRR 494-1.4 that exceeds the compliance threshold indicated in the table in 6 NYCRR 494-2.6(a) must submit an annual facility stationary refrigeration or air conditioning report (annual report) in a manner determined by the department each year starting with the deadline specified in the table in 6 NYCRR 494-2.6(a) and then annually thereafter. The annual report must include the information in 6 NYCRR 494-2.6(b). Records shall be kept in accordance with 6 NYCRR 494-2.7.

6 NYCRR 495-1.4: Starting on the applicable phase-out dates and per the gas-insulated equipment characteristics jointly provided in 6 NYCRR 495-1.4(b)-(c), no person may acquire SF6 gas-insulated equipment for use in New York State unless one of the following provisions apply:

- ▶ (1) An SF6 phase-out exemption was approved by the department or SF6 gas-insulated equipment was acquired in response to a failure, pursuant to 6 NYCRR 495-1.10.
- ▶ (2) The SF6 gas-insulated equipment device was ordered for installation and was either reported to the department pursuant to 6 NYCRR 495-1.8(a) or was the property of a gas-insulated equipment owner registered per 6 NYCRR 495-1.8(b) prior to the applicable phase-out date listed in 6 NYCRR 495-1.4(b)-(c).
- ▶ (3) A defective SF6 gas-insulated equipment device is replaced under the terms of the manufacturer's warranty.

Replacement parts are not subject to the phase-out dates provided in 6 NYCRR 495-1.4(b)-(c). Any SF6 gas-insulated equipment device ordered by the gas-insulated equipment Owner prior to the applicable phase-out date listed in 6 NYCRR 495-1.4(b)-(c) must be installed (i.e., connected to an electrical power system) no later than 24 months after the date of delivery to the gas-insulated equipment Owner, except for spare gas-insulated equipment.

6 NYCRR 495-1.5: Beginning January 1, 2030, a gas-insulated equipment owner's rolling 3-year average gas-insulated equipment emissions as calculated pursuant to 6 NYCRR 495-1.7(a)-(c) and subject to department approval per 6 NYCRR 495-1.8, cannot exceed their emissions limit calculated per 6 NYCRR 495-1.5(b)-(g). The department will evaluate compliance with the emissions limit through the reporting requirements described in 6 NYCRR 495-1.8. A gas-insulated equipment owner may request emissions from an emergency event to be exempted from the calculation of the gas-insulated equipment owner's annual gas-insulated equipment emissions in accordance with 6 NYCRR 495-1.11.

6 NYCRR 495-1.6: Beginning January 1, 2027, gas-insulated equipment owners must establish and maintain a current and complete gas-insulated equipment inventory of each gas-insulated equipment device that uses a covered insulating gas including the information in 6 NYCRR 495-1.6(a).

As of January 1, 2027, gas-insulated equipment owners must establish and maintain a current and complete inventory of all covered gas containers and gas carts that contain covered insulating gas as well as covered insulating gas transferred out of gas-insulated equipment devices. This includes gas-insulated equipment

that is “removed from regular use” per 6 NYCRR 495-1.6(a)(2)(ii). The gas-insulated equipment owner is responsible for ensuring that gas, gas containers, and gas carts are accounted for and that measurement devices are calibrated consistent with the procedures established in sections 95354(b)-(m) of title 17 of the California Code of Regulations incorporated by reference herein, per 6 NYCRR 495-1.15. The information in 6 NYCRR 495-1.6(b) must be included in the inventory.

6 NYCRR 495-1.8: Any gas-insulated equipment owner with annual gas-insulated equipment emissions calculated pursuant to 6 NYCRR 495-1.7(c) exceeding 7,500 metric tons CO₂e must submit an annual gas-insulated equipment emissions report every year by March 31. The report will be submitted in a format to be determined by the department and include data from the previous calendar year. The first year to be reported is 2027 and the first annual report must be submitted by March 31, 2028. A single report must be submitted by each gas-insulated equipment owner regardless of whether their gas-insulated equipment are located in a single physical location or multiple non-contiguous locations within New York State. The report must contain the information in 6 NYCRR 495-1.8(a).

Beginning in calendar year 2028, any gas-insulated equipment owner with annual gas-insulated equipment emissions calculated pursuant to 6 NYCRR 495-1.7(c) that does not exceed 7,500 metric tons CO₂e must register with the department. The deadline for registration is March 31, 2028, otherwise March 31 of subsequent calendar years. This includes gas-insulated equipment owners that previously submitted an annual gas-insulated equipment emissions report per 6 NYCRR 495-1.8(a) but for whom annual gas-insulated equipment emissions no longer exceed 7,500 metric tons CO₂e. The registration will include gas-insulated equipment owner information per 6 NYCRR 495-1.8(a)(1)-(4), emissions information per 6 NYCRR 495-1.8(a)(6), and an appropriate attestation statement per 6 NYCRR 495-1.8(c) that the gas-insulated equipment owner’s emissions do not exceed the 7,500 metric tons CO₂e threshold. The registration information provided must match the records retained by the gas-insulated equipment owner pursuant to 6 NYCRR 495-1.9.

Gas-insulated equipment owners must retain the records in 6 NYCRR 495-1.9(a) for five years and upon request, provide these records to the department within 30 days of the request.

6 NYCRR 495-1.8(d)SF6 (Facility-Wide): Within 30 days of the authorized representative of a gas insulated equipment owner being relieved of their duties, the owner must appoint a new authorized representative and notify the Department of the change. The notification must include the name, official title, mailing address, phone number, and email address of the new authorized representative.

New York State Department of Environmental Conservation

Air Permit Application



DEC ID									

Methods Used to Determine Compliance			
Emission Unit ID	Applicable Requirement	Method Used to Determine Compliance	Compliance Date
Multiple	40 CFR 63.7184	Stack test according to plan in Appendix T (see also Table 3-1 of application)	See App T
Multiple	40 CFR 63.7187	Continuous monitoring of RCTOs and acid scrubbers - methods to be determined in site-specific monitoring plan	See App T
All	6 NYCRR 257-7	Air dispersion modeling against H2S ambient air quality standards	Modeling Report Submittal
1-CMBOP 2-CMBOP	6 NYCRR 201-7.1	Continuous hour meters will be installed on all emergency engines. Records of operation hours for boilers and WBVs will be maintained.	Upon Installation
1-CMBOP 2-CMBOP	6 NYCRR 227-1.4	Annual method 9 test on each boiler and WBV	Annual
1-CMBOP 2-CMBOP	6 NYCRR 227-2	Initial NOx performance test for each boiler	180 days after startup
1-FABOP 2-FABOP	6 NYCRR 231	Periodic testing against BACT/LAER limits for NOx, PM, CO, and VOC. Work practice standards for GHG.	Every 5 years
Multiple	6 NYCRR 212	Air dispersion modeling against SGC and AGC standards	Modeling Report Submittal
All	6 NYCRR 257-4	Air dispersion modeling against fluorides ambient air quality standards	Modeling Report Submittal
1-CMBOP 2-CMBOP	40 CFR 63.7540	Annual tune-up of each boiler and WBV	Annual

New York State Department of Environmental Conservation

Air Permit Application



DEC ID									

Methods Used to Determine Compliance			
Emission Unit ID	Applicable Requirement	Method Used to Determine Compliance	Compliance Date
1-CMBOP 2-CMBOP	40 CFR 60.48c	Initial notification and recordkeeping for boilers and WBVs	Upon Startup
1-CMBOP 2-CMBOP	40 CFR 60.4205 40 CFR 60.4207 40 CFR 60.4211	Purchasing compliant engines, meeting fuel requirements, operating according to specifications	Upon Startup
1-CMBOP 2-CMBOP	40 CFR 63.6590	Compliance with 40 CFR Subpart IIII	Upon Startup
1-FABOP 2-FABOP	6 NYCRR 226-2	Compliance with VOC LAER	Upon Startup
Multiple	6 NYCRR 229.3(e)(2)	Installation of conservation vents or implementation of submerged fill, as applicable	Upon Startup
Multiple	6 NYCRR 494	Labeling and registration of equipment, automatic leak detection and/or periodic leak inspections as applicable	Variable
Multiple	6 NYCRR 495	Maintaining equipment inventory, compliance with phaseout dates based on equipment size	Variable

Micron Edits to DEC's Proposed Operational Flexibility Protocol for Inclusion in Micron's Title V Permit

July 15, 2025

I. Protocol Objective

The objective of this condition is to enable operational flexibility (OpFlex) at the facility by building the capability to make certain changes pursuant to this protocol into the Title V permit. As provided under 6 NYCRR Part 201-6.4(f), changes made under an approved protocol are not subject to the Title V permit modification provisions under 6 NYCRR Section 201-6.6 unless required by the Department pursuant to 201-6.4(f)(4).

II. Protocol

A. Criteria

Changes reviewed under this protocol shall be evaluated in accordance with the following criteria:

1. All underlying federal and state requirements applicable to the new or changed operation or emission source must be included in the Title V permit. Existing permit conditions may be amended to reference or include the new or changed operation or emission source and any related information, and/or, subject to the Department's approval, new conditions proposed, to provide the appropriate monitoring parameters.
2. Any new or changed emission source shall not be part of a source project that results in a significant net emission increase that exceeds the New Source Review (NSR) thresholds identified in 6 NYCRR Part 231.
3. The facility owner or operator shall not use the protocol to make physical changes or changes in the method of operation of existing emissions sources that would require a new or modified federally enforceable emissions cap or other case-by-case determination. Such changes must be addressed via the significant permit modification provisions in 6 NYCRR Section 201-6.6.
4. Contaminants subject to the air dispersion modeling requirements of 6 NYCRR Part 212 without an annual guideline concentration (AGC) listed in the DAR-1 guidance shall be evaluated as described in Section II.B below, if the contaminants' toxicity is determined to be "high" according to the criteria outlined in DAR-1, page 29, or if the predicted offsite concentrations for non-"high" toxicity contaminants are above **0.03 µg/m³** (30% of the de minimis limit for compounds not assigned a "high" toxicity rating). Note that a "high" toxicity rating is equivalent to an environmental rating of "A", according to DAR-1, page 9.
5. Contaminants subject to the air dispersion modeling requirements of 6 NYCRR Part 212 with an annual guideline concentration (AGC) listed in the DAR-1 guidance document shall

be evaluated as described in Section II.B below, if the predicted offsite concentrations are above **30% of the applicable AGC**.

B. Notification Requirements for Changes Reviewed under the Protocol

1. When advance notification of a change is required under this protocol, the facility owner or operator shall submit written notification of each change to the Department either electronically or by letter at least 15 days in advance of making the proposed change. The facility owner or operator may include more than one proposed change in each notification submitted.
2. Notifications made in accordance with this protocol must include the following information:
 - a. Identification of the Title V permit emission unit, process(es), emission source(s) and emission point(s) affected by the proposed change with applicable revisions to the Emission Unit structure;
 - b. Description of the proposed change, including operating parameters affected;
 - c. Identification and description of emissions control device or technology that will be used; and
 - d. Documentation of the project's, or emission source's, compliance with respect to all applicable state and/or federal requirements, including the following:
 - i. Calculations demonstrating the emission rate potential and maximum projected annual actual emission rates for all contaminants affected by the change;
 - ii. Documentation demonstrating that the change is not subject to the New Source Review requirements described in 6 NYCRR Part 231;
 - iii. Identification and evaluation of all state and federal regulations applicable to the proposed change;
 - iv. A description of any additional operating and recordkeeping procedures necessary to ensure compliance with all applicable requirements; and
 - v. Any other relevant information used for the evaluation of the proposed change under this protocol.
 - e. The following additional information for changes subject to air dispersion modeling under 6 NYCRR Parts 212 or 257:

- i. Results of dispersion modeling conducted pursuant to the most recent approved modeling protocol and the DAR-10 guidance document that demonstrate the maximum predicted offsite concentrations are less than the applicable SGC, AGC, and/or meet the State Standards set forth in 6 NYCRR Part 257, for each air contaminant associated with the change. Modeling conducted pursuant to this provision shall include existing facility-wide emissions of each air contaminant associated with the change (including existing analogous air contaminants) plus the additional emissions resulting from the change.
- ii. A proposed environmental rating for each contaminant associated with the change and a description of the methods that will be used to comply with the applicable portions of 6 NYCRR Part 212 for the environmental rating and emission rate potential of each contaminant.
- iii. Any other relevant information used for the evaluation of the proposed project or emission source under the Protocol.
- iv. Changes involving air contaminants without an AGC listed in the DAR-1 guidance document shall be evaluated as follows:
 1. The notification required by Item B.1 of this protocol shall include the Chemical Name and Chemical Abstract Series Number (CAS Number) for each such compound and a request for the Department to develop appropriate guideline concentrations.
 2. For high toxicity air contaminants identified by criteria in DAR-1 (page 29) based on published toxicity studies, if the projected annual actual emissions of each air contaminant are greater than 0.1 pounds per year (or the mass emission limit in Table 2 of Part 212-2.2 for high toxicity air contaminants) or for all other air contaminants a threshold of 100 lbs/yr applies, then the facility owner or operator shall perform dispersion modeling pursuant to the most recent approved modeling protocol and the DAR-10 guidance document to demonstrate that the maximum predicted offsite concentrations of each air contaminant associated with the change are less than the *de minimis* of $2.0 \times 10^{-5} \mu\text{g}/\text{m}^3$ for high toxicity air contaminants and $0.1 \mu\text{g}/\text{m}^3$ for all other compounds, as specified in the DAR-1 guidance document.
 3. The facility owner or operator may propose an interim SGC and/or AGC as part of the notification required by Item B.1 of this protocol and provide modeling results demonstrating compliance with that value for the Department's consideration and subsequent approval.

Such SGC and/or AGC values shall be derived using the procedures outlined in the DAR-1 guidance document. In cases where the SGC and/or AGC for the proposed air contaminant was developed using analogous existing permitted air contaminant(s), facility-wide emissions of the analogous contaminant(s) plus the additional emissions resulting from the change shall be modeled. Unless the Department provides a revised SGC and/or AGC within 15 days of receipt of the notification, the proposed SGC and/or AGC (or default, as applicable) is considered approved.

- f. Any other relevant information used for the evaluation of the proposed project or emission source under the Protocol.

C. Review and Approval of Changes

1. The Department shall respond to the facility owner or operator in writing with a determination within 15 days of receipt of the notification required by Section II.B of this protocol. The permittee is authorized to proceed with the proposed change if a written determination from the Department is not provided within 15 days of receipt of the notification.
2. The Department reserves the right to require a permit modification to impose applicable requirements or permit conditions if it determines that changes proposed do not meet the criteria described in Section II.A above, or that the changes may have a significant air quality impact. In such cases, the Department shall require that the facility owner or operator not undertake the proposed changes until a permit modification is issued. The Department's determination shall include a listing of any additional information necessary to complete its review of the proposed changes.

D. Additional Compliance Obligations for Changes Made Under this Protocol

1. Upon commencement of the change, the facility owner or operator shall comply with all applicable requirements and permit conditions, including any amended or proposed in accordance with II.A.1.a above.
2. For changes resulting in predicted offsite concentrations below the thresholds in Sections II(A)(4) and II(A)(5), the facility owner or operator shall provide, with the semiannual monitoring report, a summary of the change made during the monitoring period in accordance with this protocol and a statement of the compliance status of each.
3. The facility owner or operator shall include each change made pursuant to this protocol in the next application for permit modification or renewal, whichever is first. Changes made pursuant to this protocol are not subject to the permit shield provisions described in 6 NYCRR 201-6.4(g) until they are incorporated into the Title V permit.

4. The facility owner or operator shall maintain a record of each change made pursuant to this protocol at the facility for a period of at least five years from the date of the record and shall make such records available to the Department upon request.

APPENDIX T. STACK TEST PLAN

The proposed testing plan would be incorporated in the final Title V permit to demonstrate the accuracy of emission calculations.

1.1 Proposed Stack Testing Plan

As described in Permit Applications 1 and 2, the proposed air permit project will include five (5) exhaust systems in each of the main fab buildings, three (3) exhaust systems in each of the hazardous process material (HPM) buildings, and three (3) exhaust systems in each of the wastewater treatment (WWT) buildings. The fab building exhausts will contain emissions generated from the operation of semiconductor process tools, while the HPM and WWT building exhausts will contain emissions from raw material and waste treatment and storage. The stack testing plan refers to these exhaust types as part of identifying the scope of each proposed test.

- ▶ Fab Acid Exhaust
- ▶ Fab Chemical Vapor Deposition (CVD) Exhaust
- ▶ Fab Ammonia Exhaust
- ▶ Fab Solvent Exhaust
- ▶ Fab General Exhaust
- ▶ HPM Acid Exhaust
- ▶ HPM Ammonia Exhaust
- ▶ HPM Solvent Exhaust
- ▶ WWT Acid Exhaust
- ▶ WWT Ammonia Exhaust
- ▶ WWT Solvent Exhaust

To satisfy regulatory requirements and NYSDEC's comments in an efficient manner, the plan includes tests that will meet each of these goals:

- ▶ Demonstrating compliance with NESHAP Subpart BBBBB;
- ▶ Demonstrating compliance with Best Available Control Technology (BACT) or Lowest Achievable Emission Rate (LAER) permit limits, where applicable, and;
- ▶ Confirming engineering emissions estimates based on semiconductor process knowledge made by Micron and Trinity.

The exhaust systems are designed in such a way to eliminate control unit downtime by combining all exhaust of each type on a common header, one on each half of each fab, with emission control units operating in parallel on each header. Each fab will be built out in four phases with the common headers connecting units in phases 1 and 2 and separately in phases 3 and 4. Given this configuration, emissions are expected to vary little between units on the same header and by extension within each phase. Additionally, all units on each header have been designed to be identical to streamline maintenance activities and operations. Each unit will therefore be operating with very similar critical parameters such as liquid recirculation rate and exhaust flowrate and have the same expected removal efficiencies. This design ensures that there will be little to no variation in emissions between units. As such, Micron proposes testing one unit from each exhaust type per half-Fab during the permit term, for a total of 4 units tested.

Initial performance testing is required within 180 days of startup. Micron does not anticipate reaching full capacity on phase 1 within 180 days due to the extended construction schedule. Micron proposes to test one unit from each exhaust stream in phase 1, once phase 1 has reached 80% buildout. If this does not occur before 180 days, Micron will provide a written justification to the Department for delaying the initial testing.

All tests will limit testing to pollutants that can realistically be sampled using sound testing methods. Each proposed test is summarized in Table T-1 and described in more detail below.

Table T-1: Proposed Tests

Exhaust System	Emission Units	Processes	Pollutant(s) to be Tested Every 5 Years	Pollutant(s) to be Tested Once
Fab Acid Exhaust	1-FABOP 2-FABOP	FA1 FA2	NO _x , CO, VOC, PM	Inorganic HAP, other TBD
Fab CVD Exhaust	1-FABOP 2-FABOP	FC1 FC2	NO _x , CO, VOC, PM	Inorganic HAP, other TBD
Fab Ammonia Exhaust	1-FABOP 2-FABOP	FB1 FB2	-	Inorganic HAP, Organic HAP, ammonia, other TBD
Fab Solvent Exhaust	1-FABOP 2-FABOP	FS1 FS2	NO _x , CO, VOC, PM	Organic HAP, other TBD
Fab General Exhaust	1-FABOP 2-FABOP	FG1 FG2	-	Organic HAP
HPM Acid Exhaust	1-HPMCU 2-HPMCU	HA1 HA2	-	Inorganic HAP
HPM Ammonia Exhaust	1-HPMCU 2-HPMCU	HB1 HB2	-	Inorganic HAP
HPM Solvent Exhaust	1-HPMCU 2-HPMCU	HS1 HS2	-	Inorganic HAP
WWT Acid Exhaust	1-WWBIO 2-WWBIO	WA1 WA2	-	Inorganic HAP
WWT Ammonia Exhaust	1-WWBIO 2-WWBIO	WB1 WB2	-	Inorganic HAP
WWT Solvent Exhaust	1-WWBIO 2-WWBIO	WS1 WS2	-	Inorganic HAP

1.1.1 Stack Testing to Comply with NESHAP Subpart BBBBB

The proposed air permit project will be subject to NESHAP Subpart BBBBB as a semiconductor manufacturing facility that is major source of HAP. Per 40 CFR 63.7187, initial performance testing is required for both inorganic HAP and organic HAP emitted from “semiconductor manufacturing process units” to demonstrate compliance with applicable standards for removal efficiency or outlet concentration. According to 40 CFR 63.7186, the required performance tests must be completed within 180 days of startup. Micron proposes to consider “startup” of each subject exhaust header to be the date on which the processes routing to the exhaust header begins full operation.

Table 3-1 of [Permit Application 2 \(PDF page 54\)](#), replicated as Table T-2 below, identifies the applicable requirement for each exhaust type under NESHAP Subpart BBBBB. An initial performance test will be

completed for each exhaust using the process or storage tank vent stream test methods specified in Table 1 to NESHAP Subpart BBBBB. The fab ammonia exhaust, HPM ammonia exhaust, HPM solvent exhaust, WWT ammonia exhaust, and WWT solvent exhaust, as stated below, will be designed to not contain any inorganic HAP, but could contain trace inorganic HAP due to inadvertent intermingling with acid exhausts. Micron proposes to test these exhausts to demonstrate that they do not contain detectable quantities of inorganic HAP. **Note that NESHAP Subpart BBBBB, as an alternative to percent reduction requirements, regulates concentrations of organic and inorganic HAP at stack outlets, not at any other point upstream.**

Table T-2: Method(s) of Compliance with NESHAP BBBBB by Process and Exhaust Type

Area	Exhaust Type	HAP Emitting Process Unit(s)	Type of Process Vent	Allowable Method(s) of Compliance
Fab	Acid Exhaust	Thin films / diffusion, diffusion non-deposition, plasma etch, wet etch / wet clean, and ion implant process tools and associated equipment	Inorganic HAP	Inorganic HAP emissions ≤ 0.42 ppmv or reduced by 95%
Fab	CVD Exhaust	Thin films / diffusion process tools and associated equipment	Inorganic HAP	Inorganic HAP emissions ≤ 0.42 ppmv or reduced by 95%
Fab	Ammonia Exhaust	Chemical mechanical polishing tools and associated equipment Potential for trace inorganic HAP due to potential intermingling with fab acid and CVD exhausts	Inorganic HAP Organic HAP	Inorganic HAP emissions ≤ 0.42 ppmv or reduced by 95% Organic HAP emissions ≤ 20 ppmv or reduced by 98%
Fab	Solvent Exhaust	Photolithography process tools and associated equipment	Organic HAP	Organic HAP emissions ≤ 20 ppmv or reduced by 98%
Fab	General Exhaust	Methanol or other organic HAP used for cleaning	Organic HAP	Organic HAP emissions ≤ 20 ppmv or reduced by 98%
HPM	Acid Exhaust	Tanks storing acidic raw materials that are HAP	Storage Tank	Inorganic HAP emissions ≤ 0.42 ppmv or reduced by 95%
HPM	Ammonia Exhaust	Trace inorganic HAP due to potential intermingling with CUB/HPM acid exhaust	Storage Tank	Inorganic HAP emissions ≤ 0.42 ppmv or reduced by 95%
HPM	Solvent Exhaust	Trace inorganic HAP due to potential intermingling with HPM acid exhaust	Storage Tank	Inorganic HAP emissions ≤ 0.42 ppmv or reduced by 95%
WWT	Acid Exhaust	Tanks storing acidic waste materials that are HAP	Storage Tank	Inorganic HAP emissions ≤ 0.42 ppmv or reduced by 95%
WWT	Ammonia Exhaust	Trace inorganic HAP due to potential intermingling with WWT acid exhaust	Storage Tank	Inorganic HAP emissions ≤ 0.42 ppmv or reduced by 95%
WWT	Solvent Exhaust	Trace inorganic HAP due to potential intermingling with WWT acid exhaust	Storage Tank	Inorganic HAP emissions ≤ 0.42 ppmv or reduced by 95%

1.1.2 Stack Testing to Demonstrate Compliance with BACT/LAER Limits

As outlined in Permit Application 1, the proposed air permit project will be subject to BACT for particulate matter (PM), carbon monoxide (CO), and greenhouse gases (GHGs), and subject to LAER for oxides of

nitrogen (NO_x) and volatile organic compounds (VOC). As such, Micron has proposed limits in Permit Application 2 on both emission rates and potential annual emissions for each of these pollutants.

To demonstrate that the estimated emission rates and potential to emit (PTE) are conservative in cases where engineering judgement and semiconductor process knowledge were used in the absence of published emission factors, Micron proposes stack testing for pollutants subject to BACT or LAER. At this time, no tests are proposed for GHGs, as emissions of GHGs from fab process operations are calculated using emission factors published by the Intergovernmental Panel on Climate Change (IPCC). As described below, emissions of other pollutants from fab process operations are estimated using methods that are more difficult to verify.

For each test for pollutants subject to BACT or LAER, Micron proposes a testing frequency of once every five (5) years. To address the fact that each exhaust includes several stacks in parallel pulling from one common header, resulting in potential variations in exhaust composition between stacks on the same header, Micron proposes to test individual stacks located in positions on the header that would be expected to see the highest concentrations of pollutants. A representative subset of stacks to test will be determined as part of each stack test protocol submitted to the NYSDEC. **Note that testing may be substituted for a vendor guarantee for control, where applicable.**

1.1.2.1 Proposed NO_x Testing

Emissions of NO_x from combustion sources were estimated using published emission factors in the United States Environmental Protection Agency (USEPA)'s AP-42 guidance. NO_x will also be emitted as a result of semiconductor process operations through the oxidation of nitrogen-bearing compounds such as nitrous oxide (N₂O) and ammonia (NH₃). These compounds will be used primarily in processes exhausting to the fab CVD exhaust, as well as some processes exhausting to the fab acid exhaust. Based on semiconductor process knowledge, emissions were estimated using conservative assumptions regarding the stoichiometric conversion of these compounds to NO_x.

Micron proposes testing for NO_x from the fab acid, CVD, and solvent exhausts. This test would be completed at the inlet to the fab acid scrubbers, CVD scrubbers, and RCTOs. The emission rate measured would be compared to the expected emission rate estimated using the PTE calculations.

1.1.2.2 Proposed PM Testing

Emissions of PM from combustion sources and cooling towers were estimated using published emission factors, including those from AP-42. PM will also be emitted as a result of semiconductor process operations through the oxidation of process raw materials into solid compounds, predominantly silicon dioxide (SiO₂). SiO₂ and other particulate will be emitted through the fab CVD and solvent exhausts. Based on semiconductor process knowledge, emissions were estimated using conservative assumptions regarding the stoichiometric conversion of process raw materials to their oxides.

Micron proposes testing for total PM from the fab acid, CVD, and solvent exhausts. This test would be completed at the inlet to the fab acid scrubbers, CVD scrubbers, and RCTOs. The emission rate measured would be compared to the expected emission rate estimated using the PTE calculations.

1.1.2.3 Proposed VOC Testing

Emissions of VOC from combustion sources and storage tanks were estimated using published emission factors, including those from AP-42. Micron will use VOC solvents in the photolithography and wet etch/wet clean processes, which will exhaust to the fab solvent exhaust. VOC solvents will also be used to clean tools,

workstations, floors, etc. Emissions of these cleaning solvents will be exhausted through all of the exhaust systems as part of the fab operations. Based on semiconductor process knowledge, emissions were estimated using conservative assumptions regarding the extent to which these solvents will evaporate during use.

VOC will also be used and/or generated in other processes that exhaust to the fab acid, ammonia, and CVD exhausts, but the majority of total VOC emissions from the fab building will exhaust to the fab solvent exhaust.

Micron proposes testing for total VOC from the fab acid, CVD, and solvent exhausts. This test would be completed at the inlet to the fab acid scrubbers, CVD scrubbers, and RCTOs. The emission rate measured would be compared to the expected emission rate estimated using the PTE calculations. **Note that Micron has proposed both percent reduction and outlet concentration compliance options for certain operations. As such, inlet and outlet testing may not be needed to demonstrate compliance with all emission limits.**

1.1.2.4 Proposed CO Testing

Emissions of CO from combustion sources were estimated using published emission factors from AP-42. CO will also be generated as a result of semiconductor process operations through the partial oxidation of organic compounds primarily in thermal oxidation systems and rotor-concentrator thermal oxidizers (RCTOs). Additional CO emissions from these sources have been estimated by multiplying the emissions predicted by AP-42 by a factor of 5, to reflect the fact that natural gas combustion alone accounts for just a portion of CO generated. Thermal oxidation systems all exhaust to the fab acid exhaust and fab CVD exhaust, and RCTOs all exhaust to the fab solvent exhaust.

Therefore, Micron proposes testing for CO from the fab acid CVD, and solvent exhausts. This test would be completed at the inlet to the fab acid scrubbers, CVD scrubbers, and RCTOs. The emission rate measured would be compared to the expected emission rate estimated using the PTE calculations.

1.1.3 Stack Testing to Confirm Engineering Estimates

The PTE calculations for semiconductor processes were largely based on semiconductor process knowledge and incorporated conservative engineering estimates. Micron recognizes that NYSDEC has an interest in confirming the accuracy of these calculations, as described in NOIA Comment #18, NOIA Comment #24, and TR Comment #12. Therefore, Micron is proposing stack testing for a subset of toxic air contaminants that represents each of several categories of emission factors used in the PTE calculations.

Stack testing for a subset of contaminants is proposed above in lieu of testing for each and every individual compound since it will accomplish the goal of confirming Micron's engineering estimates in a much more efficient manner. It is not feasible to detect every air contaminant potentially emitted from semiconductor process due to small usage quantities of many raw materials and the high levels of dilution achieved by the fab exhausts. Therefore, many compounds will be below detection using sound testing methodologies. In addition, Micron has no regulatory requirement to test any pollutants other than HAP regulated by NESHAP Subpart BBBBB. Other semiconductor fabs in New York have testing requirements that are limited to criteria pollutants and HAP.

For each pollutant to be tested to confirm engineering estimates, Micron proposes two (2) initial performance tests, one at the time each half of Fab 1 becomes fully operational. For pollutants where performance test results show emission rates less than those calculated in Permit Application 2, Micron proposes no additional testing. To address the fact that each exhaust includes several stacks in parallel

pulling from one common header, resulting in potential variations in exhaust composition between stacks on the same header as identified in NOIA Comment #15 and TR Comment #5, Micron proposes to test individual stacks that are located in positions on the header that would be expected to see the highest concentrations of pollutants. A conservative subset of stacks to test will be determined as part of each stack test protocol submitted to the NYSDEC.

1.1.3.1 Proposed Testing to Confirm Absence of CVD Reactants

CVD processes utilize several reactants whose purpose is to decompose and deposit an atom or group of atoms onto a wafer. After this reaction occurs in a process chamber, these reactants will flow through process equipment exhaust conditioner (PEEC) burners, which are expected to oxidize the unreacted portion into a number of byproducts. The composition of the exhaust from these processes was estimated through stoichiometric equations in Appendix G to Permit Application 1.

To confirm the absence of reactants that are predicted to fully decompose into byproducts in the exhaust, Micron proposes to test the outlet of PEECs routed to the CVD exhaust for one (1) CVD reactant, to be determined at the time of the stack test protocol submittal, to the extent that an established, reliable test method exists to identify that chemical.

1.1.3.2 Proposed Testing to Confirm Presence of CVD Byproducts

As described above and as mentioned by NYSDEC in NOIA Comment #24 and TR Comment #12, CVD processes generate chemical byproducts that are unique from raw materials used. These byproducts are generated through both chemical reactions in process chambers and oxidation of process exhaust in PEEC burners. The composition of the exhaust from these processes was estimated through stoichiometric equations in Appendix G to Permit Application 1.

To confirm the presence and predicted emission rates of byproducts from CVD processes, Micron proposes to test the test the outlet of PEECs routed to the CVD exhaust for each byproduct predicted as a result of using the CVD reactant chosen for the test described above, so long as established test methods exist to identify those chemicals.

1.1.3.3 Proposed Testing to Confirm Emission Factor of 0.50

Emissions of aqueous ammonia are estimated using a process emission factor of 0.50 pounds emitted per pound used. Aqueous ammonia used will be exhausted through the ammonia exhaust. Micron proposes to validate this emission factor by testing the inlet for the ammonia scrubbers.

1.1.3.4 Proposed Testing to Confirm Emission Factor of 0.20

Emissions of many volatile solvents were estimated using a process emission factor of 0.20 pounds emitted per pound used. Micron proposes to validate this estimated emission factor by selecting one (1) compound with emissions estimated using this factor and testing for it in the appropriate exhaust(s). The compound will be determined at the time of the stack test protocol submittal.

1.1.3.5 Proposed Testing to Confirm Emission Factor of 0.05

Emissions of many aqueous acidic and basic solutions and solvents with relatively low volatility were estimated using a process emission factor of 0.05 pounds emitted per pound used. Micron proposes to validate this estimated emission factor by selecting one (1) compound with emissions estimated using this factor and testing for it in the appropriate exhaust(s). The compound will be determined at the time of the stack test protocol submittal.

1.1.3.6 Compounds With an Estimated Emission Factor of 0.001

Emissions of many compounds that are expected to exist in the process exhaust only in trace amounts were estimated using a process emission factor of 0.001 pounds emitted per pound used. Micron asserts that the emission factor of 0.001 is conservative for these compounds, and that stack testing is not necessary. These compounds are not expected to be detected in the exhaust ductwork or at the stack.