SUPPLEMENTAL BEST AVAILABLE CONTROL TECHNOLOGY (BACT) ANALYSIS

September 15, 2026

As defined by Maine DEP, Best Available Control Technology (BACT) means an emission limitation based on the maximum degree of reduction which is achievable for each pollutant taking into account energy, environmental, and economic impacts and other costs.

On August 13, 2026, Maine DEP requested:

- A BACT analysis addressing emissions of perfluoroalkyl and polyfluoroalkyl substances (PFAS) to supplement the existing minor source air emission license application; and
- A BACT analysis addressing emissions of carbon monoxide (CO) and volatile organic compounds (VOC) from the facility

This supplemental BACT analysis addresses the requests from Maine DEP. Because PFAS is a subset of VOC, the more general VOC BACT analysis is presented first, followed by the BACT analysis addressing PFAS specifically.

Table 1 BACT Technology Selection

Pollutant	BACT Selection
CO	High-Temperature Thermal Oxidation
VOC	High-Temperature Thermal Oxidation
PFAS	High-Temperature Thermal Oxidation

1 Introduction

The steps to prepare a BACT analysis are specified in Maine DEP's guidance document, "A Summary of EPA and Maine DEP BAQ Instructions for Conducting a BACT Analysis"[1]. The analysis included a review of EPA's RACT/BACT/LAER Clearinghouse (RBLC) database and other available industry references, e.g. State-issued air permits, where applicable. The RBLC database was queried for projects within the past ten years, and no relevant comparable projects were identified. The relevant projects described here are identified based on Project team knowledge, industry references, and literature. No relevant federal, state, or local air pollution control requirements were identified.

As stated within the above-referenced guidance document, "Best Available Control Technology (BACT)" refers to "a*n emission limitation […] based on the maximum degree of reduction which is achievable for each pollutant taking into account energy, environmental, and economic impacts and other costs.*"

[1] https://www.maine.gov/dep/air/publications/docs/BACTGuidanceA-L-0082.pdf

Top-down BACT consists of the following five-step process (as further detailed within the guidance document):

1. Identify all control technologies.
2. Eliminate technically infeasible options.
3. Rank remaining control technologies by control effectiveness.
4. Evaluate the most effective controls and document results.
5. Select BACT.

Once BACT is selected, the applicant should also propose BACT license requirements.

BACT analysis guidelines include the following (paraphrased):

- The applicant must evaluate the entire range of demonstrated options, including alternatives that may be transferable or innovative.

- The level of detail in the control options analysis should vary with the relative magnitude of emissions reduction achievable. In selecting one of the alternatives in technology, the applicant should consider application of flue gas treatment, fuel treatment and processes, and/or other techniques which are inherently low polluting and are economically feasible. In cases where technological or economic limitations on the application of measurement techniques would make the imposition of an emission limitation infeasible, a design, operating, equipment, or work practice standard may be proposed by the source.

- Emission limits should be expressed in pounds/hour (based on maximum capacity) and in terms of process unit variables, such as quantity of material processed, fuel consumed, or pollutant concentrations (e.g., lb/MMBtu, lb/gal of solids applied, g/dscm).

- Emission limits and work practice standards must be enforceable. License conditions should specify appropriate stack testing, continuous emission monitoring, continuous process monitors, recordkeeping, etc. by which to demonstrate compliance.

It should be noted that Aries Pine Tree LLC uses a proprietary and innovative biosolids gasification process with heat recovery; the only directly comparable process is at the Aries facility in Linden, NJ. As summarized in the following sections, the selection of the thermal oxidizer represents the "Top-Case" of this Top-Down BACT analysis, i.e., no other viable control technology options are available; the BACT process is therefore abridged accordingly.

2 Process and Control Technology Overview

As described in Section 2 of the air permit application, Aries Pine Tree LLC's proposed biosolids gasification facility will accept dewatered biosolids from regionally located municipal wastewater treatment facilities. After being dried, the biosolids are gasified in an oxygen-starved environment without combustion flame using a proprietary fluidized bed process, which reduces the biosolids to a useful biochar (collected by truck for off-site use or disposal) and a producer gas. The producer gas is primarily composed of nitrogen (N2), hydrogen (H2), CO, methane (CH4), and carbon dioxide (CO2), with trace amounts of other hydrocarbons, tars, particulate matter, and PFAS (found in the biosolids at trace concentrations).

The producer gas is combusted on-site using a thermal oxidizer, which destroys pollutants and produces useful heat that is recycled within the facility. The Aries Pine Tree LLC project will use a direct fired thermal oxidizer, depicted in Figure 1.

The thermal oxidizer is a refractory lined steel cylinder, which receives producer gas from the Gasifier mixed with the exhaust from the dryer and vessel vents in the plant. In addition to producer gas, the thermal oxidizer can operate on natural gas and can co-fire both gases. The thermal oxidizer operation allows proper mixing of the gases and sufficient residence time and temperature to destroy volatile organic compounds (VOCs), CO, PFAS, and other pollutants.

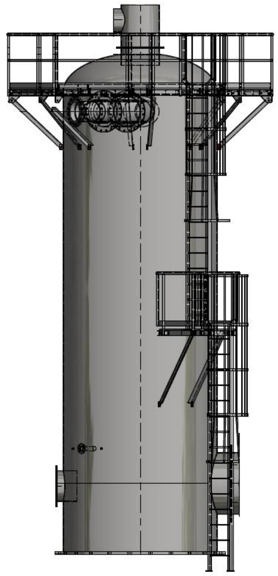
The heat from the oxidized gases is used in the heat recovery exchangers to heat oil for the dryers while also cooling the exhaust gas prior to it entering the emissions control unit. The flue gases are all contained and exhausted to the stack assisted by an induced draft fan.

Combustion air is added to the thermal oxidizer with a fan. An oxygen sensor is used to ensure that sufficient air is being added in the thermal oxidizer to facilitate control to complete combustion. Temperature sensors are mounted at the end of the thermal oxidizer to control temperature between 1800^{o}F and 2200° F, however the setpoint will be set to 2200° F during initial operation until stack testing is completed to determine the optimum temperature that will reliably achieve the emission limits (while saving energy and minimizing nitrogen oxides (NOx) emissions) in the Air License.

The heat recovery system uses the thermal oxidizer flue gas in a heat exchanger to raise the temperature of heat transfer fluid in a closed loop for the dryers and for the Organic Rankine Cycle (ORC) power generator. This heat exchanger also reduces the temperature of the flue gas to ensure proper operation of the air emissions control system (downstream of the thermal oxidizer) consisting of selective catalytic reduction (controlling NOx), dry sorbent injection (controlling SO_2, H_2SO4, HCl and HF), and a ceramic filter (controlling PM).

As summarized in the following sections, the selection of this thermal oxidizer represents the “Top-Case” of this Top-Down BACT analysis, i.e., no other control technology is available; any additional method such as adding an oxidation catalyst to the ceramic filter has not been demonstrated.   The proposed thermal oxidizer system will oxidize 99.9% of the CO and 99.5% of the VOC, will operate at a much higher temperature than oxidizers at typical biosolids incinerators (1800-2200 F vs 1400 F), and will not have any internal heat recovery system which tend to leak inlet gas to the outlet, thus degrading destruction efficiency.

Figure 1 Aries Thermal Oxidizer



3 Carbon Monoxide (CO)

The facility's CO emissions of significance are generated from the above-described biosolids gasification process which exhausts through the facility's main stack. As further detailed in the project's previously-submitted emission calculations (*Attachment F* of the minor source air license application submitted on 1/28/2026): Aries Pine Tree LLC proposes to limit CO emissions to 4.10 lb/hr at the main stack. The facility will meet this limit using the gasification unit's intrinsic thermal oxidizer which provides ≥ 99.9% CO reduction.

There are no alternative control strategies which would afford greater control. Specifically:

- Increasing the proposed oxidizer operating temperature or residence time is unlikely to significantly improve CO reduction. Thermal oxidation is an established technology, and with experience across several different applications. Based on that industry-wide experience incremental increases to temperature or residence time would have diminishing returns, and would have the detrimental effect of increasing NOx emissions.

- Adding an oxidation catalyst downstream of the oxidizer would not be technically feasible. Such a catalyst would need to be integrated with the ceramic filter system. While such systems are demonstrated in practice for Selective Catalytic Reduction for NOx control (and are proposed for this project) they are not demonstrated for oxidation catalysts. If placed upstream of the other control devices (ceramic filter and dry scrubber) such a catalyst would be subject to poisoning (permanent deactivation) from contaminants present in the exhaust stream. If placed downstream of the other control devices the catalyst would no longer be at the needed temperature to perform effectively. In addition, the oxidation catalyst would oxidize SO_2 to H_2SO_4 downstream of the ceramic PM filter and sorbent, which would then react with ammonia slip from

SCR (NOx control) to form ammonium sulfate salts which would add PM. This PM would increase the PM emissions and could lead to visible emissions from the stack or even outside the stack from sublimation in the ambient air as the temperature drops.

As stated above, Aries Pine Tree LLC uses a proprietary and innovative biosolids gasification process with heat recovery. There are no directly comparable facilities that have undergone construction, commissioning, and emissions demonstration testing. To date, the only potentially comparable process has been the Aries facility in Linden, NJ, which represents a "prior generation" version of the Aries Pine Tree project. The specific engineering design for the Aries Pine Tree LLC site will incorporate improvements based on experience from the Linden project, including air emission rates based on field observations and updated technical calculations. Other improvements will include a better dryer design, improved material handling, hot oil heating instead of air heating, etc.

The Linden project achieved a CO emission rate of 4.83 lb/hr during stack testing, or approximately 1.4 pounds of CO per dry ton of biosolids. The proposed emission limit of 4.10 lb/hr CO for Aries Pine Tree LLC equates to 0.98 pounds of CO per ton of dry solids at full load. This reflects the higher proposed operating temperature of the proposed thermal oxidizer, and overall design improvements.

Other recently-permitted sewage sludge processing facilities were also reviewed, however, those were not analogous to Aries Pine Tree (e.g., using incineration technologies rather than gasification) and/or they represent experimental facilities that have not yet been constructed and field-tested, rather than a mature field-tested technology. The specific facilities that were identified are as follows:

- Upper Blackstone Clean Water in Millbury, Massachusetts. Per MassDEP Air Plan Approval #CE-18-006 (7/31/2018), this facility utilizes two Sewage Sludge Incinerators (SSIs) with thermal oxidizers. Each thermal oxidizer achieves compliance with a limit of 98% CO reduction, which is less efficient than proposed for the Project, and has a higher CO emission limit than proposed for Aries Pine Tree on a pounds per dry ton basis (2.85 vs. 0.98); this is also enforced as a long-term limit (60 TPY CO for both units combined).

- Delcora in Chester, Pennsylvania. Per PADEP Title V Permit #23-00038 (12/30/2025), Section G, this facility utilizes two Sewage Sludge Incinerators (SSIs) with thermal oxidizers. The facility has a higher CO emission limit than proposed for Aries Pine Tree on a pounds per dry ton basis (5.91 vs. 0.98).

- Warren Wastewater Treatment Plant (WWTP) in Warren, Michigan. Per MI EGLE Air Permit #112-24 (10/22/2024), this facility utilizes two Biocon ERS Furnaces with wet scrubbers. No CO mass emission rate limits or CO control devices are listed; furthermore, a review of Michigan's "MiEnviro" data portal did not indicate that this facility has yet undergone construction / commissioning and demonstrated compliance testing.

- Indiantown Upcycling Facility in Indiantown, Florida. Per FLDEP Air Permit #0850168-002-AC (11/4/2025), this facility utilizes one Varcor Boiler with biofilter. No CO mass emission rate limits or CO control devices are listed; furthermore, media reports indicate that the facility is still under construction (i.e., field testing has not been demonstrated).

- Edmonds Wastewater Treatment Plant (WWTP) in Edmonds, Washington. Per Puget Sound Air Registration #14063 (publicly available draft dated 5/31/2022), the facility utilizes a gasifier with thermal oxidizer (using non-Aries technology) that can be used in either a biochar production or mineral production scenario. Although the facility is permitted for a lower CO emission rate than Aries Pine Tree on a pounds per dry ton basis [0.59 vs. 0.98], media reports indicate that this facility has experienced significant challenges in terms of its construction and commissioning process. This facility is therefore not being considered a successful test case for purposes of this BACT analysis, as its emission limits are not demonstrated in practice.

Therefore, based on operational experience and best engineering judgment and an emission rate of 4.10 lb/hr (equivalent to 0.98 pounds of CO per dry ton of material processed at full load) is deemed as both conservative and technically achievable at Aries Pine Tree LLC, and will represent BACT for the project. This reflects a CO removal efficiency of 99.9%, but the removal efficiency is not proposed as an enforceable limit (as documenting the CO emissions before control would be challenging). Compliance is proposed using EPA standard stack testing methods (biennial testing), with a work practice standard of maintaining a minimum oxidizer temperature of 1800ºF (monitored continuously with compliance based on a 1-hour block average). For PFAS, the oxidizer is proposed to be operated at 2200 F until and unless stack testing for PFAS demonstrates that a lower temperature would achieve the necessary PFAS destruction.

4 Volatile Organic Compounds (VOC)

The facility's VOC emissions of significance are generated from the above-described biosolids gasification process which exhausts through the facility's main stack. As further detailed in the project's previously-submitted emission calculations (*Attachment F* of the minor source air permit application submitted on 1/28/2026): Aries Pine Tree LLC proposes to limit VOC emissions to 2.14 lb/hr at the main stack. The facility will meet this limit using the gasification unit's intrinsic thermal oxidizer which provides ≥99.5% VOC reduction.

As discussed above, there are no alternative control strategies which would afford greater control. Increasing the oxidizer temperature or residence time would have diminishing returns and would have energy and environmental impacts (NOx formation). An oxidation catalyst would provide marginal if any additional control of VOC, and is technically infeasible as discussed above.

As stated above, Aries Pine Tree LLC uses a proprietary and innovative biosolids gasification process with heat recovery. There are no directly comparable facilities that have undergone construction, commissioning, and emissions demonstration testing. To date, the only potentially comparable process has been the Aries facility in Linden, NJ, which represents a "prior-generation" version of the Aries Pine

Tree project. The specific engineering design for the Aries Pine Tree LLC site will incorporate improvements based on experience with the Linden project, including air emission rates based on updated designs and field observations. Other improvements will include a better dryer design, improved material handling, hot oil heating instead of air heating, etc.

The Linden project had a VOC emission limit of 1.31 lb/hr, based on 99.5% VOC destruction and assumed "producer gas" VOC rate of ≤ 262 lb/hr at the oxidizer inlet. However, subsequent operational experience has shown that, depending on the characteristics of the biosolids, the producer gas can have a higher VOC rate. The proposed VOC emission limit for Aries Pine Tree LLC reflects that potential for a higher incoming VOC emission rate while maintaining the 99.5% VOC removal rate.

Other recently-permitted sewage sludge processing facilities were also reviewed, however, those were not analogous to Aries Pine Tree (e.g., using incineration technologies rather than gasification) and/or they represent experimental facilities that have not yet been constructed and field-tested, rather than a mature field-tested technology. The specific facilities that were identified are as follows:

- Upper Blackstone Clean Water in Millbury, Massachusetts. Per MassDEP Air Plan Approval #CE-18-006 (7/31/2018), this facility utilizes two Sewage Sludge Incinerators (SSIs) with thermal oxidizers. The facility has a marginally lower VOC emission limit than proposed for Aries Pine Tree on a pounds per dry ton basis [0.48 vs. 0.51]; but this is enforced as a long-term limit (10 TPY VOC for both units combined). On a short-term basis, the facility achieves compliance with a 99% VOC reduction, which is less efficient than proposed for the Project.

- Delcora in Chester, Pennsylvania. Per PADEP Title V Permit #23-00038 (12/30/2025), Section G, this facility utilizes two Sewage Sludge Incinerators (SSIs) with thermal oxidizers. The facility has a lower VOC emission limit than proposed for Aries Pine Tree on a pounds per dry ton basis [0.23 vs. 0.51], but this is enforced as a long-term VOC limit to facilitate air permitting (the Permit states: "*A VOC limit of 4.0 tons/year enabling the facility to meet minor source status for RACT was included*"), and no short-term VOC emission limits apply for comparison to the Project.

- Warren Wastewater Treatment Plant (WWTP) in Warren, Michigan. Per MI EGLE Air Permit #112-24 (10/22/2024), this facility utilizes two Biocon ERS Furnaces with wet scrubbers. The facility has a marginally higher VOC emission limit than proposed for Aries Pine Tree on a pounds per dry ton basis [0.55 vs. 0.51]. Furthermore, a review of Michigan's "MiEnviro" data portal did not indicate that this facility has yet undergone construction / commissioning and demonstrated compliance testing.

- Indiantown Upcycling Facility in Indiantown, Florida. Per FLDEP Air Permit #0850168-002-AC (11/4/2025), this facility utilizes one Varcor Boiler with biofilter. No VOC mass emission rate limits other than a 90% VOC reduction standard (significantly less efficient than Aries Pine Tree) are listed; furthermore, media reports indicate that the facility is still under construction (i.e., field testing has not been demonstrated).

- Edmonds Wastewater Treatment Plant (WWTP) in Edmonds, Washington. Per Puget Sound Air Registration #14063 (publicly available draft dated 5/31/2022), the facility utilizes a gasifier with thermal oxidizer (using non-Aries technology) that can be used in either a biochar production or mineral production scenario. Although the facility is permitted for a significantly lower VOC emission rate than Aries Pine Tree on a pounds per dry ton basis [0.02 vs. 0.51], media reports indicate that this facility has experienced significant challenges in terms of its construction and commissioning process. This facility is therefore not being considered a successful test case for purposes of this BACT analysis.

At the only facility with a permitted VOC emission rate significantly lower than Aries Pine Tree, the commissioning process has been reported as not meeting expectations, including multiple technical failures and a consistent failure to achieve steady operations. These facilities are therefore not deemed appropriate for use in the current BACT analysis.

Therefore, based on operational experience and best engineering judgment, an emission rate of 2.14 lb/hr (equivalent to 0.51 pounds of VOC per dry ton of material processed at full load) is deemed as both conservative and technically achievable at Aries Pine Tree LLC, and will represent BACT for the project. This reflects a removal efficiency of a VOC removal efficiency of 99.5%, but the removal efficiency is not proposed as an enforceable limit (as documenting the VOC emissions before control would be challenging). Compliance is proposed using EPA standard stack testing methods (biennial testing), with a work practice standard of maintaining a minimum oxidizer temperature of 1800°F (monitored continuously with compliance based on a 1-hour block average). For PFAS, the oxidizer is proposed to be operated at 2200 F until and unless stack testing for PFAS demonstrates that a lower temperature would achieve the necessary PFAS destruction.

5 Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS)

As-described in the project's previously-submitted application, the high temperature in the thermal oxidizer serves to oxidize VOC, including PFAS. Because PFAS are a subset of VOC, the control technology review presented for VOC is applicable to PFAS.

However, high-temperature oxidation is particularly important for PFAS destruction. Breaking all carbon–fluorine bonds in a PFAS molecule (i.e., complete destruction) requires substantial energy and high temperatures due to the strength of the carbon-fluorine bond. Experiments conducted by EPA researchers using a pilot-scale combustor found that temperatures above ~2,000°F resulted in high PFAS destruction efficiencies and few detectable fluorinated Products of Incomplete Combustion (PICs)[2].

The entire range of options is evaluated. No other control technology will remove PFAS as effectively. Air pollution control techniques such as wet scrubbing, dry scrubbing, adsorption, and condensation will all be less effective and would generally simply move the PFAS from one media to another without destroying it. The use of high-temperature oxidation is a technology transferred from other PFAS destruction projects (such as the destruction of firefighting foam). There are no technically feasible opportunities to remove PFAS from the biosolids before gasification, and the gasification itself serves to destroy much of the PFAS. Increasing oxidizer temperature or residence time would have diminishing returns and have energy and environmental impacts (e.g., NOx formation). Use of an oxidation catalyst is technically infeasible and would not prove effective PFAS control.

No similar projects were identified with PFAS air emission limits achieved in practice. PFAS control from biosolids combustion does not have an extensive history of being regulated by State agencies. However, the air permit for the above-referenced Warren WWTP in Warren, MI (not directly comparable to Aries Pine Tree) does confirm that high-temperature oxidation (1994°F) is appropriate for PFAS control, and the permit approves 90% PFAS destruction efficiency.

Technological limitations on the application of measurement methodology would make the imposition of an emission standard for PFAS (as defined in the Maine statute) infeasible, as follows:

- PFAS is defined at *38 MRSA §*1614 1.F as "substances that include any member of the class of fluorinated organic chemicals containing at least one fully fluorinated carbon atom";
- Aries is not using or adding any PFAS chemicals to the process – on the contrary, the proposed Project is intended to allow for the safe destruction of biosolids known to contain small quantities of different PFAS chemicals.
- Available stack test methods will quantify emissions of certain specific PFAS chemicals but will not quantify the amount of any chemical that meets the Maine definition of PFAS.
    - EPA's Other Test Method-45 (OTM-45) measures the concentration of a targeted list of 49 polar, semi-volatile PFAS in exhaust gas. EPA's OTM-50 measures exhaust concentrations of 30 non-polar, volatile fluorinated compounds (VFCs). The use of both methods would not necessarily capture all "fluorinated organic chemicals containing at least one fully fluorinated carbon atom."
    - Total fluorine analysis is not readily applicable to air testing. Semi-volatile PFAS air testing involves transferring the PFAS to another media (solid sorbents and liquid condensate) for

[2] Environmental Protection Agency. 2026. Interim Guidance on the Destruction and Disposal of Perfluoroalkyl and Polyfluoroalkyl Substances and Materials Containing Perfluoroalkyl and Polyfluoroalkyl Substances— 2026 Version. https://www.epa.gov/system/files/documents/2026-04/2026-interim-guidance-on-pfas-destruction-and-disposal.pdf

LC/MS analysis designed to measure a finite list of target compounds. Similarly, volatile VFC air testing involves collection of whole air samples in a canister for GC/MS analysis designed to measure a finite list of target compounds. Unlike other media (solids and liquids) it is not possible to collect the entire range of organic fluorine compounds in one sample or by any one method. It is Epsilon's understanding that EPA has abandoned their efforts to publish a method for total fluorine analysis in air media. In any event, a total fluorine analysis would capture compounds that do not meet the definition of PFAS.

Consistent with Maine DEP BACT Guidance, while technological economic limitations on the application of measurement methodology would make the imposition of a total PFAS emission standard infeasible, a combination of design, equipment, work practices, and operational standards can be used to document BACT. In this case, the addition of surrogate emissions testing can also serve to document BACT. Aries Pine Tree LLC proposes the following:

- Maintenance of the oxidizer temperature at 2,200 F or higher until such time as testing documents compliance with the other permit conditions at a lower temperature (not lower than 1800 F). Document compliance continuously during operation based on a 1-hour block average.
- Documenting <1% of incoming PFAS exists as air emissions, per testing as-follows:
    - Total mass PFAS compounds in the incoming biosolids, tested using EPA Method 1633 or 1633A.
    - Total mass of PFAS compounds detected in the exhaust using Method OTM-45, plus total mass of PFAS compounds detected in the exhaust using Method OTM-50.
- Testing two key PFAS constituents:
    - Perfluorooctanoic acid (PFOA) emissions no greater than 5.3 x 10-6 pound/hour, which reflects 1% of the incoming PFOA calculated based on the facility's rated capacity, and an incoming biosolids concentration of 63 parts per billion dry weight, tested biennially using OTM-45.
    - Perfluorooctane sulfonate (PFOS) emissions no greater than 1.0 x 10-5 pound/hour which reflects 1% of the incoming PFOA calculated based on the facility's rated capacity, and an incoming biosolids concentration of 120 parts per billion dry weight, tested biennially using OTM-45.
- Monitoring the incoming biosolids. Per *38 MRSA §1310-N, Sub §10-D,* Maine facilities will be required to characterize biosolids including analysis for PFAS. Aries Pine Tree LLC will use those analyses, plus similar analyses for any out-of-state sources, and will track incoming material to document:
    - PFOA incoming concentration no greater than 63 ppb dry weight, based on a weighted average of the incoming material on a twelve-month rolling average calculated monthly.
    - PFOS incoming concentration no greater than 120 ppb dry weight, based on a weighted average of the incoming material on a twelve-month rolling average calculated monthly.

The maximum PFOA and PFOS concentrations are selected based on the peak reported concentrations 2019-2022 as described in Table 1-2 of *An Evaluation of Biosolids Management in Maine and Recommendations for the Future,* Brown & Caldwell, December 2023. All testing methods are subject to update with Maine DEP's approval as updated testing methods become available.

6 BACT Summary and License Requirements

Per the sections above, the BACT process and control technology selection for PFAS, CO, and VOC at Aries Pine Tree, LLC is summarized as follows:

Table 2 BACT Summary

BACT Step	PFAS	CO	VOC
1. Identify all control technologies.	Intrinsic Thermal Oxidizer only	Intrinsic Thermal Oxidizer only	Intrinsic Thermal Oxidizer only
2. Eliminate technically infeasible options.	N/A – no alternatives demonstrated	N/A – no alternatives demonstrated	N/A – no alternatives demonstrated
3. Rank remaining control technologies by control effectiveness.	N/A – no alternatives demonstrated	N/A – no alternatives demonstrated	N/A – no alternatives demonstrated
4. Evaluate the most effective controls and document results.	Intrinsic Thermal Oxidizer, <1% emissions to air based on mass balance, lb/hr limits for PFOA and PFOS	Intrinsic Thermal Oxidizer, 4.10 lb/hr emission rate	Intrinsic Thermal Oxidizer, 2.14 lb/hr emission rate
5. Select BACT.	Intrinsic Thermal Oxidizer, <1% emissions to air based on mass balance, lb/hr limits for PFOA and PFOS	Intrinsic Thermal Oxidizer, 4.10 lb/hr emission rate	Intrinsic Thermal Oxidizer, 2.14 lb/hr emission rate

The proposed compliance conditions (license requirements) are presented below, and are consistent with those presented for other applicable pollutants and parameters listed in the 1/28/2026 Minor Source Air License application (Section 5). The listed EPA test methods are as expected; alternate test methods may be proposed within stack test protocols in accordance with best industry standards.

Table 3 **BACT Summary**

Pollutant	BACT Limit	Proposed License Requirement
CO	4.10 lb/hr	Conduct biennial stack tests using EPA Test Method 10, maintain minimum and continuously record oxidizer temperature
VOC	2.14 lb/hr	Conduct biennial stack tests using EPA Test Methods 18/25A, maintain minimum and continuously record oxidizer temperature
PFAS	Operational standards PFOA limit of 5.3 x 10-6 lb/hr, PFOS limit of 1.0 x 10-5 lb/hr	Initial test of destruction efficiency using inlet biosolids testing & OTM-45 and OTM-50 stack testing, biennial test for PFOA and PFOS using EPA Test Methods OTM-45, testing of incoming biosolids PFOA and PFOS, maintain minimum and continuously record oxidizer temperature