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

DEPARTMENT ORDER

| | |
|---|---|
| **Naval Computer and Telecommunications Area Master Station Atlantic Detachment Cutler<br>Washington County<br>Cutler, Maine<br>A-210-77-5-A** | **Departmental<br>Findings of Fact and Order<br>New Source Review<br>NSR #5** |

## 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 (the Department) finds the following facts:

## I. REGISTRATION

### A. Introduction

| | |
|---|---|
| FACILITY | Naval Computer and Telecommunications Area Master Station Atlantic Detachment (NCTAMS LANT DET) |
| LICENSE TYPE | 06-096 C.M.R. ch. 115, Minor Modification |
| NAICS CODES | 9711 National Security (Federal Facility)<br>4911 Electrical Power Generation<br>3443 Oil Storage Tanks |
| NATURE OF BUSINESS | Naval communications, electricity generation, space heating |
| FACILITY LOCATION | Route 191, Cutler, Maine |

### B. NSR License Description

Naval Computer and Telecommunications Area Master Station Atlantic Detachment Cutler (NCTAMS LANT DET, also referred to as the Naval Support Activity (NSA) Cutler, the Cutler facility, or Cutler) has requested a New Source Review (NSR) license to revise previous and incorporate new $NO_x$ Reasonably Available Control Technology (RACT) limits for the Building 103 Power Plant main engines VLF-103-D#2, VLF-103-D#3, VLF-103-D#4, and VLF-103-D#5.

Cutler has also requested NSRs A-210-77-1-A (issued December 29, 2014) and A-210-77-3-A (issued September 20, 2018) be amended to remove the restriction on concurrent operation of boilers VLF-103-B#7 and VLF-103-B#8, correct the hourly CO emission limits for engines VLF-103-D#2, VLF-103-D#3, VLF-103-D#4, VLF-103-D#5,

and VLF-103-D#6, and clarify the limitations on concurrent operation of engines VLF-103-D#2, VLF-103-D#3, VLF-103-D#4, and VLF-103-D#5.

C. Emission Equipment

The following equipment is addressed in this NSR license:

**Fuel Burning Equipment**

| Equipment | Maximum Capacity (MMBtu/hr) | Maximum Firing Rate (gal/hr) | Fuel Type, % sulfur |
|---|---|---|---|
| VLF-103-B#7 | 3.98 | 29.0 | Distillate fuel, (0.0015%) |
| VLF-103-B#8 | 3.98 | 29.0 | Distillate fuel, (0.0015%) |

**Generators/Engines**

| Equipment | Max. Heat Input Capacity (MMBtu/hr) | Output | Fuel Type, % sulfur | Mfr. Date | Install. Date |
|---|---|---|---|---|---|
| VLF-103-D#2 | 32.0 | 3000 kW | Distillate fuel (0.0015%) | 1972 | 1976 |
| VLF-103-D#3 | 32.0 | 3000 kW | Distillate fuel (0.0015%) | 1972 | 1976 |
| VLF-103-D#4 | 32.0 | 3000 kW | Distillate fuel (0.0015%) | 1972 | 1976 |
| VLF-103-D#5 | 32.0 | 3000 kW | Distillate fuel (0.0015%) | 1972 | 1976 |
| VLF-103-D#6 | 8.0 | 750 kW | Distillate fuel (0.0015%) | 1996 | 1997 |

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.

E. Project Description

On December 13, 2017, the Department issued a Notice of Violation (NOV) to the Cutler facility for failure to comply with nitrogen oxides ($NO_x$) Reasonably Available Control Technology (RACT) provisions for main engines VLF-103-D#2, VLF-103-D#3, VLF-103-D#4, and VLF-103-D#5. Specifically, these engines failed to meet the $NO_x$ RACT performance-based emission limit of 3.2 lb/MMBtu. The engines did, however, demonstrate compliance with the hourly $NO_x$ emission limit of 102.4 lb/hr. The Cutler facility has submitted an updated RACT plan, including evaluation of applicable control technologies, a new proposed $NO_x$ emission limit, and supporting air dispersion modeling.

The Cutler facility has also requested the following amendments to NSRs A-210-77-1-A (12/29/2014) and A-210-77-3-A (9/20/2018):

- The removal of Specific Condition (1)B established in NSR license A-210-77-1-A and amended in NSR license A-210-77-3-A restricting the simultaneous operation of boilers VLF-103-B#7 and VLF-103-B#8.

- A correction to the hourly CO emission limits for engines VLF-103-D#2 through VLF-103-D#6 to be consistent with 40 C.F.R. Part 63, Subpart ZZZZ requirements.

- Clarification of Specific Condition (3)D of NSR A-210-77-1-A, as amended in NSR A-210-77-3-A, limiting the concurrent operation of engines VLF-103-D#2 through VLF-103-D#5 to no more than three units at a time for a maximum of 100 hours per year.

F. Application Classification

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

The application for the Cutler Facility does not violate any applicable federal or state requirements and does not reduce monitoring, reporting, testing, or recordkeeping requirements.

The modification of a major source is considered a major or minor modification based on whether or not expected emissions increases exceed the "Significant Emission Increase" levels as given in *Definitions Regulation*, 06-096 Code of Maine Rules (C.M.R.) ch. 100. No increase in emissions is expected to result from the changes presented in this NSR license.

Since emissions increases do not exceed significant emissions increase levels, this NSR license is determined to be a minor modification under *Minor and Major Source Air Emission License Regulations*, 06-096 C.M.R. ch. 115. Cutler has submitted an application to incorporate the requirements of this NSR license into the facility's Part 70 air emission license.

## II. BEST PRACTICAL TREATMENT (BPT) AND REASONABLY AVAILABLE CONTROL TECHNOLOGY (RACT) FOR $NO_X$

### 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 as well as for those sources located in designated non-attainment areas.

BPT for existing emissions equipment means that method which controls or reduces emissions to the lowest possible level considering:

- the existing state of technology;
- the effectiveness of available alternatives for reducing emissions from the source being considered; and
- the economic feasibility for the type of establishment involved.

The following determination satisfies the requirements for both BPT and RACT for $NO_x$.

### B. $NO_x$ RACT

#### 1. Introduction

*Reasonably Available Control Technology for Facilities that Emit Nitrogen Oxides*, 06-096 C.M.R. ch. 138 ($NO_x$ RACT) is applicable to sources that have the potential to

emit quantities of $NO_x$ equal to or greater than 100 tons/year. Air Emission License A-210-70-D-R issued to the facility on June 19, 2012, includes $NO_x$ RACT requirements. These requirements were updated in amendments A-210-70-E-A (issued September 6, 2013) and A-210-70-F-A (issued August 3, 2015).

On December 13, 2017, the Department issued an NOV to the Cutler Facility for failure of engines VLF-103-D#2 through VLF-103-D#5 to meet the $NO_x$ RACT limit of 3.2 lb/MMBtu as demonstrated by emission testing conducted on July 29 and 30, 2013, December 4, 2013, and December 6 and 7, 2016. The Cutler Facility agreed to develop a path to compliance with $NO_x$ RACT by submitting an updated RACT plan to the Department. The plan includes evaluation of applicable control technologies and proposed emission limits. The results are summarized in this NSR license.

2. Control Options Evaluation

   a. Use of Commercial Power

      An effective method of reducing $NO_x$ emissions from engines VLF-103-D#2, VLF-103-D#3, VLF-103-D#4, and VLF-103-D#5 is for the facility to reduce operations of the engines. To this end, the Cutler facility has implemented a project to connect the facility to commercial power. Commercial power connections were completed in October of 2018 and were fully operational in November of 2018. The Cutler facility is currently using commercial power as the primary power source to meet the operational needs of its VLF antenna array. Since the connection to commercial power, the operation of engines VLF-103-D#2, VLF-103-D#3, VLF-103-D#4, and VLF-103-D#5 has been reduced by more than 80%.

      The Cutler facility anticipates that the engines will still need to be operated periodically for exercising, testing and maintenance, equipment upgrades, training, power outages (including anticipation of potential power outages), de-icing conditions, and emergencies. While a significant decrease in engine operations are expected, due to the critical national security nature of the operations at the Cutler facility and the fact that the reliability of the commercial power to meet the operational needs of the VLF antenna array has not been fully evaluated, no reduction to licensed operating limits are being considered at this time.

      The Cutler facility has proposed the installation and use of commercial power as a $NO_x$ RACT strategy for engines VLF-103-D#2, VLF-103-D#3, VLF-103-D#4, and VLF-103-D#5.

b. Ignition Timing Retard

Ignition timing retard controls $NO_x$ emissions by starting the combustion process later in the power stroke when the piston is in a downward motion and the combustion chamber volume is increasing. The increased volume results in lower combustion temperatures and pressures and, therefore, lower $NO_x$ emissions and increased products of incomplete combustion such as carbon monoxide (CO) and volatile organic compounds (VOC). $NO_x$ reductions from ignition timing retard varies by engine, but the expected decrease is 15 to 30% when adjusting non-retarded engines to a retard angle to minimize $NO_x$.

Engines VLF-103-D#2, VLF-103-D#3, VLF-103-D#4, and VLF-103-D#5 currently use ignition timing retard to comply with $NO_x$ RACT. The engines were initially retarded between 1991 and 1993. The Cutler facility conducted an engineering study in March 2019 to optimize the ignition timing retard of engine VLF-103-D#5 while concurrently measuring $NO_x$, CO, and $O_2$. The ignition timing retard settings for the other engines were adjusted based on the study results. All engines are now using a retard angle of 14° to 14.5°. Cutler will update annual facility maintenance requirements to include periodic checking and adjusting of the ignition timing settings for the engines, as required.

The Cutler facility has proposed ignition timing retard as a $NO_x$ RACT strategy for engines VLF-103-D#2, VLF-103-D#3, VLF-103-D#4, and VLF-103-D#5.

c. Selective Catalytic Reduction (SCR)

SCR is an add-on control technology that injects urea or ammonia in the presence of a catalyst to reduce $NO_x$ to nitrogen ($N_2$) and water ($H_2O$). For internal combustion engines, urea is most often used. The reactions take place on the surface of a catalyst which reduces the activation energy of the $NO_x$ decomposition reaction. Technical factors related to this technology include the catalyst reactor design, optimum operating temperature, sulfur content of the fuel, and design of the ammonia/urea injection system.

An SCR system is composed of an ammonia or urea storage tank, ammonia/urea forwarding pumps and controls, an injection grid, a reactor which contains the catalyst, and instrumentation and controls. The injection grid disperses ammonia or urea in the flue gas upstream of the catalyst, and the ammonia/urea and $NO_x$ are reduced on the catalyst reactor. This control technique reduces both thermal and fuel bound $NO_x$.

SCR is a technically feasible control technology for these engines.

The Cutler facility conducted a cost analysis of add-on SCR controls for engines VLF-103-D#2, VLF-103-D#3, VLF-103-D#4, and VLF-103-D#5. The purchase and installation cost of the equipment is estimated to be $4,092,780, and annual operating and maintenance costs are estimated to be $1,285,748. Assuming an 80% reduction in $NO_x$, and taking into account the reduced engine operating time due to the use of commercial power, the cost effectiveness of SCR add-on controls amounts to more than $15,000 per ton of $NO_x$ controlled. This is not considered economically feasible, and is therefore not considered RACT for these engines.

d. Selective Non-Catalytic Reduction (SNCR)

SNCR is another add-on control technology that injects urea or ammonia into the exhaust gas to reduce $NO_x$ to $N_2$ and $H_2O$, but unlike in SCR, a catalyst is not used. For SNCR, the reducing agent is injected into the exhaust gas where the exhaust temperature is between 1,600 °F and 2,100 °F. The high gas temperatures support high chemical reaction rates so that a catalyst is not required. At gas temperatures below 1,600 °F, unreacted ammonia or urea is discharged out of the stack as ammonia slip. At gas temperatures above 2,100 °F, ammonia or urea will react with oxygen to form additional $NO_x$.

SNCR is not identified as a technologically feasible control technology for diesel engines. The flue gas temperature is not high enough to support the necessary reaction. SNCR is not considered RACT for these engines.

3. Emission Limits

The Cutler facility has proposed an increase in the lb/MMBtu $NO_x$ limit for engines VLF-103-D#2, VLF-103-D#3, VLF-103-D#4, and VLF-103-D#5 from 3.2 lb/MMBtu to 4.16 lb/MMBtu, based on compliance testing conducted in 2019. Because the engines are able to meet the current lb/hr $NO_x$ limit, no change is being proposed to these limits. The Department acknowledges that there will no longer be a direct correlation between the lb/hr and lb/MMBtu limits for these engines. No changes to the $NO_x$ lb/MMBtu or lb/hr limits for engine VLF-103-D#6 are being proposed.

The NOx emissions from VLF-103-D#2, VLF-103-D#3, VLF-103-D#4, VLF-103-D#5, and VLF-103-D#6 shall not exceed the following limits:

| Equipment | $NO_x$ lb/MMBtu | $NO_x$ lb/hr |
|---|---|---|
| VLF-103-D#2 | 4.16 | 102.4 |
| VLF-103-D#3 | | |
| VLF-103-D#4 | | |
| VLF-103-D#5 | | |
| VLF-103-D#6 | 3.2 | 25.61 |

C. Amendment to A-210-77-1-A (12/29/2014) and A-210-77-3-A (9/20/2018)

1. Specific Condition (1)B of NSR A-210-77-1-A (12/29/2014), as amended in NSR A-210-77-3-A (9/20/2018) states the following:

   *At any one time, Cutler may operate either Boiler VLF-103-B#7 or VLF-103-B#8 but not both, except during periods when one of the two is being taken off-line and the other is being brought on-line. The previous sentence notwithstanding, both boilers B#7 and B#8 are licensed to operate concurrently if none of the non-emergency generators VLF-103-D#2, VLF-103-D#3, VLF-103-D#4, and VLF-103-D#5 are in operation.*

   *Operational records shall be maintained documenting compliance with this requirement. [A-210-77-1-A (12/29/2014), BACT]*

   Cutler has proposed the removal of this condition in order to simplify facility recordkeeping requirements. An air dispersion modeling analysis submitted with the application and summarized in this document includes operation of one large non-emergency engine (VLF-103-D#2, VLF-103-D#3, VLF-103-D#4, or VLF-103-D#5) with the two boilers operating concurrently to demonstrate compliance with National Ambient Air Quality Standards (NAAQS). The above condition will be removed from the relevant NSR licenses.

2. Cutler has requested a correction to the hourly CO emission limits for engines VLF-103-D#2, VLF-103-D#3, VLF-103-D#4, VLF-103-D#5, and VLF-103-D#6.

   Specific condition (3)B of NSR A-210-77-1-A (12/29/2014), as amended in NSR A-210-77-3-A (9/20/2018), established CO limits for engines VLF-103-D#2, VLF-103-D#3, VLF-103-D#4, and VLF-103-D#5 of 23 ppmvd at 15% $O_2$ or a 70% reduction of uncontrolled emissions, and an hourly emission rate of 19.04 lb/hr. Uncontrolled CO emissions from engines VLF-103-D#2, VLF-103-D#3,

VLF-103-D#4, and VLF-103-D#5 are 27.2 lb/hr. A 70% reduction would equate to 8.16 lb/hr.

Specific condition (1)A of NSR A-210-77-3-A (9/20/2018) established CO limits for VLF-103-D#6 of 23 ppmvd at 15% $O_2$ or a 70% reduction of uncontrolled emissions, and an hourly emission rate of 4.76 lb/hr. Uncontrolled CO emissions from VLF-103-D#6 are 6.8 lb/hr. A 70% reduction would equate to 2.04 lb/hr.

The following are the new CO emission limits for engines VLF-103-D#2, VLF-103-D#3, VLF-103-D#4, VLF-103-D#5, and VLF-103-D#6:

| Unit | Emission Limit | Emission Limit Basis |
|---|---|---|
| VLF-103-D#2 | 70% reduction or 23 ppmvd @ 15% $O_2$ | 40 C.F.R. § 63.6603(a) and Table 2d(3) |
| VLF-103-D#3 | | |
| VLF-103-D#4 | | |
| VLF-103-D#5 | | |
| VLF-103-D#6 | | |
| VLF-103-D#2 | 8.16 lb/hr | 70% of pre-controlled lb/hr limit<br><br>06-096 C.M.R. ch. 115, BPT |
| VLF-103-D#3 | | |
| VLF-103-D#4 | | |
| VLF-103-D#5 | | |
| VLF-103-D#6 | 2.04 lb/hr | 70% of pre-controlled lb/hr limit<br><br>06-096 C.M.R. ch. 115, BPT |

3. Specific condition (3)D of NSR A-210-77-1-A (12/29/2014), as amended in NSR A-210-77-3-A (9/20/2018) states the following:

   *At any time, Cutler shall operate only one of the Units VLF-103-D#2, VLF-103-D#3, VLF-103-D#4, or VLF-103-D#5 but not two or more concurrently, except during periods when one of the units is being brought off-line and another is being brought on-line. Operational records shall be maintained documenting compliance with this requirement.*

   *The above limitation notwithstanding, Cutler may operate more than one of these units concurrently for short periods of time for emergency purposes (i.e. de-icing), testing, maintenance, equipment upgrades, and training; but such concurrent operation shall not exceed 100 hours per year. Cutler shall document*

*the reason for concurrent operation and the total number of hours that two or more units are operating concurrently in this emergency mode and make these records available upon request. [06-096 C.M.R. ch. 115, BPT]*

This condition shall be revised to clarify that Cutler may not operate more than three of the engines VLF-103-D#2, VLF-103-D#3, VLF-103-D#4, and VLF-103-D#5 concurrently. Concurrent operation shall remain limited to no more than 100 hours per year.

D. Incorporation Into the Part 70 Air Emission License

Per *Part 70 Air Emission License Regulations*, 06-096 C.M.R. ch. 140 § 1(C)(8), for a modification at the facility that has undergone NSR requirements or been processed through 06-096 C.M.R. ch. 115, the source must apply for an amendment to their Part 70 license within one year of commencing the proposed operations, as provided in 40 C.F.R. Part 70.5. An application to incorporate the requirements of this NSR license into the Part 70 air emission license has been submitted to the Department.

E. 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. Only licensed equipment is included, i.e., emissions from insignificant activities are excluded. Similarly, unquantifiable fugitive particulate matter emissions are not included. Maximum potential emissions were calculated based on the following assumptions:

- Firing 254,040 gal/yr distillate fuel in boilers VLF-103-B#7 and VLF-103-B#8 (combined);
- Firing 2,504,221 gal/yr distillate fuel in engines HF-401-D#5, VLF-103-D#2, VLF-103-D#3, VLF-103-D#4, VLF-103-D#5, and VLF-103-D#6 (combined);
- 100 hours/year of operation for each emergency engine (non-emergency operation hours)

Please note, this information provides the basis for fee calculation only and should not be construed to 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 | $PM_{10}$ | $SO_2$ | $NO_x$ | CO | VOC |
|---|---|---|---|---|---|---|
| VLF-103-B#7 & #8 | 2.1 | 2.1 | 0.1 | 2.6 | 0.7 | 0.1 |
| VLF-100-B#15 | 0.2 | 0.2 | 5.7 | 1.7 | 0.4 | 0.03 |
| Non-Emergency Engines | 14.8 | 14.8 | 0.3 | 549.0 | 43.8 | 17.2 |
| Emergency Engines | 0.1 | 0.1 | -- | 0.4 | 0.1 | 0.1 |
| **Total TPY** | **17.2** | **17.2** | **6.1** | **553.7** | **45.0** | **17.5** |

| Pollutant | Tons/year |
|---|---|
| Single HAP | 9.9 |
| Total HAP | 24.9 |

## III. AMBIENT AIR QUALITY ANALYSIS

A. A refined modeling analysis was performed to show that emissions from Cutler 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.

Since the current licensing action for Cutler is not characterized as a major new source or major modification, it has been determined by the Maine Department of Environmental Protection, Bureau of Air Quality (MEDEP-BAQ) that an assessment of increment and Class I Air Quality Related Values (AQRVs) are not required.

B. Model Inputs

The AERMOD-PRIME refined model was used to address standards in all areas. The modeling analysis accounted for the potential of building wake and cavity effects on emissions from all modeled stacks that are below their calculated formula GEP stack heights.

All modeling was performed in accordance with all applicable requirements of the MEDEP-BAQ and the EPA.

A valid 5-year hourly off-site meteorological database was used in the AERMOD refined modeling analysis. Wind data was collected at heights of 10 and 76 meters at the Domtar (Woodland) meteorological monitoring site during the five-year period July 1, 1991, to June 30, 1996. The following parameters and their associated heights were as follows:

**Table III-1: Meteorological Parameters and Collection Heights**

| Parameter | Sensor Height(s) |
|---|---|
| Wind Speed | 10 meters, 76 meters |
| Wind Direction | 10 meters, 76 meters |
| Standard Deviation of Wind Direction (Sigma A) | 10 meters, 76 meters |
| Temperature | 10 meters, 76 meters |

Each year of meteorological data met the 90% data recovery requirement, both singularly and jointly. Missing data from the primary site were substituted with representative data, interpolated, or coded as missing, per US EPA guidance.

In addition, hourly Gray National Weather Service data, from the same time period, were used to supplement the primary surface dataset for the required variables (cloud cover and ceiling height) that were not explicitly collected at the Domtar meteorological monitoring site. Concurrent upper-air data from the Gray National Weather Service site were also used in the analysis. Missing cloud cover and/or upper-air data values were interpolated or coded as missing, per US EPA guidance.

All necessary representative micrometeorological surface variables for inclusion into AERMET (surface roughness, Bowen ratio and albedo) were calculated using AERSURFACE from procedures recommended by US EPA.

Point-source parameters, used in the modeling for Cutler are listed in Table III-2.

**Table III-2: Point Source Stack Parameters**

| Facility/Stack | Stack Base Elevation (m) | Stack Height (m) | GEP Stack Height (m) | Stack Diameter (m) | UTM Easting NAD83 (m) | UTM Northing NAD83 (m) |
|---|---|---|---|---|---|---|
| Diesel – VLF103D2 | 10.97 | 15.11 | 35.99 | 0.69 | 635,308 | 4,944,613 |
| Diesel – VLF103D3 | 10.97 | 15.11 | 34.36 | 0.69 | 653,312 | 4,944,608 |
| Diesel – VLF103D4 | 10.97 | 15.11 | 35.16 | 0.69 | 635,316 | 4,944,602 |
| Diesel – VLF103D5 | 10.97 | 15.11 | 35.80 | 0.69 | 635,320 | 4,944,597 |
| Boiler – VLF103B7 | 10.97 | 16.15 | 35.70 | 0.46 | 635,335 | 4,944,590 |
| Boiler – VLF103B8 | 10.97 | 16.15 | 35.70 | 0.46 | 635,335 | 4,944,590 |

Emission parameters for NAAQS modeling is listed in Table III-3.

**Table III-3: Stack Emission Parameters**

| Facility/Stack | Averaging Periods | $SO_2$ (g/s) | $PM_{10}$ (g/s) | $PM_{2.5}$ (g/s) | $NO_2$ (g/s) | CO (g/s) | Stack Temp (K) | Stack Velocity (m/s) |
|---|---|---|---|---|---|---|---|---|
| Diesel – VLF103D2 | All | 0.01 | 0.32 | 0.32 | 14.18 | 1.03 | 628.00 | 23.29 |
| Diesel – VLF103D3 | All | 0.01 | 0.32 | 0.32 | 14.18 | 1.03 | 628.00 | 23.29 |
| Diesel – VLF103D4 | All | 0.01 | 0.32 | 0.32 | 14.18 | 1.03 | 628.00 | 23.29 |
| Diesel – VLF103D5 | All | 0.01 | 0.32 | 0.32 | 14.18 | 1.03 | 628.00 | 23.29 |
| Boiler – VLF103B7 | All | 0.01 | 0.06 | 0.06 | 0.07 | 0.02 | 450.00 | 4.24 |
| Boiler – VLF103B8 | All | 0.01 | 0.06 | 0.06 | 0.07 | 0.02 | 450.00 | 4.24 |

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

- $NO_x$ emissions were assumed to convert to $NO_2$ using USEPA's Tier II Ambient Ratio Method (ARM2);

- all particulate emissions were conservatively assumed to convert to $PM_{10}$

C. Modeling Impacts

Predicted impacts on ambient air quality were modeled for $SO_2$, $PM_{10}$, $PM_{2.5}$, $NO_2$, and CO. Each of the individual diesel engines were combined with boilers VLF-103-B#7 and VLF-103-B#8 to compare predicted concentrations, combined with MEDEP background air quality data, against MAAQS/NAAQS standards for applicable averaging periods.

MEDEP examined other area sources whose impacts would be significant in or near Cutler's significant impact area. Due to the applicant's location, extent of the significant impact area, and other nearby source emissions, MEDEP has determined that no additional sources would be considered for combined source modeling.

Background concentrations, listed in Table III-4, are derived from representative rural background data for use in the Eastern Maine Region.

**Table III-4: Background Concentrations**

| Pollutant | Averaging Period | Background Concentration ($\mu g/m^3$) | Date |
|---|---|---|---|
| $SO_2$ | 1-hour | 10 | 2009-2011[1] |
| | 3-hour | 18 | |
| $PM_{10}$ | 24-hour | 42 | 1994[2] |
| | Annual | 10 | |
| $PM_{2.5}$ | 24-hour | 17 | 2008-2010[3] |
| | Annual | 5 | |
| $NO_2$ | 1-hour | 43 | 2009-2012[4] |
| | Annual | 4 | 2010-2012[4] |
| CO | 1-hour | 365 | 2011-2012 |
| | 8-hour | 322 | |

[1] MacFarland Hill - Acadia National Park
[2] Background Site - Baileyville
[3] Greenville Site - Greenville
[4] MicMac Site - Presque Isle

The maximum modeled impacts, including added background concentrations, are shown in Table III-5.

**TABLE III-5: Maximum Predicted Impacts with Background**

| Pollutant | Averaging Period | Max Impact ($\mu g/m^3$) | Receptor UTM E (m) | Receptor UTM N (m) | Receptor Elevation (m) | Back-Ground ($\mu g/m^3$) | Max Total Impact ($\mu g/m^3$) | NAAQS ($\mu g/m^3$) |
|---|---|---|---|---|---|---|---|---|
| $SO_2$ | 1-hour | 0.19 | 635,083 | 4,944,709 | 0.00 | 10 | 10.19 | 196 |
| | 3-hour | 0.20 | 635,023 | 4,944,701 | 0.00 | 18 | 18.20 | 1,300 |
| $PM_{10}$ | 24-hour | 6.91 | 635,083 | 4,944,709 | 0.00 | 42 | 48.91 | 150 |
| $PM_{2.5}$ | 24-hour | 4.60 | 635,083 | 4,944,709 | 0.00 | 17 | 21.60 | 35 |
| | Annual | 0.43 | 635,083 | 4,944,709 | 0.00 | 5 | 5.43 | 12 |
| $NO_2$ | 1-hour | 144.04 | 635,083 | 4,944,709 | 0.00 | 43 | 187.04 | 188 |
| | Annual | 6.54 | 635,083 | 4,944,709 | 0.00 | 4 | 10.54 | 100 |
| CO | 1-hour | 37.71 | 635,083 | 4,944,709 | 0.00 | 365 | 402.71 | 40,000 |
| | 8-hour | 19.15 | 635,069 | 4,944,661 | 0.00 | 322 | 341.15 | 10,000 |

D. Summary

In summary, it has been demonstrated that the Cutler facility, when operating in accordance with the modeled scenarios, will not cause or contribute to a violation of any NAAQS for $SO_2$, $PM_{10}$, $PM_{2.5}$, $NO_2$, or CO.

## 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,
- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

The Department hereby grants New Source Review License Amendment A-210-77-5-A pursuant to the preconstruction licensing requirements of 06-096 C.M.R. ch. 115 and subject to the standard and specific conditions below.

Severability. 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

**Specific Condition (1)B of NSR A-210-77-1-A (12/29/2014), as amended in NSR A-210-77-3-A (9/20/2018) is hereby removed.**

**The following shall replace Specific Condition (1)A of NSR A-210-77-3-A (9/20/2018):**

(1) **VLF-103-D#6 Emission Limits and Fuel Use Requirements**

A. CO emission limits from VLF-103-D#6 shall not exceed the following:

| Unit | Emission Limit | Origin and Authority |
|---|---|---|
| VLF-103-D#6 | 70% reduction<br>or<br>23 ppmvd @ 15% $O_2$ | 40 C.F.R. § 63.6603(a) and Table 2d(3) |
| | 2.04 lb/hr | 06-096 C.M.R. ch. 115, BPT |

**The following shall replace Specific Condition (3)B of NSR A-210-77-1-A (12/29/2014), as amended in NSR A-210-77-3-A (9/20/2018):**

(3) **Non-Emergency Engines VLF-103-D#2, VLF-103-D#3, VLF-103-D#4, and VLF-103-D#5**

B. Emissions from each unit VLF-103-D#2, VLF-103-D#3, VLF-103-D#4, and VLF-103-D#5 shall not exceed the following limits:

| Pollutant | lb/MMBtu | Origin and Authority | Enforceability |
|---|---|---|---|
| PM | 0.08 | 06-096 CMR 115, BPT | Federally Enforceable |

| Pollutant | Emission Limit | Emission Limit Basis |
|---|---|---|
| CO | 70% reduction<br>or<br>23 ppmvd @ 15% $O_2$ | 40 C.F.R. § 63.6603(a) and Table 2d(3) |

| Pollutant | lb/hour | Origin and Authority |
|---|---|---|
| PM | 2.56 | 06-096 CMR 115, BPT |
| $PM_{10}$ | 2.56 | |
| $PM_{2.5}$ | 2.56 | |
| $SO_2$ | 0.05 | |
| $NO_x$ | 102.4 | A-210-70-B-A (3/18/2004), BACT/BPT |
| CO | 8.16 | 06-096 CMR 115, BPT |
| VOC | 3.2 | A-210-70-B-A (3/18/2004) and<br>A-210-70-D-R (6/19/2012), BACT/BPT |

**The following shall replace Specific Condition (3)D of NSR A-210-77-1-A (12/29/2014), as amended in NSR A-210-77-3-A (9/20/2018):**

(3) **Non-Emergency Engines VLF-103-D#2, VLF-103-D#3, VLF-103-D#4, and VLF-103-D#5**

D. At any one time, Cutler shall operate only one of the Units VLF-103-D#2, VLF-103-D#3, VLF-103-D#4, or VLF-103-D#5 but not two or more concurrently, except during periods when one of the units is being brought off-line and another is being brought on-line. Operational records shall be maintained documenting compliance with this requirement.

The above limitation notwithstanding, Cutler may operate up to three of these units concurrently for short periods of time for special circumstances such as de-icing, testing, maintenance, equipment upgrades, and training, but such concurrent operation

shall not exceed 100 hours per year. Cutler shall document the reason for concurrent operation and the total number of hours that two or three units are operating concurrently and make these records available upon request.
[06-096 C.M.R. ch. 115, BPT]

**The following new conditions shall apply:**

(1) **$NO_x$ RACT Requirements**

A. The NOx emissions from VLF-103-D#2, VLF-103-D#3, VLF-103-D#4, VLF-103-D#5, and VLF-103-D#6 shall not exceed the following limits [06-096 C.M.R. ch. 115, BPT and 06-096 C.M.R. ch. 138, $NO_x$ RACT]:

| Equipment | $NO_x$ lb/MMBtu | $NO_x$ lb/hr |
|---|---|---|
| VLF-103-D#2 | 4.16 | 102.4 |
| VLF-103-D#3 | | |
| VLF-103-D#4 | | |
| VLF-103-D#5 | | |
| VLF-103-D#6 | 3.2 | 25.61 |

B. Combined $NO_x$ emissions from VLF-103-D#2, VLF-103-D#3, VLF-103-D#4, and VLF-103-D#5 shall not exceed 549 tons per year on a 12-month rolling total basis.
[06-096 C.M.R. ch. 115, BPT and 06-096 C.M.R. ch. 138, $NO_x$ RACT]

C. When practicable, Cutler shall minimize use of engines VLF-103-D#2, VLF-103-D#3, VLF-103-D#4, and VLF-103-D#5 by the use of commercial power as the primary source of power for the facility.
[06-096 C.M.R. ch. 115, BPT and 06-096 C.M.R. ch. 138, $NO_x$ RACT]

D. Cutler shall maintain ignition timing retard between 14° and 14.5° to minimize $NO_x$ emissions on units VLF-103-D#2, VLF-103-D#3, VLF-103-D#4, VLF-103-D#5. Cutler shall check the ignition timing retard annually and adjust as required.
[A-210-71-F-A (7/25/1995), 06-096 C.M.R. ch. 138, $NO_x$ RACT]

E. Monitoring Requirements

1. Cutler shall continuously monitor and record the following engine operational parameters to ensure optimal engine operation and minimized $NO_x$ emissions. [06-096 C.M.R. ch. 115, BPT and 06-096 C.M.R. ch. 138, $NO_x$ RACT]

| Parameter | Indicator Range | Monitoring Method | Frequency | |
|---|---|---|---|---|
| | | | Monitor | Record |
| *VLF-103-D#2, D#3, D#4, and D#5* | | | | |
| Turbo Charger Exhaust Inlet Temperature, ºF | 1100 ºF (engine hot)<br>1200 ºF (max pre-turbo) | Temperature probe | Continuously | Twice per 8-hour shift when the engine is operating |
| Oil Outlet (engine) Temperature, ºF | 160 – 170 ºF<br>180 ºF alarm | | | |
| *VLF-103-D#6* | | | | |
| Coolant Temperature | 115 – 180 ºF | Temperature probe | Continuously | Twice per 8-hour shift when the engine is operating |
| Coolant Level | Manufacturer's high/low indicators | | | |

2. For any shift, for each of the above engines which is not operating, Cutler shall document that the engine was not in operation; no recorded temperatures are required.

3. In the event that one or more of the required sensors specified above fails, Cutler shall replace the failed sensor within a reasonable timeframe for sensor replacement but not to exceed 21 days and shall continue to monitor and record other engine performance parameters in the interim. Documentation of the time of detection of the sensor failure and the time of sensor replacement shall fulfill the monitoring requirements for that specific unit for up to a 21-day replacement time period.

   The facility may exceed the 21-day replacement time period and remain in compliance with this license condition by taking the engine out of service. In the rare case that the engine cannot be taken down because of lack of back-up engine to fulfill functional requirements of the facility, Cutler shall notify the Department, shall document the reasons for such continued operation, and shall replace the failed sensor(s) as expeditiously as possible.

DONE AND DATED IN AUGUSTA, MAINE THIS 18th DAY OF MAY, 2020.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: _____ for ____
GERALD D. REID, COMMISSIONER

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: December 23, 2019
Date of application acceptance: January 6, 2020

Date filed with the Board of Environmental Protection:

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

**FILED**

MAY 18, 2020

**State of Maine**
**Board of Environmental Protection**