STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
17 STATE HOUSE STATION AUGUSTA, MAINE 04333-0017

DEPARTMENT ORDER

Ensyn Fuels Inc. **Penobscot County** **East Millinocket, Maine** **A-1162-71-A-N**	**Departmental** **Findings of Fact and Order** **Air Emission License**

FINDINGS OF FACT

After review of the air emission license application, staff investigation reports, and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 Maine Revised Statutes (M.R.S.) § 344 and § 590, the Maine Department of Environmental Protection (Department) finds the following facts:

I. REGISTRATION

A. Introduction

Ensyn Fuels Inc. (Ensyn) has applied for an Air Emission License for the operation of emission sources associated with their renewable fuel oil production facility.

The equipment addressed in this license is located at 50 Main St, East Millinocket, Maine.

B. Title, Right, or Interest

In their application, Ensyn submitted copies of a property lease demonstrating ownership of the facility. Ensyn has provided sufficient evidence of title, right, or interest in the facility for purposes of this air emission license.

C. Emission Equipment

The following equipment is addressed in this air emission license:

Fuel Burning Equipment

Equipment	Max. Capacity (MMBtu/hr)	Maximum Firing Rate	Fuel Type, % sulfur	Date of Manuf.	Date of Install.	Stack #
RTP and Dryer	67.7	1,449 lb/hr	RTP Filter Cake, negligible	TBD	TBD	1
		78,699 lb/hr	Hot flue gas from RTP process, 3.32E-05 lb SO_2 per lb char			
		7,455 lb/hr	Pyrolysis Gas			
RTP Propane Burner	23.0	251.37 gal/hr*	Propane, negligible	TDB	TDB	
Dryer Propane Burner	35.0	328.5 gal/hr*	Propane, negligible	TDB	TDB	
RTO	11.0	120.22 gal/hr*	Propane, negligible	TBD	TBD	

* Based on assumed heating value of 0.0915 MMBtu/gal

Stationary Engine

Equipment	Max. Input Capacity (MMBtu/hr)	Rated Output Capacity (HP)	Fuel Type, % sulfur	Firing Rate (gal/hr)	Date of Manuf.	Date of Install.
Generator #1	3.29	470	Distillate fuel, 0.0015%	24	TBD	TBD

Ensyn may operate small stationary engines smaller than 0.5 MMBtu/hr. These engines are considered insignificant activities and are not required to be included in this license. However, they are still subject to applicable State and Federal regulations. More information regarding requirements for small stationary engines is available on the Department's website at the link below.
http://www.maine.gov/dep/air/publications/docs/SmallRICEGuidance.pdf

Additionally, Ensyn may operate portable engines used for maintenance or emergency-only purposes. These engines are considered insignificant activities and are not required to be included in this license. However, they may still be subject to applicable State and Federal regulations.

Process Equipment

Equipment	Production Rate	Pollution Control Equipment
Product Loading	24.4 MMgal/yr	Vapor Collection
Primary Hammermill	330,000 TPY green biomass (wood chips)	Cyclone
Secondary Hammermill	<330,000 TPY	Cyclone
Cooling Tower	495,005 gal/hr	Drift Eliminators

Storage Tanks

Equipment	Capacity (gallons)	Control Equipment	Date of Manuf.	Date of Install.
RFO Filter Tank	44,305	RTO	TBD	TBD
RFO Day Tank #1	74,591	RTO	TBD	TBD
RFO Day Tank #2	74,591	RTO	TBD	TBD
RFO Day Tank #3	74,591	RTO	TBD	TBD
RFO Storage Tank #1	500,038	RTO	TBD	TBD
RFO Storage Tank #2	500,038	RTO	TBD	TBD

D. Definitions

Distillate Fuel means the following:

- Fuel oil that complies with the specifications for fuel oil numbers 1 or 2, as defined by the American Society for Testing and Materials (ASTM) in ASTM D396;
- Diesel fuel oil numbers 1 or 2, as defined in ASTM D975;
- Kerosene, as defined in ASTM D3699;
- Biodiesel, as defined in ASTM D6751; or
- Biodiesel blends, as defined in ASTM D7467.

Records or *Logs* mean either hardcopy or electronic records.

E. Application Classification

All rules, regulations, or statutes referenced in this air emission license refer to the amended version in effect as of the date this license was issued.

A new source is considered a major source based on whether or not total licensed annual emissions exceed the "Significant Emission" levels as defined in the Department's *Definitions Regulation*, 06-096 Code of Maine Rules (C.M.R.) ch. 100.

Pollutant	Total Licensed Annual Emissions (tpy)	Significant Emission Levels
PM	13.5	100
PM_{10}	9.1	100
SO_2	0.8	100
NO_x	80.9	100
CO	26.6	100
VOC	4.2	100

The Department has determined the facility is a minor source, and the application has been processed through *Major and Minor Source Air Emission License Regulations*, 06-096 C.M.R. ch. 115.

F. Facility Classification

With the annual operating hours restriction on the emergency generator (Generator #1) and Dryer Bypass Stack, the facility is licensed as follows:

- As a synthetic minor source of air emissions for NO_x and CO, because Ensyn is subject to license restrictions that keep facility emissions below major source thresholds for criteria pollutants; and
- As an area source of hazardous air pollutants (HAP), because the licensed emissions are below the major source thresholds for HAP.

II. BEST PRACTICAL TREATMENT (BPT)

A. Introduction

In order to receive a license, the applicant must control emissions from each unit to a level considered by the Department to represent Best Practical Treatment (BPT), as defined in *Definitions Regulation*, 06-096 C.M.R. ch. 100. Separate control requirement categories exist for new and existing equipment.

BPT for new sources and modifications requires a demonstration that emissions are receiving Best Available Control Technology (BACT), as defined in *Definitions Regulation*, 06-096 C.M.R. ch. 100. BACT is a top-down approach to selecting air emission controls considering economic, environmental, and energy impacts.

B. Process Description

Ensyn plans to construct and operate a bio-refinery for the production of Renewable Fuel Oil (RFO) from biomass (wood chips) using the company's patented Rapid Thermal Process Technology (RTP®). Ensyn estimates approximately 165,000 tons (bone dry) of biomass, received in the form of wood chips at approximately 50% moisture content, will produce approximately 20 million gallons of biocrude annually. The facility will include feedstock receiving, storage, size reduction equipment, and drying systems, as well as RTP Technology components, biocrude conditioning and storage, pollution abatement equipment, and utilities.

Green biomass wood chips will enter the facility via truck and be screened to remove any grossly oversized pieces (overs). The accepted material is then conveyed to a covered green chip storage area that can accommodate storage of approximately seven days' worth of material. The material will then be transferred by frontend loader to a reclaim bin, from which biomass is conveyed to the primary hammermill for size reduction. Oversized pieces will be routed to a secondary hammermill. The material from the primary hammermill is stored in a covered storage area that can accommodate two days' worth of material. This sized biomass material is transferred by a frontend loader to another reclaim bin, from which the material is conveyed to the Dryer metering bin.

The wood chips are dried in the Dryer from 50% moisture to 6% moisture prior to the RTP process. Excess energy in the Dryer will be tempered with a water spray to prevent over-drying of the biomass. The heat source to dry the biomass (called either the Furnace or Dryer Furnace) will fire propane during startup, but during normal operation, it will be fueled solely by products from the RTP process: RTP flue gas, pyrolysis gas, and filter cake solids (from the biocrude liquid conditioning system).

Exhaust gases from the Furnace are to be ducted to the Dryer for direct-contact drying of the wood chips. A bypass stack between the Furnace and the Dryer allows combustion gases from the Furnace to vent to atmosphere during an upset condition in the Dryer. Biomass in the Dryer is directed to a fire dump during any upset conditions in the Dryer.

Dried biomass exiting the Dryer will be separated from the exiting gases by use of a cyclone and conveyed to storage silos that feed the RTP process. The dry biomass is converted in the RTP process to three products:

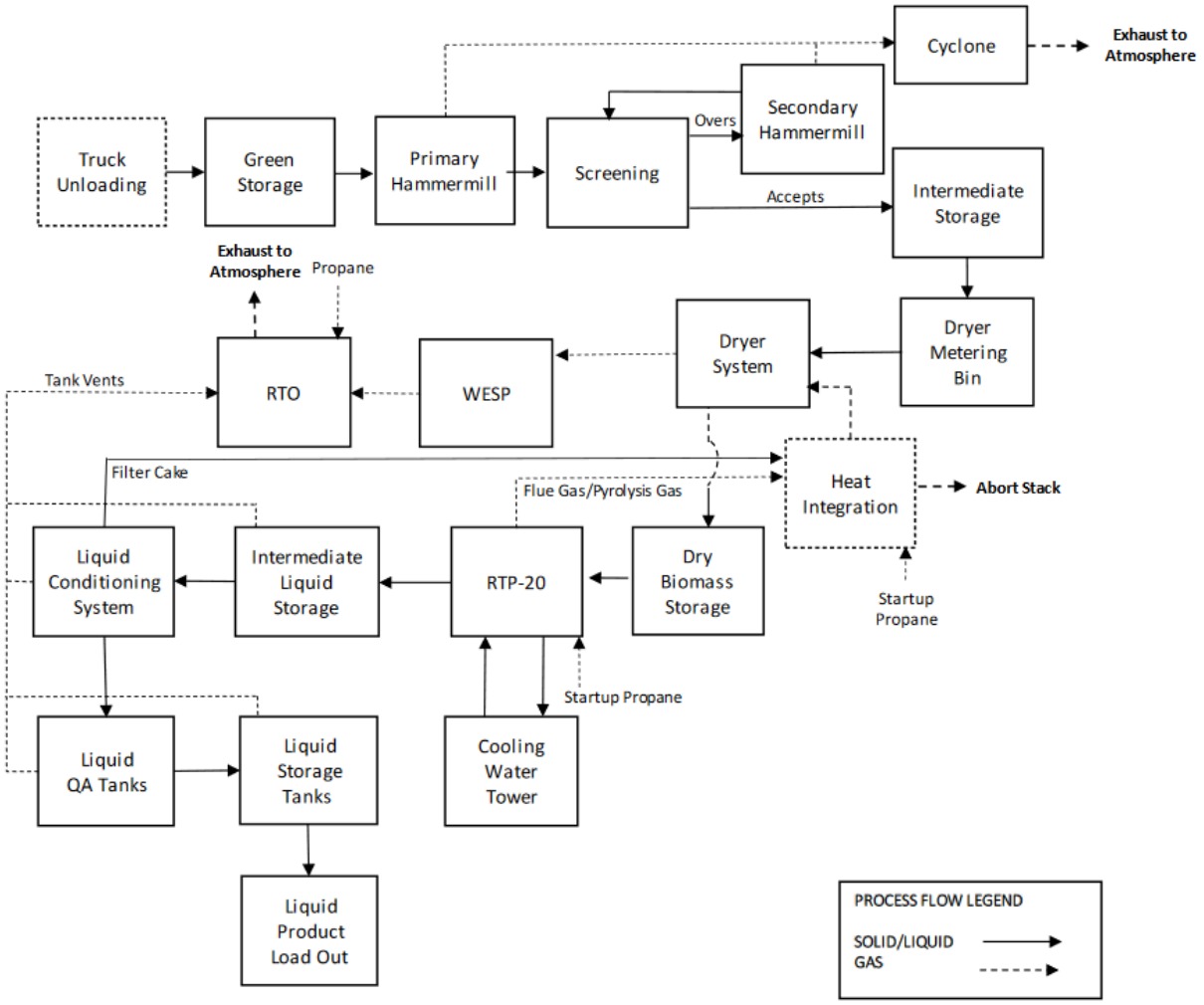
1) a liquid product (renewable fuel oil);
2) a pyrolysis gas by-product that is used in the Dryer Furnace; and
3) a char product which is consumed in the RTP process to generate the necessary heat.

Ash from the char is collected in covered bins for disposal.

The liquid product is collected in a tank before being filtered to remove any fine solid material. Filter cake (a.k.a., RTP Filter Cake) from filtering the liquid product is used as a fuel in the Dryer Furnace. The filtered liquid is stored in a set of day tanks from which its

quality can be determined before being sent to a set of product storage tanks. The liquid can then be loaded into tanker trucks or rail tankers for shipping.

Cooling water required by the RTP and filtration processes is supplied by a wet forced draft cooling tower. An emergency generator (Generator #1) is also onsite and available to provide short-term power to safely shut down the equipment during power interruptions.



C. RTP and Dryer Process

The RTP and Dryer processes are closely coupled, with the Dryer using all available heat from the RTP flue gas, by-product pyrolysis gas combustion, and filter cake combustion. The RTP-Dryer process has a maximum heat input capacity of 67.7 MMBtu/hr during normal operation. The RTP and Dryer are also equipped with propane burners (23.0 MMBtu/hr and 35 MMBtu/hr, respectively) that will be used for startup. The RTP is expected to fire propane during start-ups for up to 360 hours/year. Similarly, the Dryer is expected to fire propane during start-ups for up to 72 hours/year. However, the maximum

calculated potential emissions from the RTP and drying process occur assuming normal operation for 8,760 hours of the year. The Dryer is assumed to be operating only when RTP is operating. An additional 120 hours were included in the calculated emissions to accommodate for upsets where gases generated in the RTP will vent through the bypass stack.

1. BACT Findings

Ensyn submitted a BACT analysis for control of emissions from the RTP and Dryer process, which is summarized below.

a. Particulate Matter (PM, PM_{10}, $PM_{2.5}$)

Ensyn evaluated baghouse (fabric) filters, mechanical separators (cyclones), wet scrubbers, and electrostatic precipitators (ESP) as potential technologies for the control of particulate matter emissions from the exhaust stack associated with the RTP and Dryer process.

Baghouses use bags made of woven fabric or felt materials to remove particulate from process gas streams. Baghouses typically have filterable material collection efficiencies between 95% and 99.9%. High moisture levels in the exhaust stream can cause a baghouse filter to clog, resulting in frequent maintenance and downtime. Because of the expected moisture level in this exhaust stream, a baghouse is not considered technically feasible for the RTP and Dryer process.

Cyclones use centrifugal forces to separate particulate matter from a gas stream. Cyclones are primarily used for PM with aerodynamic diameters greater than 10 microns and are less effective for smaller diameter PM. Control efficiencies for high-efficiency cyclones typically range from 80-99% for total PM, 60-95% for PM_{10}, and 20-70% for $PM_{2.5}$. Higher control efficiencies require a larger pressure drop across the cyclone, which increases the energy requirement and operating costs of the cyclonic separator. When high collection efficiency and high throughput are required, multiple cyclones can be operated in parallel (multiclone); however, this increases the pressure drop and operating costs as well. A high-efficiency cyclone is a technically feasible abatement strategy for control of PM emissions from this facility.

Wet scrubbers are used to remove PM by inertial or diffusional impaction with a sorbent or reagent slurry. The particulate-laden gas stream is contacted with liquid droplets generated by spray nozzles. The gas stream is then passed through a mist eliminator to remove entrained liquid droplets. Wet scrubber efficiency can range from 70-99%; however, they are typically not used for fine particulate removal due to the high liquid-to-gas ratios required and low efficiencies. A review of the EPA

RBLC[1] did not find similar rotary dryers employing wet scrubbers for PM abatement.

A wet or dry ESP removes particulates from a gas stream through the use of electrical forces. The entrained particles are ionized as they pass through a corona discharge. Electrodes in the center of the flow maintain an electrical field which causes the negatively charged particles to collect on the walls of the flow lane. The collectors are periodically cleaned by mechanical means. Collection efficiency of an ESP is affected by the resistivity of the dust particles to be collected, the particle size distribution, the gas temperature, and the composition of the gas and dust particles. Wet ESPs are designed to operate with humid air streams and are unaffected by dust resistivity. Additionally, much smaller particles can be collected with a wet ESP due to the lack of resistivity concerns and reduced re-entrainment potential during cleaning, with approximate control efficiencies of 90% for total PM, 88% for PM_{10}, and 80% for $PM_{2.5}$. A wet ESP has been successfully used for PM abatement at a similar RTP facility with rotary dryer. A wet ESP with a quench system to pre-treat the gas stream is considered technically feasible to control PM emissions for this application. Due to the higher control efficiencies across sizes of PM, Ensyn has proposed the use of a wet ESP as BACT for control of particulate matter.

The Department finds that BACT for $PM/PM_{10}/PM_{2.5}$ for the RTP and Dryer processes is the use of a wet ESP and the emission limits listed in the tables below.

b. Sulfur Dioxide (SO_2)

Ensyn has proposed to fire propane for startup and to fire RTP filter cake, flue gas, and process gas for normal operations. The use of these fuels results in minimal emissions of SO_2, and additional add-on pollution controls are not economically feasible.

The Department finds that BACT for SO_2 emissions from the RTP and Dryer processes is the emission limits listed in the tables below.

c. Nitrogen Oxides (NO_x)

Thermal NO_x is typically managed using low NO_x burners by controlling the introduction of air into the flame area to reduce the peak flame temperature and reduce the formation of thermal NO_x. The RTP, dryer furnace, and RTO will use standard low NO_x burners when firing propane to minimize thermal NO_x.

[1] EPA's RACT/BACT/LAER Clearinghouse (RBLC) is a permit database of air pollution technology information, including past Reasonably Available Control Technology (RACT), Best Available control Technology (BACT), and Lowest Achievable Emission Rate (LAER) decisions contained in New Source Review (NSR) permits.

During normal RTP operation, flue gas from char combustion will be the primary source of NO_x emissions due to fuel-bound nitrogen present in the biomass feedstock. Char combustion in the RTP reheater does not produce flames, leading to significantly lower process temperatures at which formation of thermal NO_x will be minimized.

During normal operation, the main fuel for the Dryer burner will be the RTP by-products of pyrolysis gas and supplemental filter cake. Pyrolysis gas combustion occurs at lower temperatures than propane or natural gas due to the water content and presence of inert gases which reduces the potential for thermal NO_x formation. The grate furnace used for filter cake combustion will incorporate staged combustion air to limit the formation of thermal NO_x.

The Department finds that BACT for NO_x emissions from the RTP and Dryer process is the use of low NO_x propane burners in the dryer furnace, RTP, and RTO, and the emission limits listed in the tables below.

d. Carbon Monoxide (CO) and Volatile Organic Compounds (VOC)

Ensyn considered several control strategies for the control of CO and VOC including adsorption, biofiltration, thermal oxidation, and catalytic oxidation.

Adsorption technologies remove contaminants from a gas stream, often using activated carbon. The contaminants are periodically desorbed from the carbon and recovered or thermally destroyed depending on the application. Activated carbon adsorption systems are often used for VOC and HAP, but not typically for CO removal. Activated carbon adsorption systems are less effective for compounds that are highly polar, highly volatile, or have small diameters. Such compounds will be present in the exhaust gas stream from the Dryer. Furthermore, activated carbon adsorption is less effective with gas streams that have high relative humidity as water will readily adsorb on the carbon, hindering the filter's ability to remove other contaminants. Due to these reasons, adsorption systems are not considered to be a technically feasible option for VOC and CO abatement for this application.

Biofiltration uses microbes to remove VOC and CO from a gas stream. The exhaust gas stream is humidified if necessary and passed through a bed of composting material containing an active population of bacteria and other microorganisms. The pollutants are metabolized by the microbes to carbon dioxide and water. Biofilters work best at steady state conditions and do not tolerate extended periods of downtime, temperature swings, and changes in flowrate or available moisture. Downtime and maintenance are scheduled into the yearly operation of an RTP facility, so extended periods of downtime cannot be avoided. Biofilters also require a large footprint which may not be available at the proposed site. A search of the RBLC does not show biofilters being used on any comparable rotary dryer system. For these reasons, a biofilter is not considered to be technically feasible.

Thermal oxidation systems are the standard control technology for VOC, CO, and HAP from direct-fired rotary dryers. Thermal oxidation systems can achieve significant destruction of these pollutants by raising the temperature of the gas stream high enough that the pollutants are oxidized to carbon dioxide and water. Regenerative thermal oxidizers (RTOs) utilize heat exchangers to preheat the waste gas stream and recover waste heat from the treated effluent and reduce the amount of additional fuel that must be used to oxidize the pollutants. RTOs are relatively intolerant to particulate matter, which can foul the heat exchange media. A search of the RBLC shows several RTOs being used to treat the exhaust streams from rotary dryers. An RTO is considered a technically feasible abatement technology for this application.

The Department finds that BACT for CO and VOC emissions from the RTP and Dryer Process is the use of an RTO and the emission limits listed in the tables below.

e. Emission Limits

The BACT emission limits for the RTP and Dryer Process were based on combined emission factors from the RTP flue gas, by-product pyrolysis gas combustion, filter cake combustion, rotary dryer emissions, and RTO emissions. The emission factors for the flue gas and filter cake combustion were derived from source testing at an existing facility using the same technology. The pyrolysis gas emission factors were based on natural gas combustion.

The Dryer emission factors were calculated based on AP-42 sources for rotary drum dryers with direct-fired natural gas fuel. Because the RTP process provides all the necessary heat (except during startup), any emissions that result from natural gas combustion during normal operation were subtracted from the AP-42 Dryer emission factors, and the net "drying of material only" emissions were added to emissions from combustion of the RTP products.

The BACT emission limits for the RTP and Dryer process are the following:

Unit	PM (lb/hr)	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)	SO_2 (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
RTP and Dryer Process*	2.5	1.9	1.7	0.2	18.3	5.7	0.8
Dryer Bypass Stack	17.6	13.6	6.4	0.2	17.6	30.2	0.2

*Includes any supplemental propane firing by the RTO.

2. Visible Emissions

   Visible emissions from Stack #1 or the Dryer Bypass Stack shall not exceed an opacity of 20 percent on a six-minute block average basis, except for periods of startup, shutdown, or malfunction, during which time visible emissions shall not exceed 40% opacity on a six-minute block average basis, and Ensyn shall comply with the following work practice standards

   a. Maintain a log (written or electronic) of the date, time, and duration of all startups, shutdowns, and malfunctions during which the higher opacity limit applies.

   b. Develop and implement a written startup and shutdown plan for the RTP and Dryer Process.

   c. The duration of unit startups, shutdowns, malfunctions or equipment maintenance shall each not exceed one hour per occurrence.

   d. The RTP and Dryer Process, including any associated air pollution control equipment, shall be operated at all times in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Department that may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the unit.

3. Ensyn shall limit use of the Dryer Bypass Stack to no more than 120 hours/year on a 12-month rolling total basis.

4. Periodic Monitoring

   a. Periodic monitoring for the RTP and Dryer Process shall include recordkeeping to document biomass input in tons both on a monthly and 12-month rolling total basis.

   b. Ensyn shall maintain records documenting use of the Dryer Bypass Stack. Documentation shall include the date, time, and duration of each use of the Dryer Bypass Stack. Documentation shall also include the reason for each bypass event and how it was resolved.

D. Generator #1

Ensyn plans to install and operate one emergency generator. The emergency generator is a generator set consisting of an engine and an electrical generator. Generator #1 has an engine rated at 3.29 MMBtu/hr which fires distillate fuel.

1. BACT Findings

The BACT emission limits for Generator #1 are based on the following:

PM/PM_{10}	- 0.12 lb/MMBtu from 06-096 C.M.R. ch. 103
SO_2	- combustion of distillate fuel with a maximum sulfur content not to exceed 15 ppm (0.0015% sulfur by weight)
NO_x	- 4.41 lb/MMBtu from AP-42 Table 3.3-1 dated 10/96
CO	-0.95 lb/MMBtu from AP-42 Table 3.3-1 dated 10/96
VOC	- 0.35 lb/MMBtu from AP-42 Table 3.3-1 dated 10/96
Visible Emissions	- 06-096 C.M.R. ch. 101

The BACT emission limits for Generator #1 are the following:

Unit	Pollutant	lb/MMBtu
Generator #1	PM	0.12

Unit	PM (lb/hr)	PM_{10} (lb/hr)	SO_2 (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Generator #1	0.39	0.39	0.01	14.51	3.13	1.15

Visible emissions from Generator #1 shall not exceed 20% opacity on a six-minute block average basis.

BACT for Generator #1 includes recordkeeping of all maintenance conducted on the engine.

2. Chapter 169

Stationary Generators, 06-096 C.M.R. ch. 169 (Chapter 169), is applicable to Generator #1. It is an emergency generator powered by an engine with a rated output of less than 1,000 brake horsepower (747 kW). Chapter 169 identifies emission standards for generator engines subject to this chapter and stack height requirements for certain generator engines subject to this chapter.

a. Chapter 169 Emission Standards Requirements

For Generator #1, Ensyn shall comply with the emission standards for emergency generators by complying with the applicable standards contained in 40 C.F.R. Part 60, Subpart IIII. [06-096 C.M.R. ch. 169, § 4(B)(1)]

b. Chapter 169 Stack Height Requirements

Chapter 169 identifies stack height requirements for any stack used to exhaust a generator engine or combination of generator engines with a combined rated output equal to or greater than 1,000 brake horsepower (747 kW). Individual generator engines with a maximum power capacity of less than 300 kW are not included in the assessment of the combined generator power capacity exhausted through a common stack. Generator #1 has a rated output of less than 1,000 brake horsepower and therefore not subject to any Chapter 169 stack height requirements. [06-096 C.M.R. ch. 169, § 6]

3. New Source Performance Standards

Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, 40 C.F.R. Part 60, Subpart IIII is applicable to the emergency engine listed above since the unit was ordered after July 11, 2005, and manufactured after April 1, 2006. [40 C.F.R. § 60.4200] By meeting the requirements of 40 C.F.R. Part 60, Subpart IIII, the unit also meets the requirements found in the *National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*, 40 C.F.R. Part 63, Subpart ZZZZ. [40 C.F.R. § 63.6590(c)]

A summary of the currently applicable federal 40 C.F.R. Part 60, Subpart IIII requirements is listed below.

a. Emergency Engine Designation and Operating Criteria

Under 40 C.F.R. Part 60, Subpart IIII, a stationary reciprocating internal combustion engine (ICE) is considered an **emergency** stationary ICE (emergency engine) as long as the engine is operated in accordance with the following criteria. Operation of an engine outside of the criteria specified below may cause the engine to no longer be considered an emergency engine under 40 C.F.R. Part 60, Subpart IIII, resulting in the engine being subject to requirements applicable to **non-emergency** engines.

(1) Emergency Situation Operation (On-Site)

There is no operating time limit on the use of an emergency engine to provide electrical power or mechanical work during an emergency situation. Examples of use of an emergency engine during emergency situations include the following:

- Use of an engine to produce power for critical networks or equipment (including power supplied to portions of a facility) because of failure or interruption of electric power from the local utility (or the normal power source, if the facility runs on its own power production);
- Use of an engine to mitigate an on-site disaster;

- Use of an engine to pump water in the case of fire, flood, natural disaster, or severe weather conditions; and
- Similar instances.

(2) Non-Emergency Situation Operation

An emergency engine may be operated up to a maximum of 100 hours per calendar year for maintenance checks, readiness testing, and other non-emergency situations as described below.

(i) An emergency engine may be operated for a maximum of 100 hours per calendar year for maintenance checks and readiness testing, provided that the tests are recommended by federal, state, or local government; the manufacturer; the vendor; the regional transmission organization or equivalent balancing authority and transmission operator; or the insurance company associated with the engine. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that federal, state, or local standards require maintenance and testing of emergency ICE more than 100 hours per calendar year.

(ii) An emergency engine may be operated for up to 50 hours per calendar year for other non-emergency situations. **However, these operating hours are counted as part of the 100 hours per calendar year operating limit described in paragraph (2) and (2) (i) above.**

The 50 hours per calendar year operating limit for other non-emergency situations cannot be used for peak shaving, demand response, or to generate income for a facility by providing power to an electric grid or otherwise supply power as part of a financial arrangement with another entity.

[40 C.F.R. §§ 60.4211(f) and 60.4219]

b. 40 C.F.R. Part 60, Subpart IIII Requirements

(1) Manufacturer Certification Requirement
The engine shall be certified by the manufacturer as meeting the emission standards for new nonroad compression ignition engines found in 40 C.F.R. § 60.4202. [40 C.F.R. § 60.4205(b)]

(2) Ultra-Low Sulfur Fuel Requirement
The fuel fired in the engine shall not exceed 15 ppm sulfur (0.0015% sulfur). [40 C.F.R. § 60.4207(b)]

(3) Non-Resettable Hour Meter Requirement
A non-resettable hour meter shall be installed and operated on the engine. [40 C.F.R. § 60.4209(a)]

(4) Operation and Maintenance Requirements
The engine shall be operated and maintained according to the manufacturer's emission-related written instructions. Ensyn may only change those emission-related settings that are permitted by the manufacturer. [40 C.F.R. § 60.4211(a)]

(5) Annual Time Limit for Maintenance and Testing
As an emergency engine, the unit shall be limited to 100 hours/year for maintenance checks and readiness testing. Up to 50 hours/year of the 100 hours/year may be used in non-emergency situations (this does not include peak shaving, demand response, or to generate income for a facility by providing power to an electric grid or otherwise supply power as part of a financial arrangement with another entity). [40 C.F.R. § 60.4211(f)]

(6) Initial Notification Requirement
No initial notification is required under 40 C.F.R. Part 60, Subpart IIII for emergency engines. [40 C.F.R. § 60.4214(b)]

(7) Recordkeeping
Ensyn shall keep records that include the hours of operation of the engine recorded through the non-resettable hour meter. Documentation shall include the number of hours the unit operated for emergency purposes, the number of hours the unit operated for non-emergency purposes, and the reason the engine was in operation during each time. [40 C.F.R. § 60.4214(b)]

E. Process Equipment

1. Primary and Secondary Hammermills

The Primary Hammermill will be used to grind the full throughput of green chips that are required to meet the particle specifications and capacity for the RTP process. The Secondary Hammermill will be used to grind the portion of green chips that are rejected as overs by the screening process. It is expected that the overs will be approximately 20% of the total screen throughput. Both Hammermills will be electrically driven. The equipment will be sized for a higher capacity than the RTP process to allow for downtime for maintenance. Both Primary and Secondary Hammermills will be vented to a cyclone for control of PM. Emissions are expected to be minimal and unquantifiable.

Visible emissions from the Primary and Secondary Hammermill cyclones shall not exceed 20 percent opacity on a six-minute block average basis.
[06-096 C.M.R. ch. 101, § 3(B)(4)]

2. Cooling Tower

Cooling water required by the RTP process will be supplied by a wet forced draft Cooling Tower. PM emissions from the Cooling Tower are a result of dissolved solids that exist in the droplets that are carried away as drift. Drift eliminators will help reduce this loss by capturing and returning the droplets to the circulating cooling water flow. Emissions from the Cooling Tower are directly affected by the concentration of solids in the cooling water and the cooling water circulation rate.

Ensyn has estimated PM emissions and particle size distribution using methodology described by Reisman and Frisbie in "Calculating Realistic PM_{10} Emissions from Cooling Towers" (2002)[2].

Emission limits for the Cooling Tower are the following:

Pollutant	lb/hr
PM	0.310
PM_{10}	0.049
$PM_{2.5}$	0.0004

3. RFO Tanks

Ensyn will utilize several storage tanks for the processing and storage of RTP liquid.

- RFO Filter Tank: The RFO Filter Tank will be a 44,305-gallon, fixed-roof, stainless steel tank used to store the RTP liquid before it is filtered.
- RFO Day Tanks: Three 74,591-gallon, vertical, fixed-roof RFO Day Tanks will be used to store the filtered RTP liquid for quality assurance checks.
- RFO Storage Tanks: The RTP liquid will then move to two vertical, fixed-roof RFO Storage Tanks with capacities of 500,038 gallons each, from which it will be loaded into rail tankers for transportation.

As material is added to each of the RFO Filter Tank, RFO Day Tanks, and RFO Storage Tanks, headspace gases will vent to a common header where they will be collected and directed to the RTO which has an expected control efficiency of 95% for VOC emissions.

BACT for the RFO Filter Tank, RFO Day Tanks, and RFO Storage Tanks shall be the following:

a. Annual emissions from the RFO Filter Tank, RFO Day Tanks, and RFO Storage Tanks shall be calculated on a 12-month rolling total basis according to the procedures found in AP-42 Ch. 7, *Liquid Storage Tanks*. Based on the expected

[2] Available at Calculating Realistic PM10 Emissions From Cooling Towers (arapenv.com)

maximum annual throughput, annual VOC emissions shall not exceed the following:

Tanks	Annual VOC Emissions (ton/yr)
RFO Filter Tank	0.1
RFO Day Tanks (3)	--
RFO Storage Tanks (2)	0.22

b. Ensyn shall conduct routine visual inspections of the tanks and associated transfer piping and fittings at least once every month and shall maintain records documenting any detected leaks and the corrective action taken.

c. VOC emissions from the RFO Filter Tank, RFO Day Tanks, and RFO Storage Tanks shall be controlled by routing gases from the tank headspace to an RTO. The RTO shall be in operation at all times that any of the RFO tanks are receiving material.

4. Product Loading

The filtered RTP liquid product will be loaded into rail cars and tank trucks for transportation. Gaseous emissions during the loading will be controlled with a vapor collection and recovery system with an overall efficiency of 93.8%. This vapor control efficiency is based two factors: the vapor recovery efficiency (95%) and vapor collection efficiency (98.7%). The vapor recovery efficiency was estimated to be an average of the range of 90 to over 99% as stated in AP-42, ch. 5.2. The vapor recovery efficiency is based on the standard required for tankers to pass the NSPS-level annual leak test.

Annual emissions from Product Loading vapor losses were estimated using equations from AP-42, ch. 5.2.

Annual VOC emissions from Product Loading shall not exceed the following:

Emission Source	Annual VOC Emissions (ton/yr)
Product Loading	0.22

F. Fugitive Emissions

Visible emissions from a fugitive emission source (including stockpiles and roadways) shall not exceed 20% opacity on a five-minute block average basis.

G. General Process Emissions

Visible emissions from any general process source shall not exceed 20% opacity on a six-minute block average basis.

H. Performance Testing

Within 180 days of initial operation of the RTP and Dryer Process, Ensyn shall conduct performance tests on Stack #1 to demonstrate compliance with the lb/hr emission limits for $PM_{2.5}$ (filterable and condensable), NO_x, and VOC from the RTP and Dryer Process. Ensyn shall use EPA stack test methods specified in the table below or other methods approved by the Department.

Pollutant	Compliance Method
$PM_{2.5}$ (filterable + condensable)	Method 201A and Method 202
NO_x	Method 7E
VOC	Method 25A

For any performance testing required by this license, Ensyn shall submit to the Department for approval a performance test protocol, as outlined in the Department's Performance Testing Guidance, at least 30 days prior to the scheduled date of the performance test. [06-096 C.M.R. ch. 115, BPT]

The Department's Performance Testing Guidance is available online at: https://www.maine.gov/dep/air/emissions/testing.html

I. Emission Statements

Ensyn is subject to emissions inventory requirements contained in *Emission Statements*, 06-096 C.M.R. ch. 137. Ensyn shall maintain the following records in order to comply with this rule:

1. The sulfur content of the distillate fuel fired in Generator #1;
2. Calculations of the emissions from the RTP and Dryer Process on a 12-month rolling total basis;
3. Hours that the Dryer Bypass Stack was in use on a 12-month rolling total basis;
4. Throughput of each of the RFO Filter Tanks, RFO Day Tanks, and RFO Storage Tanks, and calculations of the annual emissions from the tanks; and
5. Hours each emission unit was operating on a monthly basis.

In reporting year 2023 and every third year thereafter, Ensyn shall report to the Department emissions of hazardous air pollutants as required by 06-096 C.M.R. ch. 137, § (3)(C). The Department will use these reports to calculate and invoice for the applicable annual air quality surcharge for the subsequent three billing periods. Ensyn shall pay the annual air

quality surcharge, calculated by the Department based on these reported emissions of hazardous air pollutants, by the date required in Title 38 M.R.S. § 353-A(3). [38 M.R.S. § 353-A(1-A)]

J. Annual Emissions

The table below provides an estimate of facility-wide annual emissions for the purposes of calculating the facility's annual air license fee and establishing the facility's potential to emit (PTE). Only licensed equipment is included, i.e., emissions from insignificant activities are excluded. Similarly, unquantifiable fugitive particulate matter emissions are not included except when required by state or federal regulations. Maximum potential emissions were calculated based on the following assumptions:

- Operating the RTP and Dryer Process for 8,760 hrs/yr, with 120 hrs/yr use of the Dryer Bypass Stack;
- Operating Generator #1 for 100 hrs/yr; and
- Approximately 24.43 million gal/yr finished product throughput.

This information does not represent a comprehensive list of license restrictions or permissions. That information is provided in the Order section of this license.

Total Licensed Annual Emissions for the Facility
Tons/year
(used to calculate the annual license fee)

	PM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	VOC
RTP and Dryer Process	11.0	8.12	7.20	0.77	79.04	24.62	3.60
Dryer Bypass Stack	1.1	0.8	0.4	--	1.1	1.8	--
Generator #1	--	--	--	--	0.73	0.2	0.06
Cooling Tower	1.4	0.2	--	--	--	--	--
RFO Filter Tank	--	--	--	--	--	--	0.1
RFO Day Tanks	--	--	--	--	--	--	--
RFO Storage Tanks	--	--	--	--	--	--	0.2
Product Loading	--	--	--	--	--	--	0.2
Total TPY	**13.5**	**9.1**	**7.6**	**0.8**	**80.9**	**26.6**	**4.2**

Pollutant	Tons/year
Single HAP	9.9
Total HAP	24.9

III. AMBIENT AIR QUALITY ANALYSIS

A. Overview

A screening modeling analysis was performed to demonstrate that emissions from Ensyn, in conjunction with other sources, will not cause or contribute to violations of National Ambient Air Quality Standards (NAAQS) for SO_2, PM_{10}, $PM_{2.5}$, NO_2, or CO or to Class II increments for SO_2, PM_{10}, $PM_{2.5}$, or NO_2.

Since Ensyn is a minor source, it has been determined by MEDEP-BAQ that an assessment of Class I Air Quality Related Values (AQRVs) is not required.

B. Model Inputs

The AERSCREEN dispersion model was used to address NAAQS and increment impacts. AERSCREEN produces estimates of worst-case 1-hour concentrations for a single source and includes internal conversion factors to estimate the worst-case 3-hour, 8-hour, 24-hour, and annual concentrations. AERSCREEN is intended to produce predicted impacts that are equal to or greater than the impacts produced by AERMOD with a fully developed set of meteorological and terrain data, but with an additional degree of conservatism.

All modeling was performed in accordance with all applicable requirements of the Maine Department of Environmental Protection, Bureau of Air Quality (MEDEP-BAQ) and the United States Environmental Protection Agency (USEPA).

The meteorological database used in the AERSCREEN modeling was developed using USEPA's pre-processer MAKEMET. The MAKEMET program interfaces with AERSCREEN to generate a site-specific matrix of surface and profile meteorological conditions based on user inputs. The inputs used in the Ensyn modeling analysis are listed in Table III-1:

TABLE III-1 : Ensyn MAKEMET Input Parameters

Variable	Input Value
Minimum Ambient Air Temperature	240K
Maximum Ambient Air Temperature	311K
Minimum Wind Speed	0.5 m/s
Anemometer Height	10 m
Adjust U* Option	Selected
Surface Characteristics	Coniferous Forest
Moisture	Average

Point-source parameters used in the Ensyn modeling analysis are listed in Table III-2. The modeling analyses accounted for the potential of building wake effects on emissions from

all modeled stacks that are below their respective formula good engineering practice (GEP) stack heights.

TABLE III-2 : Ensyn Point Source Stack Parameters

Stack	Stack Base Elevation (m)	Stack Height (m)	GEP Stack Height (m)	Stack Diameter (m)	UTM Easting NAD83 (m)	UTM Northing NAD83 (m)
CURRENT/PROPOSED						
• Stack #1 (Dryer Stack)	94.89	27.43	91.44	1.54	532,976	5,052,357
2012 BASELINE ($PM_{2.5}$ INCREMENT)						
• Ensyn did not exist during the 2012 baseline year, no $PM_{2.5}$ credits to be taken.						
1987 BASELINE (NO_2 INCREMENT)						
• Ensyn did not exist during the 1987 baseline year, no NO_2 credits to be taken.						
1977 BASELINE (SO_2/PM_{10} INCREMENT)						
• Ensyn did not exist during the 1977 baseline year, no SO_2/PM_{10} credits to be taken.						

Emission parameters for Ensyn for NAAQS and Class II increment modeling are listed in Table III-3 and are based on the maximum license allowed operating configuration.

For the purpose of determining maximum predicted impacts, the following assumptions were used:

- all NO_x emissions were conservatively assumed to convert to NO_2 (USEPA Tier I Method);
- all PM_{10} emissions were explicitly modeled as PM_{10}; and
- all $PM_{2.5}$ emissions were explicitly modeled as $PM_{2.5}$.

TABLE III-3 : Ensyn Stack Emission Parameters

Stack	Averaging Periods	SO_2 (g/s)	PM_{10} (g/s)	$PM_{2.5}$ (g/s)	NO_x (g/s)	CO (g/s)	Stack Temp (K)	Stack Velocity (m/s)
MAXIMUM LICENSE ALLOWED								
• Stack #1 (Dryer Stack)	All	0.022	0.370	0.210	2.305	0.718	397.0	17.19
2012 BASELINE ($PM_{2.5}$ INCREMENT)								
• Ensyn did not exist during the 2012 baseline year, no $PM_{2.5}$ credits to be taken.								
1987 BASELINE (NO_2 INCREMENT)								
• Ensyn did not exist during the 1987 baseline year, no NO_2 credits to be taken.								
1977 BASELINE (SO_2/PM_{10} INCREMENT)								
• Ensyn did not exist during the 1977 baseline year, no SO_2/PM_{10} credits to be taken.								

C. Single Source Modeling Impacts

AERSCREEN modeling was performed for a total of four Ensyn operating scenarios that represented a range of maximum (100%), high-typical (90%), low-typical (75%), and

minimum (60%) operations. Emissions and flow rates from the 90%, 75%, and 60% operating scenarios were linearly scaled from the 100% operating scenario.

The model results for Ensyn alone are shown in Table III-4. Maximum predicted impacts that exceed their respective significance level are indicated in boldface type.

TABLE III-4 : Maximum AERSCREEN from Ensyn Alone

Pollutant	Averaging Period	Max Impact ($\mu g/m^3$)	Class II Significance Level ($\mu g/m^3$)
SO_2	1-hour	1.13	**7.9**
	3-hour	1.13	**25**
PM_{10}	24-hour	**7.17**	**5**
$PM_{2.5}$	24-hour	**6.35**	**1.2**
	Annual	**1.06**	**0.2**
NO_2	1-hour	**116.29**	**7.5**
	Annual	**11.63**	**1**
CO	1-hour	36.23	**2,000**
	8-hour	32.61	**500**

D. Combined Source Modeling Impacts

As indicated in boldface type in Table III-4, other sources not explicitly included in the modeling analysis must be accounted for by using representative background concentrations for the area.

Background concentrations, listed in Table III-5, are derived from representative rural background data for use in the Northern Maine region.

TABLE III-5 : Background Concentrations

Pollutant	Averaging Period	Background Concentration ($\mu g/m^3$)	Site Name, Location, Data Years
SO_2	1-hour	4	Mic Mac Site, Presque Isle, 2017 - 2019
	3-hour	3	
PM_{10}	24-hour	46	CKP Site, Lewiston, 2018 - 2020
$PM_{2.5}$	24-hour	14	CKP Site, Lewiston, 2018 - 2020
	Annual	5	
NO_2	1-hour	28	MEDEP Site, Gardiner, 2017 - 2019
	Annual	3	
CO	1-hour	1660	Mic Mac Site, Presque Isle, 2017 - 2019
	8-hour	772	

MEDEP examined other nearby sources to determine if any impacts would be significant in or near Ensyn's significant impact area. Due to Ensyn's location, extent of the

significant impact area, and nearby source's emissions, MEDEP has determined that no other sources would be explicitly considered for combined-source modeling.

The maximum AERSCREEN modeled impacts were added with conservative rural background concentrations to demonstrate compliance with NAAQS, shown in Table III-6.

Because all pollutant/averaging period impacts using this method meet NAAQS, no further NAAQS modeling analyses needed to be performed.

TABLE III-6 : Maximum Combined Sources Impacts

Pollutant	Averaging Period	Maximum Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
SO_2	1-hour	1.13	4	5.13	196
	3-hour	1.13	3	4.13	1,300
PM_{10}	24-hour	7.17	46	53.17	150
$PM_{2.5}$	24-hour	6.35	14	20.35	35
	Annual	1.06	5	6.06	12
NO_2	1-hour	116.29	28	144.29	188
	Annual	11.63	3	14.63	100
CO	1-hour	36.23	1660	1696.23	40,000
	8-hour	32.61	772	804.61	10,000

E. Class II Increment

The AERSCREEN model was also used to predict maximum Class II increment impacts.

Results of Ensyn's Class II increment analysis are shown in Tables III-7. All modeled maximum increment impacts were below all increment standards. Because all predicted increment impacts meet increment standards, no additional Class II SO_2, PM_{10}, $PM_{2.5}$, and NO_2 increment modeling needed to be performed.

TABLE III-7 : Maximum Class II Increment Consumption

Pollutant	Averaging Period	Max Impact ($\mu g/m^3$)	Class II Increment ($\mu g/m^3$)
SO_2	3-hour	1.13	512
	24-hour	0.68	91
	Annual	0.11	20
PM_{10}	24-hour	7.17	30
	Annual	1.20	17
$PM_{2.5}$	24-hour	6.35	9
	Annual	1.06	4
NO_2	Annual	11.63	25

F. Summary

In summary, it has been demonstrated that Ensyn in its proposed configuration will not cause or contribute to a violation of any SO_2, PM_{10}, $PM_{2.5}$, NO_2, or CO NAAQS or to Class II increments for SO_2, PM_{10}, $PM_{2.5}$, or NO_2.

ORDER

Based on the above Findings and subject to conditions listed below, the Department concludes that the emissions from this source:

- will receive Best Practical Treatment,
- will not violate applicable emission standards, and
- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

The Department hereby grants Air Emission License A-1162-71-A-N subject to the following conditions.

Severability. The invalidity or unenforceability of any provision of this License or part thereof shall not affect the remainder of the provision or any other provisions. This License shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.

STANDARD CONDITIONS

(1) Employees and authorized representatives of the Department shall be allowed access to the licensee's premises during business hours, or any time during which any emissions units are in operation, and at such other times as the Department deems necessary for the purpose of performing tests, collecting samples, conducting inspections, or examining and copying records relating to emissions (38 M.R.S. § 347-C).

(2) The licensee shall acquire a new or amended air emission license prior to commencing construction of a modification, unless specifically provided for in Chapter 115. [06-096 C.M.R. ch. 115]

(3) Approval to construct shall become invalid if the source has not commenced construction within eighteen (18) months after receipt of such approval or if construction is discontinued for a period of eighteen (18) months or more. The Department may extend this time period upon a satisfactory showing that an extension is justified, but may condition such extension upon a review of either the control technology analysis or the ambient air quality standards analysis, or both. [06-096 C.M.R. ch. 115]

(4) The licensee shall establish and maintain a continuing program of best management practices for suppression of fugitive particulate matter during any period of construction,

reconstruction, or operation which may result in fugitive dust, and shall submit a description of the program to the Department upon request. [06-096 C.M.R. ch. 115]

(5) The licensee shall pay the annual air emission license fee to the Department, calculated pursuant to Title 38 M.R.S. § 353-A. [06-096 C.M.R. ch. 115]

(6) The license does not convey any property rights of any sort, or any exclusive privilege. [06-096 C.M.R. ch. 115]

(7) The licensee shall maintain and operate all emission units and air pollution systems required by the air emission license in a manner consistent with good air pollution control practice for minimizing emissions. [06-096 C.M.R. ch. 115]

(8) The licensee shall maintain sufficient records to accurately document compliance with emission standards and license conditions and shall maintain such records for a minimum of six (6) years. The records shall be submitted to the Department upon written request. [06-096 C.M.R. ch. 115]

(9) The licensee shall comply with all terms and conditions of the air emission license. The filing of an appeal by the licensee, the notification of planned changes or anticipated noncompliance by the licensee, or the filing of an application by the licensee for a renewal of a license or amendment shall not stay any condition of the license.
[06-096 C.M.R. ch. 115]

(10) The licensee may not use as a defense in an enforcement action that the disruption, cessation, or reduction of licensed operations would have been necessary in order to maintain compliance with the conditions of the air emission license.
[06-096 C.M.R. ch. 115]

(11) In accordance with the Department's air emission compliance test protocol and 40 C.F.R. Part 60 or other method approved or required by the Department, the licensee shall:

A. Perform stack testing to demonstrate compliance with the applicable emission standards under circumstances representative of the facility's normal process and operating conditions:
   1. Within sixty (60) calendar days of receipt of a notification to test from the Department or EPA, if visible emissions, equipment operating parameters, staff inspection, air monitoring or other cause indicate to the Department that equipment may be operating out of compliance with emission standards or license conditions; or
   2. Pursuant to any other requirement of this license to perform stack testing.

B. Install or make provisions to install test ports that meet the criteria of 40 C.F.R. Part 60, Appendix A, and test platforms, if necessary, and other accommodations necessary to allow emission testing; and

C. Submit a written report to the Department within thirty (30) days from date of test completion.

[06-096 C.M.R. ch. 115]

(12) If the results of a stack test performed under circumstances representative of the facility's normal process and operating conditions indicate emissions in excess of the applicable standards, then:

A. Within thirty (30) days following receipt of the written test report by the Department, or another alternative timeframe approved by the Department, the licensee shall re-test the non-complying emission source under circumstances representative of the facility's normal process and operating conditions and in accordance with the Department's air emission compliance test protocol and 40 C.F.R. Part 60 or other method approved or required by the Department; and

B. The days of violation shall be presumed to include the date of stack test and each and every day of operation thereafter until compliance is demonstrated under normal and representative process and operating conditions, except to the extent that the facility can prove to the satisfaction of the Department that there were intervening days during which no violation occurred or that the violation was not continuing in nature; and

C. The licensee may, upon the approval of the Department following the successful demonstration of compliance at alternative load conditions, operate under such alternative load conditions on an interim basis prior to a demonstration of compliance under normal and representative process and operating conditions.

[06-096 C.M.R. ch. 115]

(13) Notwithstanding any other provisions in the State Implementation Plan approved by the EPA or Section 114(a) of the CAA, any credible evidence may be used for the purpose of establishing whether a person has violated or is in violation of any statute, regulation, or license requirement. [06-096 C.M.R. ch. 115]

(14) The licensee shall maintain records of malfunctions, failures, downtime, and any other similar change in operation of air pollution control systems or the emissions unit itself that would affect emissions and that is not consistent with the terms and conditions of the air emission license. The licensee shall notify the Department within two (2) days or the next state working day, whichever is later, of such occasions where such changes result in an increase of emissions. The licensee shall report all excess emissions in the units of the applicable emission limitation. [06-096 C.M.R. ch. 115]

(15) Upon written request from the Department, the licensee shall establish and maintain such records, make such reports, install, use and maintain such monitoring equipment, sample such emissions (in accordance with such methods, at such locations, at such intervals, and in such a manner as the Department shall prescribe), and provide other information as the Department may reasonably require to determine the licensee's compliance status. [06-096 C.M.R. ch. 115]

(16) The licensee shall notify the Department within 48 hours and submit a report to the Department on a quarterly basis if a malfunction or breakdown in any component causes a violation of any emission standard (38 M.R.S. § 605). [06-096 C.M.R. ch. 115]

SPECIFIC CONDITIONS

(17) **RTP and Dryer Process**

A. Ensyn shall install and operate a wet ESP for control of PM emissions from the RTP and Dryer Process. [06-096 C.M.R. ch. 115, BACT]

B. Exhaust from the RTP and Dryer Process shall be routed to an RTO for control of CO and VOC emissions. [06-096 C.M.R. ch. 115, BACT]

C. Ensyn shall equip the dryer furnace, RTP, and RTO with low NO_x propane burners. [06-096 C.M.R. ch. 115, BACT]

D. Emissions shall not exceed the following [06-096 C.M.R. ch. 115, BACT]:

Emission Unit	PM (lb/hr)	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)	SO_2 (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
RTP and Dryer Process	2.5	1.9	1.7	0.2	18.3	5.7	0.8
Dryer Bypass Stack	17.6	13.6	6.4	0.2	17.6	30.2	0.2

E. Visible emissions from Stack #1 or the Dryer Bypass Stack shall not exceed an opacity of 20 percent on a six-minute block average basis, except for periods of startup, shutdown, or malfunction, during which time visible emissions shall not exceed 40% opacity on a six-minute block average basis, and Ensyn shall comply with the following work practice standards

1. Maintain a log (written or electronic) of the date, time, and duration of all startups, shutdowns, and malfunctions during which the higher opacity limit applies.

2. Develop and implement a written startup and shutdown plan for the RTP and Dryer Process.

3. The duration of unit startups, shutdowns, malfunctions or equipment maintenance shall each not exceed one hour per occurrence.

4. The RTP and Dryer Process, including any associated air pollution control equipment, shall be operated at all times in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Department that may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the unit.

[06-096 C.M.R. ch. 115, BACT]

F. Ensyn shall limit use of the Dryer Bypass Stack to no more than 120 hrs/yr on a 12-month rolling total basis. [06-096 C.M.R. ch. 115, BACT]

G. Ensyn shall maintain records documenting biomass input in tons to the RTP and Dryer Process on a monthly and 12-month rolling total basis. [06-096 C.M.R. ch. 115, BACT]

H. Ensyn shall maintain records documenting use of the Dryer Bypass Stack. Documentation shall include the date, time, and duration of each use of the Dryer Bypass Stack. Documentation shall also include the reason for each bypass event and how it was resolved. [06-096 C.M.R. ch. 115, BACT]

(18) **Generator #1**

A. Generator #1 shall be limited to 100 hours of operation per calendar year, excluding operating hours during emergency situations. [06-096 C.M.R. ch. 115, BACT]

B. Ensyn shall keep records of all maintenance conducted on the engine associated with Generator #1. [06-096 C.M.R. ch. 115, BACT]

C. Emissions shall not exceed the following:

Unit	Pollutant	lb/MMBtu	Origin and Authority
Generator #1	PM	0.12	06-096 C.M.R. ch. 103, § (2)(B)(1)(a)

D. Emissions shall not exceed the following [06-096 C.M.R. ch. 115, BACT]:

Unit	PM (lb/hr)	PM_{10} (lb/hr)	SO_2 (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Generator #1	0.39	0.39	0.01	14.51	3.13	1.15

E. Visible Emissions

Visible emissions from Generator #1 shall not exceed 20% opacity on a six-minute block average basis. [06-096 C.M.R. ch. 115, BACT]

F. Generator #1 shall meet the applicable requirements of 40 C.F.R. Part 60, Subpart IIII, including the following:
[incorporated under 06-096 C.M.R. ch. 115, BACT and 169]

1. Manufacturer Certification
The engine shall be certified by the manufacturer as meeting the emission standards for new nonroad compression ignition engines found in § 60.4202. [40 C.F.R. § 60.4205(b)]

2. Ultra-Low Sulfur Fuel
The fuel fired in the engine shall not exceed 15 ppm sulfur (0.0015% sulfur). Compliance with the fuel sulfur content limit shall be demonstrated by fuel delivery receipts from the supplier, fuel supplier certification, certificate of analysis, or testing of the tank containing the fuel to be fired. [40 C.F.R. § 60.4207(b) and 06-096 C.M.R. ch. 115, BACT]

3. Non-Resettable Hour Meter
A non-resettable hour meter shall be installed and operated on the engine. [40 C.F.R. § 60.4209(a)]

4. Annual Time Limit for Maintenance and Testing

a. As an emergency engine, the unit shall be limited to 100 hours/year for maintenance checks and readiness testing. Up to 50 hours/year of the 100 hours/year may be used in non-emergency situations (this does not include peak shaving, demand response, or to generate income for a facility by providing power to an electric grid or otherwise supply power as part of a financial arrangement with another entity). These limits are based on a calendar year. Compliance shall be demonstrated by records (electronic or written log) of all engine operating hours. [40 C.F.R. § 60.4211(f) and 06-096 C.M.R. ch. 115, BACT]

b. Ensyn shall keep records that include the hours of operation of the engine recorded through the non-resettable hour meter. Documentation shall include the number of hours the unit operated for emergency purposes, the number of hours the unit operated for non-emergency purposes, and the reason the engine was in operation during each time. [40 C.F.R. § 60.4214(b)]

5. Operation and Maintenance
The engine shall be operated and maintained according to the manufacturer's emission-related written instructions. Ensyn may only change those emission-related settings that are permitted by the manufacturer. [40 C.F.R. § 60.4211(a)]

(19) **Primary and Secondary Hammermills**

A. The Primary and Secondary Hammermills shall vent to a cyclone for PM control. [06-096 C.M.R. ch. 115, BACT]

B. Visible emissions from the Primary and Secondary Hammermills cyclones shall not exceed an opacity of 20 percent on a six-minute block average basis. [06-096 C.M.R. ch. 101, § 3(B)(4)]

(20) **Cooling Tower**

Emissions from the Cooling Tower shall not exceed the following [06-096 C.M.R. ch. 115, BACT]:

Pollutant	lb/hr
PM	0.310
PM_{10}	0.049
$PM_{2.5}$	0.0004

(21) **RFO Tanks**

A. Ensyn shall calculate annual emissions from the RFO Filter Tank, RFO Day Tanks, and RFO Storage Tanks on a 12-month rolling total basis according to the procedures in AP-42 Ch. 7, *Liquid Storage Tanks*. [06-096 C.M.R. ch. 115, BACT]

B. Annual VOC emissions from the RFO Filter Tank, RFO Day Tanks, and RFO Storage Tanks shall not exceed the following [06-096 C.M.R. ch. 115, BACT]:

Tanks	Annual VOC Emissions (ton/yr)
RFO Filter Tank	0.1
RFO Day Tanks (3)	--
RFO Storage Tanks (2)	0.22

C. Ensyn shall conduct routine inspections of the tanks and associated transfer piping and fittings at least once every month for any visible or audible leaks and shall maintain records documenting any detected leaks and the corrective action taken. [06-096 C.M.R. ch. 115, BACT]

D. VOC emissions from the RFO Filter Tank, RFO Day Tanks, and RFO Storage Tanks shall be controlled by routing vapors from each tank headspace to an RTO. The RTO shall be in operation at all times that any of the RFO tanks are receiving material. [06-096 C.M.R. ch. 115, BACT]

(22) **Product Loading**

Annual VOC emissions for Product Loading shall not exceed the following [06-096 C.M.R. ch. 115, BACT]:

Emission Source	Annual VOC Emissions (ton/yr)
Product Loading	0.22

(23) **Fugitive Emissions**

Visible emissions from a fugitive emission source (including stockpiles and roadways) shall not exceed 20% opacity on a five-minute block average basis. [06-096 C.M.R. ch. 101, § 3(C)]

(24) **General Process Sources**

Visible emissions from any general process source shall not exceed 20% opacity on a six-minute block average basis. [06-096 C.M.R. ch. 101, § 3(C)]

(25) **Performance Testing**

Within 180 days of startup of the RTP and Dryer Process, Ensyn shall conduct performance tests on Stack #1 to demonstrate compliance with the lb/hr emission limits for $PM_{2.5}$ (filterable and condensable), NO_x, and VOC from the RTP and Dryer Process. Ensyn shall use EPA stack test methods specified in the table below or other methods approved by the Department.

Pollutant	Compliance Method
$PM_{2.5}$ (filterable + condensable)	Method 201A and Method 202
NO_x	Method 7E
VOC	Method 25A

For any performance testing required by this license, Ensyn shall submit to the Department for approval a performance test protocol, as outlined in the Department's Performance Testing Guidance, at least 30 days prior to the scheduled date of the performance test.
[06-096 C.M.R. ch. 115, BPT]

(26) **Annual Emission Statements**

A. In accordance with *Emission Statements*, 06-096 C.M.R. ch. 137, Ensyn shall annually report to the Department, in a format prescribed by the Department, the information necessary to accurately update the State's emission inventory. The emission statement shall be submitted as specified by the date in 06-096 C.M.R. ch. 137.

B. Ensyn shall keep the following records in order to comply with 06-096 C.M.R. ch. 137:

1. The sulfur content of the distillate fuel fired in Generator #1;
2. Throughput of the RTP and Dryer Process on a 12-month rolling total basis;
3. Hours that the Dryer Bypass Stack was in use on a 12-month rolling total basis;
4. Throughput of each of the RFO Filter Tanks, RFO Day Tanks, and RFO Storage Tanks, and calculations of the annual emissions from the tanks; and
5. Hours each emission unit was active or operating on a monthly basis.

[06-096 C.M.R. ch. 137]

C. For reporting year 2023 and every third year thereafter, Ensyn shall report to the Department emissions of hazardous air pollutants as required by 06-096 C.M.R. ch. 137, § (3)(C). Ensyn shall pay the annual air quality surcharge, calculated by the Department based on these reported emissions of hazardous air pollutants, by the date required in Title 38 M.R.S. § 353-A(3).
[38 M.R.S. § 353-A(1-A)]

(27) If the Department determines that any parameter value pertaining to construction and operation of the proposed emissions units, including but not limited to stack size, configuration, flow rate, emission rates, nearby structures, etc., deviates from what was submitted in the application or ambient air quality impact analysis for this air emission license, Ensyn may be required to submit additional information. Upon written request from the Department, Ensyn shall provide information necessary to demonstrate AAQS will not be exceeded, potentially including submission of an ambient air quality impact analysis or an application to amend this air emission license to resolve any deficiencies and ensure compliance with AAQS. Submission of this information is due within 60 days of the Department's written request unless otherwise stated in the Department's letter. [06-096 C.M.R. ch. 115, § 2(O)]

DONE AND DATED IN AUGUSTA, MAINE THIS 12th DAY OF JANUARY, 2023.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: _____ for _____
MELANIE LOYZIM, COMMISSIONER

The term of this license shall be ten (10) years from the signature date above.

[Note: If a renewal application, determined as complete by the Department, is submitted prior to expiration of this license, then pursuant to Title 5 M.R.S. § 10002, all terms and conditions of the license shall remain in effect until the Department takes final action on the license renewal application.]

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: May 16, 2022
Date of application acceptance: May 24, 2022

Date filed with the Board of Environmental Protection:

This Order prepared by Benjamin Goundie, Bureau of Air Quality.

FILED

JAN 12, 2023

State of Maine
Board of Environmental Protection