NORTH CAROLINA DIVISION OF AIR QUALITY

Application Review

Issue Date: XXXX XX, 2022

Region: Washington Regional Office
County: Bertie
NC Facility ID: 0800044
Inspector's Name: Betsy Huddleston
Date of Last Inspection: 09/18/2020
Compliance Code: 3 / Compliance - inspection

Facility Data

Applicant (Facility's Name): Avoca LLC

Facility Address:
Avoca LLC
841 Avoca Farm Road
Merry Hill, NC 27957

SIC: 2087 / Flavoring Extracts And Syrups,nec
NAICS: 31193 / Flavoring Syrup and Concentrate Manufacturing

Facility Classification: Before: Title V **After:** Title V
Fee Classification: Before: Title V **After:** Title V

Permit Applicability (this application only)

SIP: 15A NCAC 02D .0503, .0504, .0515, .0516, .0521, .0614, and .1806
NSPS: 15A NCAC 02D .0524 – Subpart Dc
NESHAP: 15A NCAC 02D .1111 – Subpart FFFF, ZZZZ, and DDDDD
PSD: 15A NCAC 02D .0530
PSD Avoidance: N/A
NC Toxics: 15A NCAC 02D .1100
112(r): N/A
Other: N/A

Contact Data

Facility Contact	Authorized Contact	Technical Contact
Brian Conner EH&S Manager (252) 482-2133 PO Box 129 Merry Hill, NC 27957	Augustinus Gerritsen Vice President (252) 482-2133 PO Box 129 Merry Hill, NC 27957	Brian Conner EH&S Manager (252) 482-2133 PO Box 129 Merry Hill, NC 27957

Application Data

Application Number: 0800044.21A
Date Received: 06/30/2021
Application Type: Renewal
Application Schedule: TV-Renewal

Existing Permit Data
Existing Permit Number: 01819/T53
Existing Permit Issue Date: 08/06/2019
Existing Permit Expiration Date: 12/31/2021

Total Actual emissions in TONS/YEAR:

CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2019	2.67	31.81	1403.40	23.73	0.3540	303.38	264.35 [Methanol (methyl alcohol)]
2018	2.57	30.93	1280.53	20.88	0.5840	368.93	299.66 [Methanol (methyl alcohol)]
2017	3.20	34.63	1268.61	25.45	0.5040	353.95	298.22 [Methanol (methyl alcohol)]
2016	2.67	30.68	1221.52	21.50	0.5050	338.82	269.99 [Methanol (methyl alcohol)]
2015	3.10	33.91	939.80	24.70	0.5350	263.87	207.17 [Methanol (methyl alcohol)]

Review Engineer: David B. Hughes

Review Engineer's Signature: **Date: XXXX XX, 2022**

Comments / Recommendations:
Issue 01819/T54
Permit Issue Date: XXXX XX, 2022
Permit Expiration Date: XXXX XX, 2027

I. Purpose of Applications

Application No. 0800044.21A

This permitting action is a renewal of an existing Title V permit pursuant to 02Q .0513. The existing Title V permit (**01819T53**) was issued on **August 6, 2019**, with an expiration date of **December 31, 2021**. The renewal application **0800044.21A** was received on **June 30, 2021**, or at least six months prior to the original expiration date **December 31, 2021**. Therefore, the existing permit shall not expire until the renewal permit has been issued or denied. All terms and conditions of the existing permit shall remain in effect until the renewal permit has been issued or denied.

II. Facility Description

Avoca owns and operates a facility located at 841 Avoca Farm Road, Merry Hill, North Carolina. The Avoca facility extracts oils and nutrients from various types of plants for use in flavorings, fragrances, food additives, and dietary supplements. The main product of the facility is sclareol which is extracted from sage grown on farms in counties surrounding the Avoca Plant.

The process operations at the facility include rotocel, recovery, sclareol re-crystallization (SFG), sclareolide (SDE-1 and 2), plant nutrient extraction (PNE), ethyl vanillin glucoside (EVG), botanical extraction, and biomass extraction. Miscellaneous operations include; two No. 2 fuel oil-fired boilers (ID Nos. H-101 and H-102, 20.3 million Btu per hour heat input each), one propane-fired boiler (ID No. H-104, 33.5 million Btu per hour), two biomass boilers (ID Nos. ES-BB1 and ES-BB2), 24 million Btu per hour heat input each), four No. 2 fuel oil-fired emergency generators (ID Nos. E101, E102, E104 and E105), one No. 2 fuel oil-fired fire water pump (ID No. FP), one wastewater treatment plant aeration tank (ID No. WWTP-AT1), and one flaker deconditioner (ID No. ES-DEC-2001).

Avoca has requested the following updates to the current permit.

1. Permit Condition 2.1 A – The permit conditions include 15A NCAC 02D .1109 for Case-by-Case MACT for the boilers. This requirement expired in May 19, 2019 with the replacement of the federal MACT 40 CFR 63, Subpart DDDDD and thus Avoca requests to remove this condition from the table and permit.
2. Permit Condition 2.1 E – The permit conditions for the two biomass boilers ES-BB1 and ES-BB2 currently indicate that they are subject to 15A NCAC 02D .0503. When the boilers were initially installed, they were permitted to fire sage (a plant material) and wood. The firing of sage was not successful, and thus the boilers are now fired with 100% wood. A such, 15A NCAC 02D .0504 is applicable to the biomass boilers instead of 02D .0503. Avoca requests to update in the current permit
3. The current permit does not denote that the Biomass Extraction Operations are subject to 40 CFR Part 63 Subpart FFFF in the Table in Section 1. Permit Condition 2.1 D does list biomass extraction as subject to Subpart FFFF as well as in Permit Condition 2.2.C. Avoca request adding 40 Part 65 Subpart FFFF applicability to the Table in Section 1.

The Division of Air Quality (DAQ) has reviewed and accepted these requests. The updates have been implemented into the new Title V Air Permit No. **01819T54**.

III. History/Background/Application Chronology

January 12, 2017 – Permit No. **01819T47** issued as a Title V renewal.

July 27, 2017 – Permit No. **01819T48** issued as an administrative amendment. Ownership change from Avoca, Inc. to Ashland, LLC. No change to the facility name has been requested, therefore, remains Avoca, Inc.

April 26, 2019 – Betsy Huddleston of the Winston-Salem Regional Office (WaRO) completed the annual compliance inspection of the facility.

August 17, 2017 – Permit No. **01819T49** issued as a Minor Modification Permit. For the modification, updated emission sources (existing and new equipment) and added Primary and Secondary Operating Scenarios to emission sources in Section 2.1 B.1 and 2.1 D.

April 17, 2018 – Permit No. **01819T50** issued as an administrative amendment. Changed facility name from Avoca, Inc. to Avoca LLC.

September 4, 2018 - Permit No. **01819T51** issued as a Minor Modification Permit. For the modification, added a new Flaker Deconditioner (ID No. ES-DEC-2001) controlled by a simple cyclone (ID No. CD-MHZ-2001).

April 22, 2019 – Permit No. **01819T52** issued as a Minor Modification Permit. For the modification, replaced existing No. 2 fuel oil-fired boiler (ID No. H-103) with a new propane-fired boiler (ID No. H-104). Also includes an alternative operating scenario for monitoring of the chilled water condenser (ID No. CD-4002) and mineral oil scrubber (ID No. CD-4003-S) installed on the new sclareolide operations (ID No. SDE-2).

August 6, 2019 – Permit No. **01819T53** issued as a Minor Modification Permit. For the modification, removed an existing No. 2 fuel oil-fired rotary dryer (ID No. ES-RD) and simple cyclone (ID No. CD-BB1C).

June 30, 2021 – DAQ received Permit Application **4100772.21A**, as a Title V renewal. The application was deemed complete for processing.

March 4, 2022 - DRAFT permit sent to Permittee, Supervisor, WSRO and Samir Parekh for comment. Brian Conner (Avoca LLC) provided comments on draft permit and review via e-mail on **April 4, 2022**. Samir Parekh provided comments pertaining to CAM via email on **March 14, 2022**. Betsy Huddleston (WaRO) provided comments on the air permit review on **March 29, 2022**.

July 26, 2022 – Sent updated DRAFT permit to Dale Overcash for review. Incorporated the latest permit language from Joe Voelker. The new language is for emission sources – Two No. 2 fuel oil-fired boilers (ID Nos. H-101 and H-102) (2.1 A.5 - MACT 40 CFR 63, Subpart DDDDD), One Propane-fired boiler (ID No. H-104) (2.1 A.4 - NSPS 40 CFR 60, Subpart Dc and 2.1 A.6 - MACT 40 CFR 63, Subpart DDDDD), One diesel-fired emergency generator (ID No. E105) and one associated catalytic oxidizer (ID No. CD-CatOx1) (2.1 B.3 – MACT 40 CFR 63, Subpart ZZZZ), and Two biomass boilers (ID Nos. ES-BB1 and ES-BB2) controlled by bagfilter (ID No. CD-BB1BH) (2.1 E.4 – NSPS 40 CFR 60, Subpart Dc and 2.1 E.5 – MACT 40 CFR 63, Subpart DDDDD).

August 3, 2022 – Dale Overcash sent his comments via email regarding the two No. 2 fuel oil-fired boilers (ID Nos. H-101, H-102, and H-104) and two biomass boilers (ID Nos. ES-BB1 and ES-BB2).

August 12, 2022 – Teams meeting with Dale Overcash, David B. Hughes, and Joseph Voelker to discuss language for Air Permit No. 01819T54 regarding Ultra Low Sulfur Liquid (USLD) for two No. 2 fuel oil-fired boilers (ID Nos. H-101 & H-102), one propane-fired boiler (ID No. H-104) and two biomass boilers (ID Nos. ES-BB1 & ES-BB2).

September 9, 2022 – David B. Hughes sent Dale Overcash the most recent draft with language regarding USLD for two No. 2 fuel oil-fired boilers (ID Nos. H-101, H-102), one propane-fired boiler (ID No. H-104), and two biomass boilers (ID No. ES-BB1 and ES-BB2) for his review before sending to Public Notice and EPA review.

September 27, 2022 – Dale Overcash sent David B. Hughes a email confirming that the Air Permit No. 01819T54 was acceptable to send to Public Notice and EPA Review.

October XX, 2022 - Draft permit and review sent to 30-day public comment and 45-day EPA review periods.

XXXX XX, 2022 – Jenny Sheppard (DAQ) updated TVEE.

XXXX XX, 2022 - 30-day public comment period ended; no comments received.

XXXX XX, 2022 – 45-day EPA Review period ended; no comments received.

XXXX XX, 2022 – Jenny Sheppard (DAQ) updated TVEE.

XXXX XX, 2022 – Air Permit No. **01819T54** issued as a Title V permit.

IV. Permit Modifications/Changes and TVEE Discussion

The following table provides a summary of the changes to the permit.

Page No.	Section	Description of Changes
Global	Global	-Updated the application number and complete date. -Updated permit revision number to T54. -Updated the issuance/effective dates to permit.
Cover Letter	Cover Letter	-Updated PSD increment tracking statement.
3	List of Acronyms	-Moved List of Acronyms from end of permit.
4 - 9	Section 1 Equipment Table	-Removed 15A NCAC 02D .1109 112(j); Case-by-Case MACT designations. -Removed footnotes 3 and 4 due to the fact the dates are past due for Case-by-Case MACT and MACT DDDDD. -Removed footnotes 5, 6, and 7. The minor modifications are being subjected to public and EPA review with this renewal process; therefore, receiving the permit shield. -Added MACT FFFF applicability to emission sources (ID Nos. MHZ-1002, ES-1004-1, ES-1004-2-F, ES-1004-2-WW, ES-1004-2Silo, and ES-MSDU-1024). -Changed One No. 2 fuel oil-fired emergency generator ID No. from ES-PkGen1 to E105.

Page No.	Section	Description of Changes
		-Moved Three No. 2 oil-fired emergency generators (ID Nos. E101, E102, and E103) and One No. 2 fuel oil-fired emergency fire water pump (ID No. FP) to Insignificant Activities list.
10	2.1 A Table	-Removed 15A NCAC 02D .1109 112(j); Case-by-Case MACT.
---	2.1 A.4	-Removed 15A NCAC 02D .1109 112(j); Case-by-Case MACT.
11	2.1 A.4	-Updated 40 CFR Part 60 Subpart Dc shell language for one propane-fired boiler (ID No. H-104).
11 - 15	2.1 A.5	-Updated 40 CFR Part 63, Subpart DDDDD shell language for two No. 2 fuel oil-fired boilers (ID Nos. H-101 and H-102).
15 - 17	2.1 A.6	-Updated 40 CFR Part 63, Subpart DDDDD shell language for one propane-fired boiler (ID No. H-104).
18	2.1 B	-Changed One No. 2 fuel oil-fired emergency generator ID No. from ES-PkGen1 to E105.
18	2.1 B Table	-Removed 15A NCAC 02Q .0317 to avoid 15A NCAC 02D .0530.
18	2.1 B.1.a & c 2.1 B.2.a & c 2.1 B.3.a	-Changed One No. 2 fuel oil-fired emergency generator ID No. from ES-PkGen1 to E105.
18	2.1 B.3	-Updated 40 CFR Part 63 Subpart ZZZZ language for one diesel-fired emergency generator (ID No. E105).
---	2.1 B.4	-Removed 15A NCAC 02Q .0317: AVOIDANCE CONDTIONS to avoid 15A NCAC 02D .0530: PREVENTION OF SIGNIFICANT DETERIORATION.
25	2.1 E Table	-Replaced 15A NCAC 02D .0503 with 15A NCAC 02D .0504.
25 & 26	2.1 E.1	-Replaced 15A NCAC 02D .0503 language with 15A NCAC 02D .0504 language.
27	2.1 E.4	-Updated 40 CFR Part 60 Subpart Dc shell language for two biomass boilers (ID Nos. ES-BB1 & ES-BB2).
27 -32	2.1 E.5	-Updated 40 CFR Part 63, Subpart DDDDD shell language for two biomass boilers (ID Nos. ES-BB1 & ES-BB2).
---	2.1 F	-Removed Three Emergency Generators and Fire Water Pump (ID Nos. E101, E102, E104, & FP) from permit and added them to the Insignificant Activities list.
37	2.1 I.1.c.ii	-Removed annual internal inspection for cyclone (ID No. CD-MHZ-2001). DAQ doesn't require annual internal inspections for cyclones that aren't equipped with a door.
62 & 63	Section 3 Insignificant Activities	-Moved Insignificant Activities list and removed footnote 3. -Moved Three No. 2 oil-fired emergency generators (ID Nos. E101, E102, and E103) and One No. 2 fuel oil-fired emergency fire water pump (ID No. FP) to Insignificant Activities list to permit.
64 - 72	Section 4	-Updated shell conditions (v6.0, 01/07/2022).

Page No.	Section	Description of Changes
	General Conditions	

There were significant modifications to the equipment descriptions needed in Title V Equipment Editor (TVEE).

V. Regulatory Review

The facility is currently subject to the following regulations:

15A NCAC 02D .0503, "Particulates from Fuel Burning Indirect Heat Exchangers"
15A NCAC 02D .0504, "Particulates from Wood Burning Indirect Heat Exchangers"
15A NCAC 02D .0515, "Particulates from Miscellaneous Industrial Processes"
15A NCAC 02D .0516, "Sulfur Dioxide Emissions from Combustion Sources"
15A NCAC 02D .0521, "Control of Visible Emissions"
15A NCAC 02D .0524, New Source Performance Standards (40 CFR 60, Subparts Dc)
15A NCAC 02D .0530, "Prevention of Significant Deterioration"
15A NCAC 02D .0614, "Compliance Assurance Monitoring"
15A NCAC 02D .1100, Control of Toxic Air Pollutants *(State-Enforceable Only)*
15A NCAC 02D .1111, "Maximum Achievable Control Technology (40 CFR 63, Subparts FFFF, ZZZZ, and DDDDD)"
15A NCAC 02D .1806, "Control and Prohibition of Odorous Emissions" *(State-Enforceable Only)*

A. Two No. 2 Fuel Oil-fired Boilers (ID Nos. H-101 and H-102) and One Propane-fired Boiler (ID No. H-104)

1. 15A NCAC 02D .0503 – Particulates from Fuel Burning Indirect Heat Exchangers

   Emissions of particulate matter (PM) from the combustion of No. 2 fuel oil that are discharged from the sources into the atmosphere from boilers (ID Nos. H-101 and H-102) shall not exceed 0.37 pounds per million Btu (lb/MMBtu) input. Emissions of PM from the combustion of propane that are discharged from the sources in to the atmosphere from boiler (ID No. H-104) shall not exceed 0.33 lb/MMBtu heat input. The AP-42 emission factor for particulate emitted from No. 2 fuel oil combustion is 0.014 lb/MMBtu (at 140,000 Btu/gal). Propane particulate emissions are considered negligible (NC LPG combustion spreadsheet cites 0.00053 lb/MMBtu). There are no monitoring/recordkeeping/reporting conditions for the boilers under this rule in the permit. Continued compliance is expected.

2. 15A NCAC 02D .0516 – Sulfur Dioxide Emissions from Combustion Sources

   The sulfur dioxide (SO_2) emitted by the boilers shall not exceed 2.3 lb/MMBtu heat input. The AP-42 factor for No. 2 fuel oil sulfur dioxide emission is 0.5 lb/MMBtu (sulfur content is less than 0.5% and heat content is assumed approximately 140,000 Btu/gal). There are no monitoring/recordkeeping/reporting conditions for the boilers under this rule in the permit. Continued compliance is expected.

3. 15A NCAC 02D .0521 – Control of Visible Emissions

   Boilers H-101 and H-102 are limited to an opacity of 40%. Boiler H-103 is limited to 20% opacity. The limits may not be exceeded more than once in any hour and not more than four times in any 24-

hour period. There are no permit monitoring/recordkeeping/reporting requirements for the boilers under this rule. Continued compliance is expected.

4. 15A NCAC 02D .0524 – New Source Performance Standards (40 CFR Part 60, Subpart Dc – Standards of Performance for New Stationary Sources

   See Section VI. for discussion.

5. 15A NCAC 02D .1111 – Maximum Achievable Control Technology (40 CFR Part 63, Subpart DDDDD – National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters

   See Section VI. for more details.

B. Emergency Engines/Generators (ID Nos. E101, E102, E104, & FP) and E105)

1. 15A NCAC 02D .0516 – Sulfur Dioxide Emissions from Combustion Sources

   The sulfur dioxide emitted by the generators shall not exceed 2.3 lb/MMBtu heat input. The SO_2 AP-42 emission factor from large engines (>500 hp) is 0.5 lb/MMBtu. These engines fire ultra-low sulfur diesel. There are no monitoring/recordkeeping/reporting conditions under this rule in the permit for the engines. Continued compliance is expected.

2. 15A NCAC 02D .0521 – Control of Visible Emissions

   The engines are all limited to an opacity of 20%. The limits may not be exceeded more than once in any hour and not more than four times in any 24-hour period. There are no monitoring/recordkeeping/reporting requirements for the engines under this rule. Continued compliance is expected.

3. 15A NCAC 02D .1111 – Maximum Achievable Control Technology (40 CFR Part 63, Subpart ZZZZ – National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

   See Section VI. for more details.

4. 15A NCAC 02Q .0317: Avoidance Conditions to avoid 15A NCAC 02D .0530: Prevention of Significant Deterioration

   Emergency generator (ID No. E105) is currently subject to this regulation. However, Joseph Voelker of Raleigh Central Office Permitting Section of DAQ ran the Potential to Emit (PTE) calculations at 500 hour per year for an emergency engine (consistent with EPA and DAQ policy for permitting) and using the DAQ spreadsheet, the PTE for all PSD pollutants are well under the PSD significance theresholds. As such no PSD avoidance is necessary for this emergency engine. The regulation has been removed from the permit.

C. Rotocel Operations, including:

- Rotocel extractor, desolventizer, and solvent separation/recovery (ID No. ES-1001-2-1-P) and one associated chilled water condenser (ID No. CD-31209) venting to one packed tower scrubber (ID No. CD-1001-2-S-1);

- Two storage and recycle tanks (ID No. ES-M-125A and M-125B) and one associated chilled water condenser (ID No. CD-1001-2-C-1) venting to one packed tower scrubber (ID No. CD-1001-2-S-1);
- Process equipment leaks (ID No. ES-1001-2-1-F); and
- Rotocel Operations wastewater stream (ID No. ES-1001-2-1-WW)

Recovery Operations, including:

- Arcon process tank M-1 (ID No. ES-1001-1-1-P1) and one associated chilled water condenser (ID No. CD-1001-1-3) venting to one packed tower scrubber (ID No. CD-1001-2-S-1);
- One chilled water condenser (ID No. CD-1001-1-T5B) venting to packed tower scrubber (ID No. CD-1001-2-S-1) controlling emissions from:
  Stripper T-5 and receiver M-21 (ID No. ES-1001-1-1-P2); and
  Seven fixed roof process tanks of various capacities and one fixed roof methanol storage tank (ID No. ES-1001-1-1-P3);
- Process equipment leaks (ID No. ES-1001-1-1-F); and
- Recovery Operations wastewater stream (ID No. ES-1001-1-1-WW)

1. 15A NCAC 02D .0530 – Prevention of Significant Deterioration

   See Section VI. for more details.

2. 15A NCAC 02D .0614 – Compliance Assurance Monitoring

   See Section VI. for more details.

3. 15A NCAC 02D .1100 – Control of Toxic Air Pollutants *(State-Enforceable Only)*

   See Section VII. for more details.

4. 15A NCAC 02Q .1111 – Maximum Achievable Control Technology (40 CFR Part 63, Subpart FFFF – National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing

   See Section VI. for more details.

5. 15A NCAC 02D .1806 – Control and Prohibition of Odorous Emissions *(State-enforceable only)*

   The facility is subject to this regulation because it has the potential to be a source of odorous emissions. It requires the facility to utilize management practices or odor control equipment sufficient to prevent odorous emissions from causing or contributing to objectionable emissions beyond the facility boundaries.

D. Botanical Extraction Operations, including:

- Immersion extractor Z-1001, desolventizer Z-1002, day tank 90024, first-stage evaporator EX-1012, second stage evaporator EX-1013, distillation column EX-90008 and nine process tanks of various capacities (ID No. ES-1001-11-1-P) and one associated chilled water condenser (ID No. CD-1001-11-EX1002) venting to one cryogenic (nitrogen) condenser system (ID No. CD-1001-11-EX1003);
- Plant Material Grinder (ID No. MHZ-1002) and one associated bagfilter (ID No.CD-1003-4-1);

- Process equipment leaks (ID No. ES-1001-11-1-F); and
- Botanical extraction operations wastewater stream (ID No. ES-1001-11-WW)

Biomass Extraction Operations, including:

- Biomass extraction debagging (ID No. ES-1004-1) and one associated cartridge filter (ID No. CD-1004-1-FF1);
  Primary Operating Scenario (POS)
- Immersion extractor Z-41001, desolventizer Z-41002, day tank 490025, iso-hexane storage tank 490024, first-stage evaporator EX-41012, second stage evaporator EX-41013, distillation column EX-490008 and nine process tanks of various capacities (ID No. ES-1004-2-P) and one associated chilled water condenser (ID No. CD-1004-2EX1002) venting to one cryogenic (nitrogen) condenser system (ID No. CD-1004-2EX1003);
  Secondary Operating Scenario (SOS)
- Immersion extractor Z-41001, day tank 490025, storage tank 490024, first-stage evaporator EX-4102, second stage evaporator EX-41013, distillation column EX-490008, nine process tanks of various capacities (ID No. ES-1004-2-P); tray dryer (RV-1002) equipped with a bagfilter (DC-1001) vented to a condenser (HX-1001) and a solvent knockout pot (TK-1002); all vented to one associated chilled water condenser (ID No. CD-1004-2EX1002) venting to one cryogenic (nitrogen) condenser system (ID No. CD-1004-2EX1003);
- Process equipment leaks (ID No. ES-1004-2-F);
- Wastewater tanks and other similar vessels (ID No. ES-1004-2-WW);
- Biomass extraction operations wastewater stream (ID No. ES-1003-10-WW);
- Biomass silo loadout (ID No. ES-1004-2Silo) and one associated bagfilter (ID No. CD-1004-2-FF2); and
- Molecular sieve (ID No. ES-MSDU-1024)

1. 15A NCAC 02D .0515 – Particulates from Miscellaneous Industrial Processes

Emissions of particulate matter (PM) from the plant material grinder (ID No. MHZ-1002), the biomass extraction debagging operation (ID No. ES-1004-1), tray dryer (ID No. RV-1002), and the biomass silo loadout (ID No. ES-1004-2-Silo) shall not exceed an allowable emission rate.

(a) The allowable emission rates for particulate matter from any stack, vent, or outlet, resulting from any industrial process for which no other emission control standards are applicable, shall not exceed the level calculated with the equation $E = 4.10(P)^{0.67}$ *calculated to three significant figures for process rates less than or equal to 30 tons per hour. For process rates greater than 30 tons per hour, the allowable emission rates for particulate matter shall not exceed the level calculated with the equation* $E = 55.0(P)^{0.11} - 40$ *calculated to three significant figures. For the purpose of these equations "E" equals the maximum allowable emission rate for particulate matter in pounds per hour and "P" equals the process rate in tons per hour.*

To demonstrate compliance, Avoca is required to perform inspections and maintenance as recommended by the manufacturer. At a minimum the bagfilters and system ductwork must be externally inspected monthly and internally inspected annually. Continued compliance is expected.

2. 15A NCAC 02D .0521 – Control of Visible Emissions

This permit condition applies to the Biomass debagger and silo. Each is limited to an opacity of 20% under this rule. The limits may not be exceeded more than once in any hour and not more than four times in any 24-hour period. To ensure compliance, Avoca is required to observe visible emissions

from the debagger and silo baghouses on a semi-annual basis. Avoca is required to submit a semi-annual summary report for VE observations of the operations. Continued compliance is expected.

3. 15A NCAC 02D .0530 – Prevention of Significant Deterioration

   See Section VI. for more details.

4. 15A NCAC 02D .0614 – Compliance Assurance Monitoring

   See Section VI. for more details.

5. 15A NCAC 02D .1100 – Control of Toxic Air Pollutants *(State-Enforceable Only)*

   See Section VII. for more details.

6. 15A NCAC 02Q .1111 – Maximum Achievable Control Technology (40 CFR Part 63, Subpart FFFF – National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing

   See Section VI. for more details.

7. 15A NCAC 02D .1806 – Control and Prohibition of Odorous Emissions *(State-enforceable only)*

   The facility is subject to this regulation because it has the potential to be a source of odorous emissions. It requires the facility to utilize management practices or odor control equipment sufficient to prevent odorous emissions from causing or contributing to objectionable emissions beyond the facility boundaries.

E. Two Biomass Boilers (ID Nos. ES-BB1 and ES-BB2) controlled by a bagfilter (ID No. CD-BB1BH)

1. Avoca has requested replacing regulation 15A NCAC 02D .0503 with 15A NCAC 02D .0504. When the boilers were initially installed, they were permitted to fire sage (a plant material) and wood. The firing of sage was not successful, and thus the boilers are now fired with 100% wood. The regulatory review of 15A NCAC 02D .0504 is presented below. No other regulatory review is required at this time.

   15A NCAC 02D .0504: Particulates from Wood Burning Indirect Heat Exchangers

   This rule applies to emission sources that burn 100% wood. The following equation is used to calculate the allowable emissions of PM:

   $E = 1.1698 \times Q^{-0.2230}$

   Where E is the allowable emission limit for particulate matter in pounds per million Btu (lb/MMBtu) and Q is the maximum heat input million Btu per hour (MMBtu/hr). The heat input for each boiler is 24 MMBtu/hr each. The allowable emission limit for each boiler is 0.58 lb/MMBtu.

Using AP-42 emission factors, PM emissions from wood residue combustion are estimated to be less than 0.0114 lb/MMBtu. The emission factors for fabric filters for wood residue combustion is 0.1 lb/MMBtu. The boilers are expected to comply with this standard for wood firing.

2. 15A NCAC 02D .0516 – Sulfur Dioxide Emissions from Combustion Sources

   The sulfur dioxide (SO_2) emitted by the boilers shall not exceed 2.3 lb/MMBtu heat input. The boilers combust only wood chip. Sage is no longer burned. The SO_2 AP-42 emission factor for wood combustion is 0.025 lb/MMBtu. There are no monitoring/recordkeeping/reporting conditions for the boilers under this rule in the permit. Continued compliance is expected.

3. 15A NCAC 02D .0521 – Control of Visible Emissions

   Boilers ES-BB1 and ES-BB2 are limited to an opacity of 20%. The limits may not be exceeded more than once in any hour and not more than four times in any 24-hour period. Avoca is required to observe boiler opacity once a day. "Normal" is any VE below 20%. Continued compliance is expected.

4. 15A NCAC 02D .0524 – New Source Performance Standards (40 CFR Part 60, % Dc – Standards of Performance for New Stationary Sources

   See Section VI. for more details.

5. 15A NCAC 02D .1111 – Maximum Achievable Control Technology (40 CFR Part 63, Subpart DDDDD – National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters

   See Section VI. for more details.

F. Sclareol Recrystallization (SFG) Operations, including:

- **One process tank (ID No. T-3001)***
- **Four process tanks (ID Nos. T-3002 through 3005)***
- **One storage tank (ID No. T-3006)***
- **One process tank (ID No. T-3007)***
- **Two centrifuges (ID Nos. C-3001 and C-3002)***
- **One reactor (ID No. R-3001) equipped with two process chilled water condensers (EX-3001 and EX-3002) with control chilled water condenser (ID No. CD-3001)***
- **One reactor (ID No. R-3002)* equipped with a process chilled water condenser (EX-3003)**
- **One reactor (ID No. R-3003)* equipped with a process chilled water condenser (EX-3004)**
- **One reactor (ID No. R-3004)* equipped with a process chilled water condenser (EX-3005)**
- **One steam heated dryer (ID No. D-3001) equipped with a process chilled water condenser (EX-3002) with control chilled water condenser (ID No. CD-3001)***
- **One steam heated dryer (ID No. D-3002) equipped with a process chilled water condenser (EX-3006) with control chilled water condenser (ID No. CD-3002)***
- **Process equipment leaks (ID No. ES-1003-10-F)**
- **SFG Operations wastewater stream (ID No. ES-1003-10-WW)**

* These emission sources may be controlled with a chilled water condenser **(ID No. CD-3003)** in series with a mineral oil scrubber **(ID No. CD-3004-S)**. These control devices are optional

controls. The Permittee has the option to construct or not construct these devices and has the option to operate or not operate these devices.

1. 15A NCAC 02D .0530 – Prevention of Significant Deterioration

Avoca submitted a PSD application for the SFG expansion (T45 issued). SFG is limited to no more than 217.4 tons VOC emitted per consecutive 12-month period.

Monitoring/Recording

- VOC emissions must be calculated and recorded at the end of each month. VOC emissions must be calculated by multiplying the total amount of each VOC-containing material consumed during the month by the VOC content of the material.

Reporting

- Avoca must submit semi-annual reports containing the following data:
  i. the monthly VOC emissions for each of the previous 17 months; and
  ii. the yearly VOC emissions for each consecutive 12-month period ending on each month of the previous six-month period.

2. 15A NCAC 02D .1100 – Control of Toxic Air Pollutants *(State-Enforceable Only)*

See Section VII. for more details.

3. 15A NCAC 02D .1806 – Control and Prohibition of Odorous Emissions *(State-enforceable only)*

The facility is subject to this regulation because it has the potential to be a source of odorous emissions. It requires the facility to utilize management practices or odor control equipment sufficient to prevent odorous emissions from causing or contributing to objectionable emissions beyond the facility boundaries.

G. Sclareolide (SDE-1) Operations, including:

- **Eleven (11) process tanks of various capacities (ID No. ES-1001-1-3-P, Tank ID Nos. M-2, M-4, M-4A, M-39, M-44, M-15, M-17, M-17A, M-16, M-11, and TK-1210);**
- **One centrifuge (ID No. G-17);**
- **One steam-heated dryer with process condenser (ID No. D-1202);**
- **Filters (ID No. ES-1001-1-3-Filters);**
- **SDE-1 process equipment leaks (ID No. ES-1001-3-F); and**
- **SDE-1 wastewater stream (ID No. ES-1001-1-3-WW)**

1. 15A NCAC 02Q .1111 – Maximum Achievable Control Technology (40 CFR Part 63, Subpart FFFF – National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing

See Section VI. for more details.

2. 15A NCAC 02D .1806 – Control and Prohibition of Odorous Emissions *(State-enforceable only)*

The facility is subject to this regulation because it has the potential to be a source of odorous emissions. It requires the facility to utilize management practices or odor control equipment

sufficient to prevent odorous emissions from causing or contributing to objectionable emissions beyond the facility boundaries.

H. Sclareolide (SDE-2) Operations, including:

- **One chilled water condenser (ID No. CD-4002) in series with a mineral oil scrubber (ID No. CD-4003-S) controlling emissions from the following:**
  - **One 17,900 gallon virgin solvent tank (ID No. T-4001);**
  - **Two 6,000 gallon process tanks (ID Nos. T-4017 and T-4018);**
  - **One 4,200 gallon reactor with process condenser (EX-4001) (ID No. R-4004);**
  - **One 4,200 gallon reactor with process condenser (EX-4002) (ID No. R-4005);**
  - **One 4,200 gallon reactor with process condenser (EX-4003) (ID No. R-4044);**
  - **One 1,500 gallon reactor (ID No. R-4015); and**
  - **One centrifuge (ID No. C-4001)**
- **One dryer with process condenser (EX-4004) with associated chilled water condenser (ID No. CD-4001) in series with a chilled water condenser (ID No. CD-4002) and mineral oil scrubber (ID No. CD-4003-S)**
- **SDE-2 process equipment leaks (ID No. ES-4000-F); and**
- **SDE-2 wastewater stream (ID No. ES-4000-WW)**

1. 15A NCAC 02D .0530 – Prevention of Significant Deterioration

   Avoca submitted a PSD application for the SDE-2 expansion (T46 issued). SDE-2 is limited to no more than 354.4 tons of VOC emitted per consecutive 12-month period.

   Monitoring/Recordkeeping

   - VOC emissions must be calculated and recorded at the end of each month. VOC emissions must be calculated by multiplying the total amount of each VOC-containing material consumed during the month by the VOC content of the material.

   Reporting

   - Avoca must submit semi-annual reports containing the following data:
     i. the monthly VOC emissions for each of the previous 17 months; and
     ii. the yearly VOC emissions for each consecutive 12-month period ending on each month of the previous six-month period.

2. 15A NCAC 02Q .1111 – Maximum Achievable Control Technology (40 CFR Part 63, Subpart FFFF – National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing

   See Section VI. for more details.

3. 15A NCAC 02D .1806 – Control and Prohibition of Odorous Emissions *(State-enforceable only)*

   The facility is subject to this regulation because it has the potential to be a source of odorous emissions. It requires the facility to utilize management practices or odor control equipment sufficient to prevent odorous emissions from causing or contributing to objectionable emissions beyond the facility boundaries.

I. One Flaker Deconditioner (ID No. ES-DEC-2001)

1. 15A NCAC 02D .0515 – Particulates from Miscellaneous Industrial Processes

   Emissions of particulate matter (PM) from the flaker deconditioner (ID No. ES-DEC-2001) shall not exceed an allowable emission rate.

   (a) The allowable emission rates for particulate matter from any stack, vent, or outlet, resulting from any industrial process for which no other emission control standards are applicable, shall not exceed the level calculated with the equation $E = 4.10(P)^{0.67}$ *calculated to three significant figures for process rates less than or equal to 30 tons per hour. For process rates greater than 30 tons per hour, the allowable emission rates for particulate matter shall not exceed the level calculated with the equation* $E = 55.0(P)^{0.11} - 40$ *calculated to three significant figures. For the purpose of these equations "E" equals the maximum allowable emission rate for particulate matter in pounds per hour and "P" equals the process rate in tons per hour.*

   The deconditioner emissions are controlled by a cyclone (ID No. CD-MHZ-2001). The permit condition requires monthly visual external inspection of the cyclone. Condition 2.1 I.1.c.ii was removed. DAQ doesn't require annual inspections of simple cyclones that aren't equipped with a door. The results of the monthly visual external inspection must be recorded in a logbook. Submittal of a semi-annual summary report of the inspection activities is required. Continued compliance is expected.

2. 15A NCAC 02D .0521 – Control of Visible Emissions

   This permit condition applies to the deconditioner. The deconditioner is limited to an opacity of 20% under this rule. The limits may not be exceeded more than once in any hour and not more than four times in any 24-hour period. To ensure compliance, Avoca is required to observe the deconditioner opacity once per month and record observations in a logbook. Semi-annual summary reports are required. Continued compliance is expected.

VI. NSPS, NESHAPS/MACT, PSD, 112(r), CAM

NSPS

The Permittee is currently subject to New Source Performance Standards (NSPS), 40 CFR 60, Subpart Dc "Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units."

40 CFR Part 60, Subpart Dc – Standards of Performance for Small Industrial Commercial Institutional Steam Generating Units

40 CFR Part 60, Dc is applicable to units that began construction, modification, or reconstruction after June 9, 1989, and has a maximum design heat input capacity between 10 and 100 MMBtu/hr. The two biomass boilers **(ID Nos. ES-BB1 and ES-BB2)** have a heat input capacity of 24 MMBtu/hr each. The boilers utilize wood material as the primary fuel currently. The boilers are considered affected facilities under Subpart Dc since the units were constructed on or after June 9, 1989 (began operation October 2011). Boiler **(ID No. H-104)** was installed in 2019 with a rated capacity of 33.475 MMBtu/hr thus is also considered an affected facility subject to Subpart Dc. Boiler H-104 utilizes propane as the primary fuel.

Avoca acknowledges the following:

1. There are no SO_2 standards for wood boilers or propane boilers
2. Boilers ES-BB1 and ES-BB2: There are no PM or opacity standards for wood boilers with a heat input less than 30 MMBtu/hr.
3. Boiler H-104 has a heat input rating greater than 30 MMBtu/hr, but there are no PM or opacity standards subject to the boiler as it will only fire a gaseous (propane) fuel.

As such, Avoca boilers are not subject to any PM, opacity or SO_2 requirements listed in Subpart Dc for any of the subject boilers.

Record keeping and reporting requirements outlined in 60.48c will also apply to these boilers. Specifically, 60.48c(a) sets forth the initial reporting requirements of 60.7(a)(1&3). Written notification is required for the following:

- Notification of the date construction is commenced. This must be postmarked no later than 30 days after such date.
  - This notification was submitted on May 26, 2011, for ES-BB1 and ES-BB2. Avoca, Inc. began construction of the two biomass boilers on May 2, 2011.
  - Boiler H-104 was received as a "mass-produced unit which was purchased and was delivered in completed form" as outlined in 40 CFR Part 60.7(a)(1). Based on this provision, it was interpreted that no notification of construction is required for boiler H-104.
- Notification of the actual date of initial start-up postmarked within 15 days of the actual date.
  - This notification was submitted in October 2011 (October 14 for Boiler ES-BB1 and October 31 for Boiler ES-BB2). Boiler ES-BB1 commenced operation on October 10, 2011, and Boiler ES-BB2 commenced operation on October 24, 2011.
  - This notification was submitted in January 2019 for Boiler H-104. Boiler H-104 commenced operation on or about January 15, 2019.

60.48c(a)(1) stipulates the inclusion of the design heat input of the boilers along with the types of fuels to be combusted. 60.48c(2-4) are not applicable to any of these boilers. 60.48c(g) requires and allows the affected facility to record and maintain the amounts of each fuel used during each calendar month. This permit renewal does not affect this status.

NESHAPS/MACT

National Emissions Standards for Hazardous Air Pollutants (NESHAP) are applicable to major sources of HAP. A HAP major source is defined as having potential emissions in 10 tpy or more for any individual HAP and/or potential emissions of 25 tpy or more for total HAP. The following NESHAPs are applicable to emission sources at the Avoca facility.

40 CFR Part 63, Subpart FFFF – Miscellaneous Organic Chemical Manufacturing NESHAP (the "MON")

Facility-wide: Heat Exchange Systems

Avoca utilizes a cooling tower system to cool various processes at the Merry Hill facility. The heat exchange system is subject to heat exchange systems monitoring per 40 CFR 63.2490 (Subpart FFFF) and 40 CFR 63.104 (Subpart G), by reference.

Rotocel Operations

The Rotocel operations are subject to 40 CFR Part 63, Subpart FFFF (MON). These operations are continuous processes and thus are subject to the requirements for continuous process vents.

The Rotocel miscellaneous organic chemical process unit (MCPU) has previously been determined in the MON Notification of Compliance Status (NOCS) report as having a Group 2 continuous process vent based on a calculated TRE value of > 1.9. The TRE accounts for the two 19,500-gallon process/storage tanks (ID Nos. ES-125A and ES-125B). The two 19,500-gallon process/storage tanks when only storing material would never achieve a vapor pressure threshold to change the determination from Group 2 storage tanks. Equipment leaks comply via 40 CFR Part 63, Subpart UU. There are only Group 2 process wastewater streams from the Rotocel MCPU; however, wastewater is discharged to a 95% efficient biological treatment system. There are no transfer racks in the Rotocel MCPU.

There are no changes associated with these operations that must be reflected in a notification or semiannual report. Avoca is not requesting any updates for the process vents, equipment leaks, storage tanks, fugitives or wastewater requirements for MON.

Recovery Operations

The Recovery operations are subject to the (MON). These operations are continuous processes and thus are subject to the requirements for continuous process vents.

The Recovery MCPU vents emissions from the Acron process tank (ID No. M-1), stripper (ID No. T-5), and receiver (ID No. M-21) process vents to the Rotocel MCPU control device. The TRE calculated for Rotocel includes the Recovery MCPU contribution and therefore determined to be Group 2. Additionally, there are other continuous process vents (not venting to the Rotocel control device) in the Rotocel MCPU that have been determined to be Group 2. There is one Group 2 storage tank (ID No. M-25) with no control requirements. Equipment leaks comply via 40 CFR Part 63, Subpart UU. There is one Group 1 process wastewater stream from the Recovery MCPU that is discharged to – and controlled by – the 95% efficient biological treatment system. There are no transfer racks in the Recovery MCPU.

There are no changes associated with these operations that must be reflected in a notification or semiannual report. Avoca is not requesting any updates for the process vents, equipment leaks, storage tanks, fugitives or wastewater requirements for MON.

Concrete Operations

These operations are not currently operating. The current permit indicates the Concrete Operations are subject to MON and, if they operate, Avoca will submit an NOCS update prior to utilizing HAP. Avoca is not requesting any updates to this scenario at this time.

Sclareol Recrystallization (SFG) Operation

The SFG operations were previously subject to the MON due to the use of n-hexane. Avoca changed operations and is no longer using a HAP in these operations and thus SFG is no longer subject to MON.

Sclarecolide Operations (SDE-1 and SDE-2)

SDE Operations (SDE-1) utilize n-hexane (HAP) in the process and as such was determined to be subject to the existing source requirements under the MON. The existing SDE-1 was determined to be a Group 2 source under Subpart FFFF and therefore for compliance the facility tracked the number of each type of batch in order to remain a Group 2 batch process with batch process vent emissions less than 10,000 lb/yr.

The SDE equation is:

Organic HAP = [2.27*(pounds/ tank fill) x* B_{tf}] + [4.80*(pounds/batch) x* B_{reg}] + [3.66*(pounds/batch) x* B_{rec}] + [4.19*(pounds/batch) x* B_{tc}]

Where: B_{reg} = The number of regular batches processed in the SDE Operations; and
B_{rec} = The number of recrop batches processed in the SDE Operations
B_{tc} = The number of third crop batches processed in the SDE Operations; and
B_{tf} = The number of hexane tank (M-2) fills.

The SDE-1 MCPU does not have any MON-subject storage tanks; all are considered to be process tanks. If any of the process tanks were used as storage tanks, all would potentially be Group 2 because they are less than 10,000 gallons in size. Equipment leaks comply via 40 CFR Part 63, Subpart UU. There are only Group 2 process wastewater streams from the SDE-1 MCPU; however, wastewater is discharged to a 95% efficient biological treatment system. There are no transfer racks in the SDE-1 MCPU.

The SDE-1 operations have not operated since March 2017. Avoca request to keep this process permitted in the event there is a need for future operation.

SDE-2 MCPU was determined to be a new source under the MON. It has Group 1 batch process vents, and thus must reduce the organic HAP by > 95%. The emissions from SDE-2 are controlled with a Mineral Oil System (MOS System) which consists of a chilled water condenser (ID No. CD-4002) and mineral oil scrubber (ID No. 4003-S). Avoca is monitoring the following:

- Process gas temperature into the absorber is not > 105F°
- Mineral oil temperature into the absorber is not > 105F°
- Mineral oil temperature in the stripper is not < 200F°
- Mineral oil flowrate to the stripper is not > 10 gpm and
- Install calibrate and operate a flow indicator at the inlet and outlet of control device to identify no flow.

The SDE-2 MCPU has one MON-subject storage tank that is a Group 1 tank. The virgin hexane material tank (ID No. T-4001) is 17,900 gallons. The tank has a total HAP maximum true vapor pressure of approximately 13.6 kPa. The tank will be vented in the closed vent system to the MOS system and thus is reduced by 95%. Equipment leaks comply via 40 CFR Part 63, Subpart UU. Wastewater is discharged to a 95% efficient biological treatment system. There are no transfer racks in the SDE-2 MCPU.

Ethyl Vanillin Glucoside (EVG) Operations

The EVG operations are subject to the MON since the operations have the potential to utilize methanol and chloroform (trichloromethane).

The current permit contains the following equation for Group 2 batch process vents;

Organic HAP = [1.0(*pounds/batch*) x *B*]

Where: B = The number of batches processed in the EVG Operations

The EVG MCPU does not have any MON-subject storage tanks; all are considered to be process tanks. If any of the process tanks were used as storage tanks, all would potentially be Group 2 because they are less than 10,000 gallons in size. Equipment leaks comply via 40 CFR Part 63, Subpart UU. There are only Group 2 process wastewater streams from the EVG MCPU; however, wastewater is discharged to a 95% efficient biological treatment system. There are no transfer racks in the EVG MCPU.

There are no changes associated with these operations that must be reflected in a notification or semiannual report. Avoca is not requesting any updates for the equipment leaks, storage tanks, fugitives or wastewater requirements for MON.

40 CFR Part 63, Subpart ZZZZ – Stationary Reciprocating Internal Combustion Engines (RICE MACT)

The MACT standard for stationary reciprocating internal combustion engines (RICE) was first promulgated on June 15, 2004, and only regulated existing and new stationary RICE at major sources of HAP with a site rating > 500 brake horsepower (hp).

On February 17, 2010, EPA finalized the newest portions of the RICE NESHAP. Under these new regulations, many previously unregulated engines, including those designated for emergency use, became subject to federal regulations, including emissions standards, control requirements, or management practices.

A stationary RICE is "existing" if it commenced construction or reconstruction before December 19, 2002, for RICE with a site rating of > 500 hp located at a major source of HAP. A stationary RICE is "existing" if it commenced construction or reconstruction before June 12, 2006, for RICE with a site rating of < 500 hp located at a major source of HAP.

The Avoca Merry Hill plant has the following emergency units at the site subject to 40 CFR Part 63, Subpart ZZZZ:

- One No. 2 fuel oil-fired emergency generator (**ID No. E105**, 2,935 hp) and associated catalytic oxidizer (ID No. CD-CatOx1) that was installed on May 12, 2005. As such, this unit is considered a "new" source.
- Three No. 2 fuel oil-fired emergency generators (**ID Nos. E101, E102, and E104**, 587 hp, 760 hp, and 401 hp, respectively) that were constructed before June 12, 2006, and therefore are all considered "existing sources"; and
- One compression ignition emergency fire pump (**ID No. FP**, 285 hp) that was constructed before June 12, 2006, and therefore is an "existing source."

Engine E104 and FP (Units <500 hp)

Based on the hp ratings these engines must meet the requirements listed below:

During Startup:

- Minimize the engine's time spent at idle and minimize the engine's startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes.

Work Practice Standards:

- Change oil and filter every 500 hours of operation or annually, whichever comes first;
- Inspect air cleaner every 1,000 hours of operation or annually, whichever comes first;
- Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary;
- Install non-resettable hours meter; and
- Operate and maintain the engine and after-treatment control device (if any) according to the manufacturer's emission – related written instructions or develop a maintenance plan.

Recordkeeping:

- Copies of Notifications
  - Occurrence and duration of each malfunction of engine, control or monitoring equipment
  - Records of maintenance performed
  - Actions taken during malfunction to minimize emissions
  - Records of hours of operation recorded with non-resettable hours meter
  - Records to show continuous compliance with operating and maintenance requirements.

Reporting:

- Semiannual report of monitoring and recordkeeping activities

All engines (E101, E102, E104 and FP) and E105

- Must be in compliance with emission limitations and operating limitations at all times.
- Operate and maintain source in a manner consistent with safety and good air pollution control practices for minimizing emissions.
- Operation other than emergency, maintenance, and testing, emergency demand response and operation in non-emergency more than 50 hours per year is prohibited.
  - No time limit for emergency operations
  - May operate engine for following times for a maximum of 100 hours each calendar year:
    - Maintenance checks and readiness testing
    - Emergency demand response
    - Periods where a deviation of voltage or frequency of 5% or greater below standard voltage or frequency.
- Emergency stationary RICE may be operated for up to 50 hours per calendar year in non-emergency situations. The 50 hours of operation in non-emergency situations are counted as part of the 100 hours per calendar year for maintenance and testing and emergency demand response. The 50 hours per year for non-emergency situations cannot be used for peak shaving or non-emergency demand response, or to generate income for a facility to supply power to an electric grid or otherwise supply power as part of a financial arrangement with another entity.

This permit renewal does not affect these requirements. Continued compliance is expected.

40 CFR Part 63, Subpart DDDD – Boiler and Process Heater NESHAP

40 CFR Part 63, Subpart DDDDD applies to industrial, commercial, and institutional boilers and process heaters located at a major source of HAP emissions. An affected source is any existing, new or reconstructed industrial, commercial, and institutional boilers and process heaters located at a major source of HAP emissions.

Three boilers at this facility are classified as new sources per 40 CFR 63.7490(b) since the units are located at a major source of HAP and commenced construction on or after June 4, 2010; (ID Nos. ES-BB1, ES-BB2, and H-104). There are also two existing boilers (ID Nos. H-101 and H-102). These boilers fire ultra-low sulfur diesel (ULSD) fuel.

Biomass Boilers (ES-BB1 and ES-BB2)

The biomass boilers are considered stokers designed to burn biomass/bio-based solid (40 CFR 63.7499(d)). The boilers must comply with the emission limitations in Table 1, work practice standards in Table 3, and operating limits in Table 4 of Subpart DDDDD.

The boilers have demonstrated compliance with the following emission limits found in Table 1 for a stoker designed to burn biomass / bio-based solids.

- PM: 0.03 lb/MMBtu heat input
- HCL: 0.022 lb/MMBtu heat input
- CO: 620 ppm by volume
- Hg 8.0 E-07 lb/MMBtu heat input

The boilers have complied with the work practices standards in Table 3 for a new unit subject to emission limits:

- Minimize the unit's startup and shutdown periods following the manufacturer's recommended procedures.
- The facility has developed operating limits for the boilers listed in Table 4.
- The bagfilter installed on the boilers is equipped with a bag leak detection system.

Performance Testing

Avoca performed testing for the boilers on February 21, 2013, and December 19, 2013 and demonstrated compliance. Per 40 CFR 63.7515(b), Avoca conducted two consecutive tests with each limit less than 75% of the standard. As such, a retest of the boilers are increased to within 37 months of the last test. Avoca has performed subsequent testing on December 14, 2016, and December 19, 2019. The next test is required January 19, 2023.

Operating Limits

The following criteria as outlined in Table 4 of Subpart DDDDD were utilized to establish the operating limits:

- Fabric Filter Control: Install and operate a bag leak detection system according to 40 CFR 63.7525 and operate such that the alarm does not sound more than 5% of the operating time during each 6-month period.
- Performance Testing: Maintain the operating load of each unit such that it does not exceed 110% of the highest hourly average operating load recorded during the most recent test.
- Oxygen Analyzer System: For boilers and process heaters subject to CO emission limit that demonstrate compliance with an O2 analyzer system as specified in 40 CFR 63.7525(a), maintain the 30-day rolling average oxygen content at or above the lowest hourly average oxygen concentration measured during the CO performance test, as specified in Table 8. *This requirement does not apply to units that install an oxygen trim system since these units will*

set the trim system to the level specified in 40 CFR 63.7525(a). The boilers at Avoca are equipped with an oxygen trim system.

During the last performance testing the operating limits were set as follows using the Subpart DDDDD regulations:

- Boilers are equipped with a bag leak detection system.
- Operating Load: The operating limit is 1.1 times this maximum load or 24,049 lb/hr total steam output [from December 2019 test]
- Oxygen Limit: The minimum oxygen content recorded by the oxygen trim system during the performance test was 10.2% for Boiler 1 and 8.6% for Boiler 2 [from December 2019 test]. Per 40 CFR 63.7525(a)(7), operate an oxygen trim system with the oxygen level set no lower than the lowest hourly average oxygen concentration measured during the most recent CO performance test as the operating limit for oxygen according to Table 7 of this subpart.

Fuel Testing

Avoca is not performing fuel testing as a method of demonstrating compliance.

Monitoring / Recordkeeping and Reporting

Avoca is keeping records of all oxygen and steam outputs from the boilers. The bag leak detection data is also recorded and maintained electronically. Per 40 CFR 63.7550, Avoca is submitting semiannual reports as outlined in Table 9 and uploading data to the CEDRI system.

Energy Assessment (EA) Requirement

The one-time EA is not required for new boilers.

Tune-Up Requirements

Per Table 3, new boilers with a continuous trim system must perform a tune up every 5 years (last tune up was September 1, 2021)

Notice of Compliance Status

The last NOCS for ES-BB1 and ES-BB2 was submitted February 6, 2020.

Two No. 2 Fuel Oil-Fired Boilers (H-101 and H-102)

The ULSD fired boilers at the Avoca site are considered existing affected under Subpart DDDDD. The boilers are designed to fire ULSD No. 2 fuel oil, and are rated at 20.3 MMBtu/hr each. The boilers are classified as units designed to burn light liquid subcategory (40 CFR 63.7499(u)). The boilers are required to document compliance with the emission limits in Table 2 to Subpart DDDDD.

- PM: 0.0079 lb/MMBtu heat input
- HCL: 0.0011 lb/MMBtu heat input
- CO: 130 ppm by volume on a dry basis, 3% O_2
- Hg: 2.0 E-06 lb/MMBtu heat input

Performance Testing / Monitoring/Recordkeeping and Reporting

Testing was performed on August 20 and 21, 2019 and documented compliance. Per 40 CFR 63.7515(h) units designed to burn light liquid fuel and that combust ULSD do not need to conduct further performance tests if compliance is demonstrated during the initial testing and they demonstrate ongoing compliance with emission limits by monitoring and recordkeeping the type of fuel combusted on a monthly basis.

Fuel Testing

Avoca is not performing fuel testing as a method of demonstrating compliance.

Energy Assessment (EA) Requirement

The one-time EA was required for existing boilers H-101 and H-102. The EA was completed on May 9, 2019.

Tune Up Requirements

Per Table 3, new and existing boilers without a continuous trim system and heat capacity greater than 10 MMBtu/hr must perform an annual tune-up. The last annual tune-up was performed on July 13, 2021.

Notice of Compliance Status

The NOCS for H-101 and H-102 was submitted October 3, 2019 for this one-time test.

Propane Boiler (H-104)

The propane boiler is not subject to emission limits or testing requirements. The boiler will be a "unit designed to burn gas 1 subcategory" since it fires propane and will be subject to the work practice standards in Table 3 in Subpart DDDDD.

Tune-Up Requirements

Initial tune-up for the boilers at the facility (Table 3 of the rule)

- No continuous trim system and heat capacity greater than 10 MMBtu/hr: Tune up with 13 months of startup.

Subsequent Tune-up Requirements [40 CFR 63.7515(d)]

- No continuous trim system: Each annual tune-up must be no more than 13 months after the previous tune-up.

Energy Assessment (EA) Requirements

An EA is not required for new boiler H-104

Recordkeeping Requirements

Records of the dates and the results of each required boiler tune-up.

Reporting Requirements

Periodic Compliance Reporting:

The boilers are subject only to a requirement to conduct a annual tune-up, and not subject to emission limits or operating limits. Therefore, Avoca may submit an annual compliance report, as applicable instead of a semi-annual compliance report [40 CFR 63.7750(b)].

- The annual report must be postmarked or submitted no later than January 31.
- Electronic compliance reporting under CEDRI electronic system is operational and reports should be uploaded to the system.

Avoca states in their application that all Compliance reports have been submitted by January 31 each year and uploaded into CEDRI.

Notice of Compliance Status

If there is an initial compliance requirement, then a NOCS is required.
Since this is a new boiler:

1. a tune-up at start-up was not required;
2. an energy assessment was not required; and
3. performance testing was not required.

Thus, an NOCS is not required for this unit.

The applicability of this Subpart to these sources is not affected with this renewal. Continued compliance is expected.

PSD

North Carolina has implemented the federal PSD requirements of 40 CFR 51.166 under North Carolina Regulation 15A NCAC 02D .0530. The PSD program regulates emissions from major stationary sources of regulated air pollutants. For the purposes of the PSD program, a major stationary source is defined as any one of the following;

1. *Any stationary source that is listed as one of the 28 named source categories in Title 40 of the Code of Federal Regulations (40 CFR), Part 51.166(b)(1)(i) which emits, or has the potential to emit, 100 tons per year (tpy) or more of any pollutant subject to regulation under the ACT;*

2. *Any stationary source that is not listed as one of the 28 named source categories in 40 CFR Part 51.166(b)(1)(i) which emits, or has the potential to emit, 250 tons per year (TPY) or more of any pollutant subject to regulation under the ACT.*

According to the application, the Avoca facility has previously been identified by DAQ as a chemical plant and is a 100 tpy major source. The facility is currently operating under PSD BACT requirements for multiple sources as well as PSD avoidance conditions for several emission sources. Avoca is not requesting any changes to the current permit conditions.

112(r) – The facility is not subject to Section 112(r) of the Clean Air Act requirements because it does not store one or more of the regulated substances in quantities above the thresholds in the Rule. This permit modification does not affect this status.

CAM

40 CFR Part 64 is applicable to any pollutant-specific emission unit, if the following three conditions are met:

- the unit is subject to any (non-exempt: e.g. pre November 15, 1990, Section 111 or Section 112 standard) emission limitation or standard for the applicable regulated pollutant.
- the unit uses any control device to achieve compliance with any such emission limitation or standard.
- the unit's pre-control potential emission rate exceeds either 100 tpy (for criteria pollutants) or 10/25 tpy (for HAP's).

Avoca has previously evaluated Part 64 and has determined that four emission sources are subject to this rule and CAM is included in the current permit.

The applicability analysis for the sources that are equipped with a control device and evaluated for CAM are shown in the following table below.

Source Name	DAQ Applicable Rule	Pollutant	Uncontrolled Emissions (tons/yr)	Major Source Threshold (tons/yr)	Subject to CAM/
Rotocel Operations	15A NCAC 02D .0530	VOC	>100	100	**Yes – included in the current permit**
Recovery Operations	15A NCAC 02D .0530	VOC	>100	100	**Yes – included in the current permit**
Sclareol Recrystallization (SFG)	15A NCAC 02D .0530	VOC	>100	100	No
Sclareolide (SDE-1)	No Applicable Regulation	VOC	NA	100	No
Sclareolide (SDE-2)	15A NCAC 02D .1111 MACT Subpart FFFF	VOC/HAP	>100	100	No – see below
Plant Nutrient Extraction (PNE)	No Applicable Regulation	VOC	NA	100	No
Ethyl Vanillin Glucoside (EVG)	No Applicable Regulation	VOC	NA	100	No
Botanical Exaction	15A NCAC 02D .0530	VOC	>100	100	**Yes – included in the current permit**

Biomass Extraction	15A NCAC 02D .0530	VOC	>100	100	**Yes – included in the current permit**
Biomass Boilers ES-BB1 & ES-BB2	15A NCAC 02D .1111 MACT Subpart DDDDD	PM	NA	100	No – see below
Emergency Generator E105	No Applicable Regulation	NO_x	NA	100	No – see below

SDE-2

SDE-2 are subject to 40 CFR 63, Subpart FFFF, and therefore exempt from applicability to CAM for the control of VOC. Based on the above information, SDE-2 is not subject to the CAM regulations.

Biomass Boilers ES-BB1 and ES-BB2

The boilers are subject to 40 CFR 63, Subpart DDDDD, and therefore exempt from the applicability to CAM for the control of PM. Based on the above information, the boilers are not subject to CAM regulations.

Emergency Generator E105

The limited use generator is equipped with a catalytic oxidizer which controls VOC and CO. The avoidance limit is for NOx which is not controlled by the control device. Thus, the unit is not applicable to CAM since the unit does not use a control device to achieve compliance with any such emission limitation or standard.

VII. Facility Wide Air Toxics

15A NCAC 02D .1100: Control of Toxic Air Pollutant Emissions

A toxic air pollutant (TAP) permit application shall include an evaluation of the TAP emissions from a facility for any non-NESHAP source. See discussion in 15A NCAC 02Q .0700: "Toxic Air Pollutant Procedures."

15A NCAC 02Q .0700: Toxic Air Pollutant Procedures

This rule establishes procedures for documenting compliance for a modification that results in an increase in NC air toxics. Compliance can be demonstrated by:

1. Documenting that facility wide emissions are below the thresholds in 15A NCAC 02Q .0711
2. Netting to show there has been a no net increase in NC air toxics; or
3. Modeling to document compliance with the ambient levels in 15A NCAC 02D .1100.

Based upon recent legislative action exempting sources subject to 40 CFR Part 61 or Part 63 from the North Carolina Air Toxics program, sources that are subject to a MACT or GACT requirement would be exempt from the NC Air Toxics program and the associated modeling requirements. Certain operations are subject to the MON NESHAP and Avoca previously provided a model that

documented compliance with NC Air Toxics in the April 2013 construction application. Permit Condition 2.2 A.1 simply states for any non-NESHAP source, any increase in toxic air pollutants must be evaluated. Avoca's toxics limitations were removed from permit T40. As allowed under Session Law 2012-91 House Bill 952, the facility is not required to evaluate toxics from MACT sources (the burden belongs to DAQ). All of the modeled toxics sources are MACT, FFFF, DDDDD, or ZZZZ affected. Changes in toxics emissions due to the modifications made under T40 and T41 were modeled by Avoca and reviewed by Alexander Zarnowski (5/01/2013) and Tom Anderson (5/16/2013). The DAQ permit reviews stated that the modifications did not pose unacceptable toxics health risks. Modifications in T42 through T52 did not require re-modeling by DAQ Permits.

Avoca requested removal of all NC Air Toxics from the permit since all sources of air toxics are covered under a NESHAP. DAQ has thus removed all TAPs from the permit.

VIII. Facility Emissions Review

See Table in the header for a summary of the actual emissions as reported to DAQ from the years 2015 to 2019.

IX. Stipulation Review

The facility was last inspected by Betsy Huddleston on **1/25/2019, 1/29/2019 and 1/30/2019** (Inspection Report – **04/26/2019**). Based on her observations the facility appeared to be in compliance with their Title V permit requirements.

X. Affected State(s) Review

A notice of the DRAFT Title V Permit shall be made pursuant to 15A NCAC 02Q .0521. The notice will provide for a 30-day comment period, with an opportunity for a public hearing. Consistent with 15A NCAC 02Q .0525, the EPA will have a concurrent 45-day review period. Copies of the public notice shall be sent to persons on the Title V mailing list and EPA. Pursuant to 15A NCAC 02Q .0522, a copy of each permit application, each proposed permit and each final permit pursuant shall be provided to EPA. Also, pursuant to 02Q .0522, a notice of the DRAFT Title V Permit shall be provided to each affected State at or before the time notice is provided to the public under 02Q .0521.

XI. Conclusions, Comments, and Recommendations

PE Seal

Pursuant to 15A NCAC 02Q .0112 "Application Requiring a Professional Engineering Seal," a professional engineer's seal (PE Seal) is required to seal technical portions of air permit applications for new sources and modifications of existing sources as defined in Rule .0103 of this Section that involve:

(1) design;
(2) determination of applicability and appropriateness; or
(3) determination and interpretation of performance; of air pollution capture and control systems.

A professional engineer's seal (PE Seal) was not required for this renewal.

Zoning

A zoning consistency determination was not required for this renewal.

Recommendations

WaRO recommends issuance of the permit and was sent a DRAFT permit prior to issuance (See Section III of this document for a discussion).

The Raleigh Central Office (RCO) concurs with WaRO's recommendation to issue the Air Permit No. 01819T54.