

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

DEPARTMENT ORDER

Fairchild Semiconductor Corporation d/b/a ON Semiconductor Cumberland County South Portland, Maine A-370-71-AA-A

Departmental Findings of Fact and Order Air Emission License Amendment # 1

FINDINGS OF FACT

After review of the air emission license amendment 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

Fairchild Semiconductor Corporation d/b/a ON Semiconductor (Fairchild) was issued Air Emission License A-370-71-Z-R/A on 11/4/17, for the operation of emission sources associated with the production of micro-circuits on thin silica wafers at its semiconductor manufacturing facility.

Fairchild has requested an amendment to their license in order to replace the VOC Abatement Unit with a like-kind new unit, and install three 2.0 MMBtu natural gas-fired boilers, an emergency generator, and a wet scrubber at the new chemical building.

The equipment addressed in this license amendment is located at 333 Western Avenue, South Portland, Maine.

B. Emission Equipment

The following equipment is addressed in this air emission license amendment:

Equipment	Max. Capacity (MMBtu/hr)	Maximum Firing Rate (scf/hr)	Fuel Type, % sulfur	Date of Manuf.	Date of Install.
Boiler #5	2.0	1,961	natural gas, neg.	2020	2020
Boiler #6	2.0	1,961	natural gas, neg.	2020	2020
Boiler #7	2.0	1,961	natural gas, neg.	2020	2020

Boilers

Departmental Findings of Fact and Order Air Emission License Amendment # 1

Stationary Engines

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Equipment	Max. Input Capacity (MMBtu/hr)	Rated Output Capacity (kW)	Fuel Type, % sulfur	Firing Rate (gal/hr)	Date of Manuf.	Date of Install.
Generator #6	3.98	400	Distillate fuel, 0.0015%	28.4	2020	2020

C. 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.

The modification of a minor source is considered a major or minor modification based on whether or not expected emission increases exceed the "Significant Emission" levels as defined in the Department's *Definitions Regulation*, 06-096 Code of Maine Rules (C.M.R.) ch. 100. The emission increases are determined by subtracting the current licensed annual emissions preceding the modification from the maximum future licensed annual emissions, as follows:

Pollutant	Current License	Future License	Net Change	Significant Emission Lovels
Tonutant				Emission Levels
PM	99.9	99.9	0	100
PM_{10}	99.9	99.9	0	100
SO_2	99.9	99.9	0	100
NO _x	99.9	99.9	0	100
CO	99.9	99.9	0	100
	25 process	25 process		
VOC	equipment;	equipment;	0	50
	15 fuel burning	15 fuel burning		

This modification is determined to be a minor modification and has been processed as such.

D. Facility Classification

With the annual emissions limit on all boilers and generators, the facility is licensed as follows:

- As a synthetic minor source of air emissions, because Fairchild 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.

Emissions of PM, PM_{10} , SO_2 , NO_x , and CO are licensed above 80% of the major source threshold. Therefore, this facility is classified as an "80% Synthetic Minor" for the purpose of determining the minimum required compliance inspection frequency in accordance with Maine's Compliance Monitoring Strategy.

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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. Boilers #5, #6, and #7

Fairchild will operate Boilers #5, #6, and #7 for heat. The boilers are each rated at 2.0 MMBtu/hr and fire natural gas. The boilers will be installed in 2020 and each exhaust through its own stack.

1. BACT Findings

Following is a BACT analysis summary for control of emissions from Boilers #5, #6, and #7.

a. Particulate Matter (PM, PM₁₀)

Fairchild has proposed to burn only low-ash content fuel (natural gas) in the boilers, resulting in minimal particulate matter emissions. Additional add-on pollution controls are not economically feasible.

The Department finds that BACT for PM/PM_{10} emissions from Boilers #5, #6, and #7 is the use of natural gas as fuel and the emission limits listed in the tables below.

b. <u>Sulfur Dioxide (SO₂)</u>

Fairchild has proposed to burn only natural gas. The use of this fuel 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 Boilers #5, #6, and #7 is the use of natural gas as fuel and the emission limits listed in the tables below.

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c. Nitrogen Oxides (NO_x)

Fairchild considered several control strategies for the control of NO_x including Selective Catalytic Reduction (SCR), Selective Non-Catalytic Reduction (SNCR), water/steam injection, flue gas recirculation (FGR), use of oxygen trim systems, and ultra-low NO_x burners.

Both SCR and SNCR are technically feasible control technologies for minimizing NO_x . However, they have a negative environmental impact of emissions of unreacted ammonia. In addition, due to the initial capital cost and the annual operating costs, these systems are typically only considered cost effective for units larger than Boilers #5, #6, and #7.

Water/steam injection and FGR have similar NO_x reduction efficiencies. However, water/steam injection results in reduced boiler efficiency of approximately 5%, and FGR is not available on boilers this small.

The use of ultra-low NO_x burners on Boilers #5, #6, and #7 has been determined to be feasible and has been proposed as part of the BACT strategy.

The Department finds that BACT for NO_x emissions from Boilers #5, #6, and #7 is the use of ultra-low NO_x burners and the emission limits listed in the tables below.

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

Fairchild considered several control strategies for the control of CO and VOC including oxidation catalysts, thermal oxidizers, and use of a modulating burner system.

Oxidation catalysts and thermal oxidizers both have high capital, maintenance, and operational costs considering the size of the boilers in question. These controls were determined to not be economically feasible.

A modulating burner system varies the fuel and air admittance rates into the burner to optimize the air-to-fuel ratio. The use of a modulating burner system has been determined to be feasible and has been selected as part of the BACT strategy for Boilers #5, #6, and #7.

The Department finds that BACT for CO and VOC emissions from Boilers #5, #6, and #7 is the use of a modulating burner system and the emission limits listed in the tables below.

e. Emission Limits

The BACT emission limits for Boilers #5, #6, and #7 were based on the following:

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Natural Gas

PM/PM_{10}	_	0.05 lb/MMBtu based on 06-096 C.M.R. ch. 115, BACT
SO ₂	_	0.6 lb/MMscf based on AP-42 Table 1.4-2 dated 7/98
NO _x	_	Manufacturer's guarantee of 9 ppm
CO	_	84 lb/MMscf based on AP-42 Table 1.4-1 dated 7/98
VOC	_	5.5 lb/MMscf based on AP-42 Table 1.4-2 dated 7/98
Visible Emissions	_	06-096 C.M.R. ch. 115, BACT

The BACT emission limits for Boilers #5, #6, and #7 are the following:

	PM	PM ₁₀	SO ₂	NO _x	CO	VOC
Unit	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
Boiler #5	0.10	0.10		0.03	0.16	0.01
Boiler #6	0.10	0.10		0.03	0.16	0.01
Boiler #7	0.10	0.10		0.03	0.16	0.01

2. Visible Emissions

Visible emissions from Boilers #5, #6, and #7 shall each not exceed 10% opacity on a six-minute block average basis.

3. Periodic Monitoring

Periodic monitoring for Boilers #5, #6, and #7 shall include recordkeeping to document fuel use both on a monthly and 12-month rolling total basis.

4. New Source Performance Standards (NSPS): 40 C.F.R. Part 60, Subpart Dc

Due to their size, Boilers #5, #6, and #7 are not subject to *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units* 40 C.F.R. Part 60, Subpart Dc for units greater than 10 MMBtu/hr manufactured after June 9, 1989. [40 C.F.R. § 60.40c]

5. National Emission Standards for Hazardous Air Pollutants (NESHAP): 40 C.F.R. Part 63, Subpart JJJJJJ [40 C.F.R. § 63.11195]

Boilers #5, #6, and #7 are not subject to the National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources, 40 C.F.R. Part 63, Subpart JJJJJJ due to exclusively firing natural gas.

C. <u>Generator #6</u>

Fairchild will operate Generator #6 as an emergency generator. Generator #6 is a generator set consisting of an engine and an electrical generator. Generator #6 has an engine rated at 3.98 MMBtu/hr, which fires distillate fuel and was manufactured in 2020.

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1. BACT Findings

The BACT emission limits for Generator #6 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 dated 10/96
CO	- 0.95 lb/MMBtu from AP-42 dated 10/96
VOC	- 0.35 lb/MMBtu from AP-42 dated 10/96
Visible Emissions	- 06-096 C.M.R. ch. 115, BACT

The BACT emission limits for Generator #6 are the following:

Unit	Polluta	ollutant lb/MMB				
Generator #6	PM	0.	.12			
	PM	\mathbf{PM}_{10}	SO ₂	NO _x	CO	VOC
Unit	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
Generator #6	0.48	0.48	0.01	17.55	3.78	1.39

Visible emissions from Generator #6 shall not exceed 20% opacity on a six-minute block average basis.

2. 40 C.F.R. Part 60, Subpart IIII

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

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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 or equipment failure;
- 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.

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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
 - 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 RequirementA 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. Fairchild 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

Fairchild shall keep records that include maintenance conducted on the engine and 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 nonemergency purposes, and the reason the engine was in operation during each time. [40 C.F.R. § 60.4214(b)]

D. Replacement of the VOC Abatement Unit

The existing VOC Abatement Unit installed at Fairchild in 1996 is nearing the end of its useful life, and Fairchild has proposed to replace the unit with a like-kind unit. Fairchild has provided documentation from the manufacturer that shows the new unit will have a destruction efficiency at least as effective as the presently licensed unit.

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Fairchild shall continue to adhere to all license conditions regarding the VOC Abatement Unit as denoted in Air Emission License A-370-71-Z-R/A issued on 11/4/14.

E. New Wet Scrubber Unit on the newly constructed Chemical Building

Fairchild is constructing a new storage and distribution building for both acid and alkaline solutions. This unit will operate in parallel with existing building vent wet scrubbers for the collection of chemical vapors released inside the new chemical building.

Fairchild shall continue to adhere to all license conditions regarding the Wet Scrubbers located throughout the facility as denoted in Air Emission License A-370-71-Z-R/A issued on 11/4/14.

F. Annual Emissions

This license amendment will not change the facility's licensed annual emissions. New equipment added in this license shall be accounted for by including them in the annual emissions calculation method as denoted in Air Emission License A-370-71-Z-R/A issued on 11/4/14.

Total Licensed Annual Emissions for the Facility Tons/year

	PM	PM ₁₀	SO ₂	NO _x	CO	VOC
Facility Wide	99.9	99.9	99.9	99.9	99.9	25 process equipment; 15 fuel burning
Total TPY	99.9	99.9	99.9	99.9	99.9	25 process equipment; 15 fuel burning

(used to calculate the annual license fee)

Pollutant	Tons/year
Single HAP	9.9
Total HAP	24.9

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III.AMBIENT AIR QUALITY ANALYSIS

The level of ambient air quality impact modeling required for a minor source is determined by the Department on a case-by case basis. In accordance with 06-096 C.M.R. ch. 115, an ambient air quality impact analysis is not required for a minor source if the total licensed annual emissions of any pollutant released do not exceed the following levels and there are no extenuating circumstances:

Pollutant	Tons/Year
PM10	25
SO_2	50
NO _x	50
СО	250

Fairchild Semiconductor previously submitted an ambient air quality analysis performed as part of amendment A-370-71-B-T/R (June 3, 1997). The analysis demonstrated that emissions from the facility, in conjunction with other sources, will not violate all applicable National Ambient Air Quality Standards (NAAQS). The addition of the proposed equipment addressed in this license amendment will have a small increase in short-term emission rates, but the new emissions will be included in the maximum TPY limits that that were the basis of the 1997 modeling. Therefore, no additional modeling needs to be performed as part of this licensing action.

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 Amendment A-370-71-AA-A subject to the conditions found in Air Emission License A-370-71-Z-R/A and the following conditions.

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

SPECIFIC CONDITIONS

The following are new conditions of Air Emission License A-370-71-Z-R/A.

- (29) **Boilers #5, #6, and #7**
 - A. Boilers #5, #6, and #7 are licensed to fire only natural gas. [06-096 C.M.R. ch. 115, BACT]
 - B. Boilers #5, #6, and #7 shall utilize ultra-low NOx burners and a modulating burner system. [06-096 C.M.R. ch. 115, BACT]

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

Emission Unit	PM (lb/hr)	PM ₁₀ (lb/hr)	NOx (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Boiler #5	0.10	0.10	0.03	0.16	0.01
Boiler #6	0.10	0.10	0.03	0.16	0.01
Boiler #7	0.10	0.10	0.03	0.16	0.01

- D. Visible emissions from the boiler shall not exceed 10% opacity on a six-minute block average basis. [06-096 C.M.R. ch. 115, BACT]
- E. Fairchild shall maintain records of the amounts of fuel combusted in Boilers #5, #6, and #7 on a monthly and 12-month rolling total basis.
 [06-096 C.M.R. ch. 115, BACT]

(30) **Generator #6**

- A. Generator #6 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. Emissions shall not exceed the following:

Unit	Pollutant	lb/MMBtu	Origin and Authority
Generator #6	DM	0.12	06-096 C.M.R. ch. 103,
	PIM	0.12	§ (2)(B)(1)(a)

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

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T I *4	PM (h /h m)	\mathbf{PM}_{10}	SO_2	NO _x	CO	VOC
Unit	(ID/hr)	(ID/hr)	(ID/hr)	(ID/hr)	(ID/hr)	(ID/nr)
Generator #6	0.48	0.48	0.01	17.55	3.78	1.39

D. Visible Emissions

Visible emissions from the emergency generator shall not exceed 20% opacity on a sixminute block average basis. [06-096 C.M.R. ch. 115, BACT]

- E. Generator #6 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]
 - 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, BPT]

Fairchild Semiconductor Corporation d/b/a ON Semiconductor Cumberland County South Portland, Maine A-370-71-AA-A

b. Fairchild shall keep records that include maintenance conducted on the engine and 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 nonemergency purposes, and the reason the engine was in operation during each time. [40 C.F.R. § 60.4214(b)]

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5. Operation and Maintenance

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

done and dated in Augusta, maine this 13^{th} day of OCTOBER, 2020.

DEPARTMENT OF ENVIRONMENTAL PROTECTION BY: for MELANIE LOYZIM, ACTING COMMISSIONER

The term of this amendment shall be concurrent with the term of Air Emission License A-370-71-Z-R/A.

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: <u>9/17/20</u> Date of application acceptance: <u>9/17/20</u>

Date filed with the Board of Environmental Protection:

This Order prepared by Chris Ham, Bureau of Air Quality.

OCT 13, 2020

State of Maine Board of Environmental Protection