JANET T. MILLS
GOVERNOR

GERALD D. REID
COMMISSIONER

MEMORANDUM

To: File

From: Kevin J. Ostrowski, Senior Meteorologist, Maine DEP

Date: March 13, 2020

Re: Nordic Aquafarms, Inc., Belfast and Northport

Chapter 115 Minor Source Air Emission License Application # A-1146-71-A-N

Background

Nordic Aquafarms, Inc. (Nordic) applied to the Maine Department of Environmental Protection (DEP or Department) for Site Location of Development Act (Site Law), Natural Resources Protection Act (NRPA), Maine Pollutant Discharge Elimination System (MEPDES)/Waste Discharge License (WDL), and Chapter 115 Minor Source Air Emission licenses to construct and operate a Recirculating Aquaculture System (RAS) facility in Belfast and Northport, Maine for the rearing and processing of Atlantic salmon. DEP accepted Nordic's applications as complete for processing on June 13, 2019, and the Board of Environmental Protection (Board) assumed licensing jurisdiction over the applications and voted to hold a hearing on the applications at its June 20, 2019 meeting.

Nordic's proposed project would be located on an approximately 54-acre site in Belfast, with pipelines extending into neighboring Northport. The proposed project would raise and process up to approximately 33,000 metric tons per year of Atlantic salmon. As part of its proposed project, Nordic has applied for a Chapter 115 Minor Source Air Emission License for the installation of eight distillate fuel-fired generators, the specifications of which are listed below. Following review of comments submitted by Intervenor Upstream Watch/Northport Village Corporation, DEP staff recommended, and the Board voted on November 7, 2019, to include the air emissions application among the issues to be examined at the hearing. Additionally, although emissions as quantified by Nordic would not normally require an air dispersion modeling analysis pursuant to Chapter 115 § 7 of the DEP's rules, staff decided to conduct dispersion modeling to estimate ambient air concentrations from the operation of the proposed stationary fuel-burning equipment as part of its evaluation of Nordic's license application and provide that information to the Board and interested parties.

In December 2019, air dispersion modeling was conducted by the Department using data already on file with the Department as well as additional data provided by Ransom Engineering in an email to the Department on November 19, 2019. The results of this modeling were made available to all parties involved in these proceedings.

During the public hearing held on the proposed Nordic project in Belfast on February 11-14, 2020, Department staff determined that some of the modeling inputs and parameters used in the December 2019 analysis were inconsistent with information provided during the examination of witnesses.

As a result, the Department deemed it appropriate to conduct additional dispersion modeling to incorporate the updated modeling inputs and parameters, and the Presiding Officer ordered that the hearing record would remain open to allow for the additional modeling. Specifically, the Department updated the following inputs and parameters as a part of the most recent dispersion modeling:

- building information incorporating the penthouse structures atop Building 1 and Building 2;
- the proposed fence line on the property which will preclude public access; and
- stack exhaust temperatures based upon engine manufacturer-provided data for a Caterpillar model 3516C 2050ekW continuous-service generator set.

This summary and all modeling data (inputs, outputs and related files) therefore updates and replaces all previously conducted DEP modeling for this project and will be used by staff in its analysis of the proposed project.

The updated inputs and results of staff's dispersion modeling are set forth below.

<u>1.0 INTRODUCTION</u>

The dispersion modeling analysis was performed to assist the DEP in determining whether emissions from the operation of Nordic's fuel-burning equipment would 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 increment standards for SO_2, PM_{10}, $PM_{2.5}$ or NO_2.

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

The following is a summary of the assumptions, methodologies and results of the analysis:

2.0 MODEL AND OPTION SELECTION

The AERMOD refined dispersion model with its associated pre-processors was used to predict ambient air concentrations in the modeling domain surrounding the proposed Nordic facility.

The following versions were used:

- AERMOD (version 19191)
- AERMET (version 19191)
- AERMAP (version 18081)
- AERSURFACE (version 13016)

The AERMOD analysis accounted for the potential of building wake and cavity effects on emissions from all modeled stacks.

Due to the terrain variations over the modeling domain, the ‘elevated terrain’ setting was chosen.

Since the proposed Nordic facility is not located near any significant population center, the ‘rural’ dispersion option was chosen.

2.1 PHYSICAL STACK AND EMISSIONS DATA

All AERMOD data inputs for Nordic were developed by DEP-BAQ from information derived from Nordic’s license applications and from Nordic’s responses to subsequent requests for information by DEP staff, including data submitted by Elizabeth Ransom to Jane Gilbert (DEP-BAQ) via e-mail dated November 19, 2019. Engine-related data used in the modeling demonstration (emissions, flows and exit temperatures) for the proposed Caterpillar model 3516C 2050ekW continuous-service generator set were derived and verified from data sheets and information provided by the manufacturer to DEP staff in February and March 2020. These data sheets can be found in Appendix A of this document.

Nordic’s air license application states: “Nordic Aquafarms is planning to install eight 2-MegaWatt (MW) diesel engine sets. The power plant will be designed to generate 14 MWs of electricity using seven of the eight engines. The eighth engine will be designed as a back-up.” Therefore, the AERMOD analysis was set up to estimate impacts associated with the simultaneous operation of seven engines.

The seven engines were conservatively modeled at their maximum design heat input rate for 8,760 hours per year.

AERMOD point-source parameters for Nordic can be found in Tables 1 & 2:

TABLE 1: PHYSICAL STACK DATA

Stacks	Stack Base Elevation (m)	Stack Height (m)	GEP Stack Height (m)	Stack Diameter (m)	UTM Easting NAD83 (m)	UTM Northing NAD83 (m)
Engine Stack 1	18.28	20.57	34.29	0.41	500542	4915990
Engine Stack 2	18.28	20.57	34.29	0.41	500541	4915990
Engine Stack 3	18.28	20.57	34.29	0.41	500545	4915990
Engine Stack 4	18.28	20.57	34.29	0.41	500545	4915991
Engine Stack 5	18.28	20.57	34.29	0.41	500548	4915992
Engine Stack 6	18.28	20.57	34.29	0.41	500548	4915993
Engine Stack 7	18.28	20.57	34.29	0.41	500551	4915993
Engine Stack 8	18.28	20.57	34.29	0.41	500551	4915994

TABLE 2: STACK EMISSION DATA

Stacks	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)
Engine Stacks 1 - 8	All	0.004	0.038	0.038	0.53	2.03	752.04	60.64

2.3 MODELING DOMAIN AND RECEPTOR GRID

As illustrated in Figures 1 and 2, a two-tiered nested 10 x 10-kilometer Cartesian receptor grid was utilized in the AERMOD analysis. The receptor grid contained a total of approximately 8,000 receptors and was centered near the location of Nordic's proposed stacks, comprised of the following receptor spacings:

- 20-meter spacing out to 750 meters
- 200-meter spacing out to 5000 metes

The previous December 2019 analysis incorrectly assumed that Nordic was proposing to construct a fence at their property boundary. At the February 13, 2020 Board hearing, Nordic representatives clarified that a fence would only be constructed in the immediate area of Buildings 1 and 2, as shown in Figure 3. For this analysis, all receptors within

Nordic's proposed fence line or those receptors that fell on Nordic buildings were removed from the analysis as they are not considered ambient air.

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FIGURE 1: EXTENT OF 200 METER RECEPTOR GRID

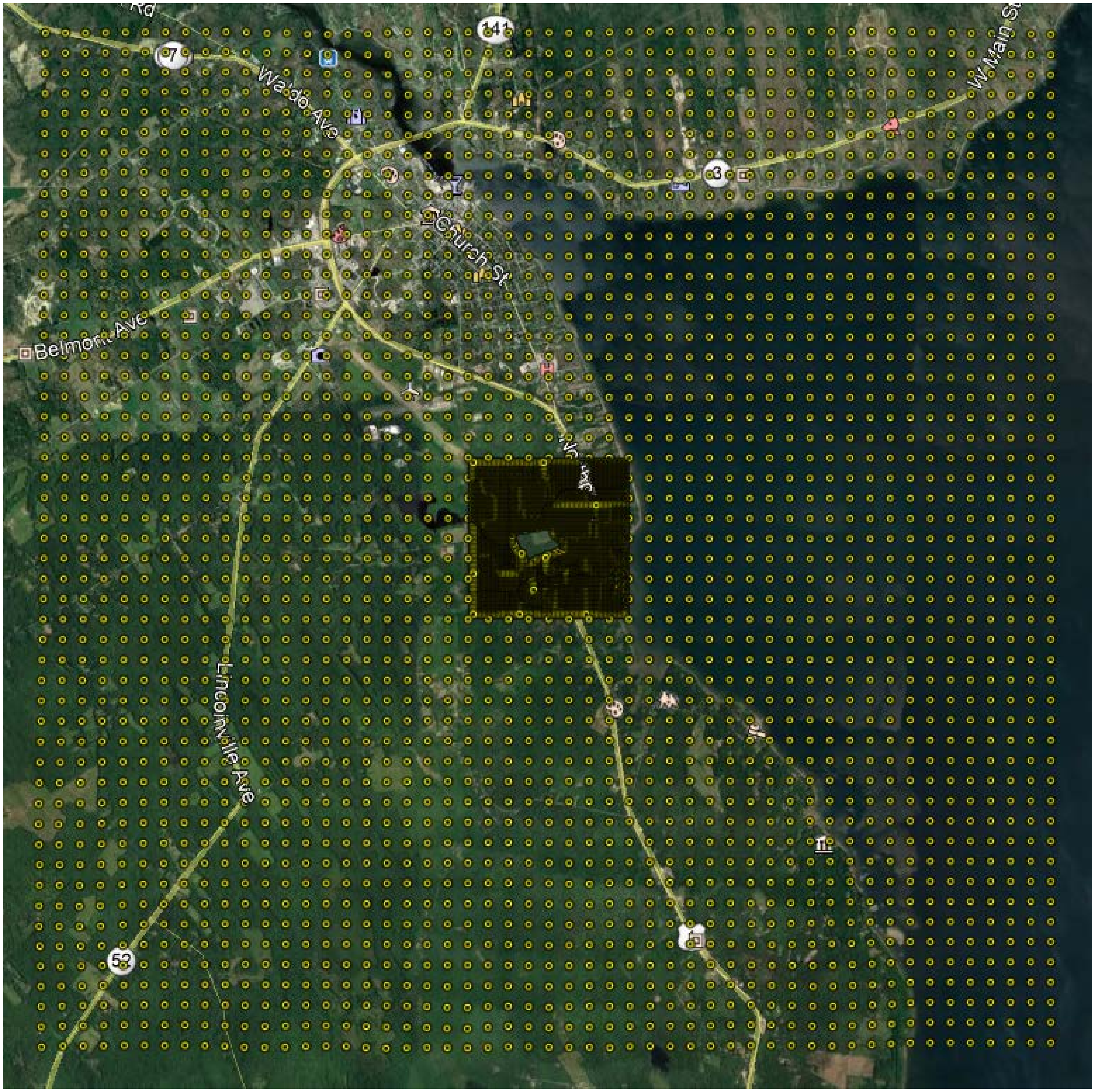

FIGURE 2: EXTENT OF 20 METER RECEPTOR GRID

Note: Blue line indicates property boundary, red line indicates fence-line boundary.

2.4 TERRAIN DATA

Receptor elevations and corresponding receptor height scales (h_c) were generated by the AERMAP terrain pre-processor using terrain data acquired from the United States Geological Survey's (USGS) National Elevation Dataset (NED).

2.5 METEOROLOGICAL DATA

A valid five-year hourly meteorological database was used in the AERMOD modeling analysis. The monitored parameters and their associated heights, as found in Table 3, were collected at the Verso Bucksport meteorological multi-level monitoring site during the five-year period January 1, 1988 to December 31, 1992.

TABLE 3: METEOROLOGICAL DATA PARAMETERS

Parameter	Sensor Heights
Wind Speed	10 & 100 meters
Wind Direction	10 & 100 meters
Standard Deviation of Horizontal Wind Direction (Sigma Θ)	10 & 100 meters
Standard Deviation of Vertical Wind Direction (Sigma W)	10 & 100 meters
Temperature	10 & 100 meters

Surface data collected at the Bangor National Weather Service (NWS) site were substituted for any missing data in the primary surface dataset. All other missing data were interpolated or coded as missing, per USEPA guidance. In addition, hourly Bangor NWS data, from the same time period, were also used to supplement the primary surface dataset for the required variables that were not explicitly collected at the Verso Bucksport monitoring site.

The surface data was combined with concurrent hourly cloud cover and upper-air data obtained from the Portland NWS. Missing cloud cover and/or upper-air data values were interpolated or coded as missing, per USEPA guidance.

Both the surface and upper-air meteorological data were concurrently processed using the AERMET meteorological pre-processor.

AERMET also requires that site-specific surface characteristics around the meteorological and application sites be evaluated. Accordingly, the site surface characteristics values for albedo (r), surface roughness (z_o) and Bowen Ratio (B_o) were calculated using USEPA's AERSURFACE program for each of the twelve 30-degree sectors.

Per USEPA guidance, surface roughness values were calculated within a one-kilometer radius of the monitoring site, while values of albedo and Bowen ratio were developed over a 10 x 10 kilometer region, centered over the monitoring site.

The seasonal categories for AERSURFACE were assigned in accordance with DEP modeling guidance.

2.6 BUILDING RELATED DATA

Buildings at the proposed Nordic facility, as illustrated in Figure 3, were input into USEPA's Building Profile Input Program with Plume Rise Model Enhancement (BPIP-PRIME) to determine any downwash effects from these structures. The dimensional building data was developed and input into BPIP-PRIME from plot plans and other site drawings on file at DEP-BAQ. The building data for this analysis was updated to include six penthouse structures (denoted in light purple) on top of Buildings 1 and 2, the dimensions of which were not addressed by the previous modeling analysis.

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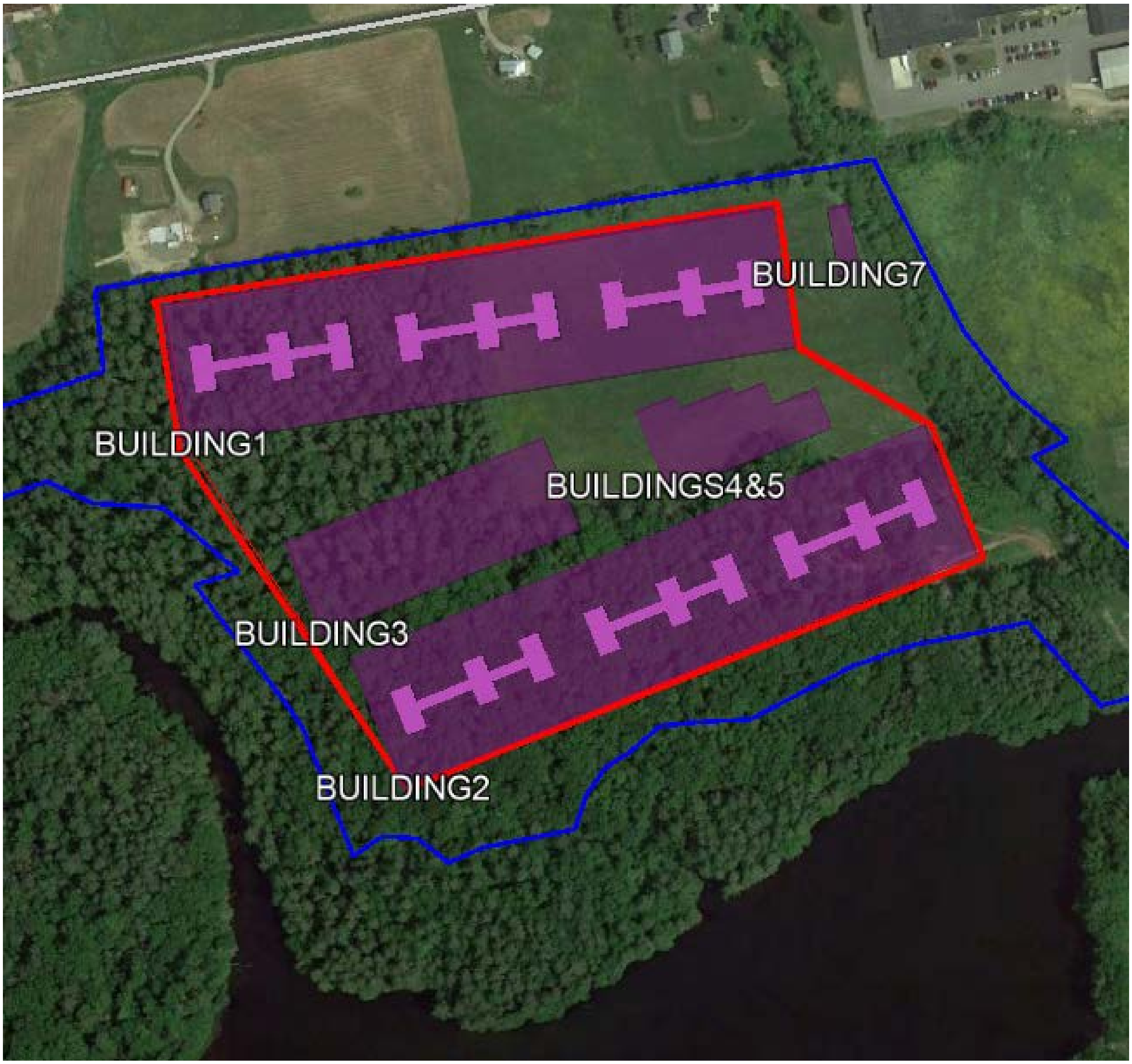
FIGURE 3: NORDIC BUILDINGS



2.7 POLLUTANT CONVERSION METHODS / OTHER ASSUMPTIONS

For the purpose of determining maximum predicted NO_2 and $PM_{10}/PM_{2.5}$ 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) minimum and maximum ratios of 0.5 and 0.9, respectively;

- $PM_{2.5}$ emissions were conservatively modeled as being equivalent to PM_{10} emissions.

2.8 AMBIENT BACKGROUND CONCENTRATIONS

Background concentrations, as found in Table 4, used in the analysis were derived from representative rural background data for use in the Midcoast Maine region.

TABLE 4: AMBIENT BACKGROUND CONCENTRATIONS

Pollutant	Averaging Period	Background Concentration (µg/m^3)	Monitoring Site, Year(s)
SO_2	1-hour	15	Kennebec County, 2016-2018
	3-hour	2	Acadia National Park, 2018
$PM_{10}/PM_{2.5}$	24-hour	15	Kennebec County, 2016-2018
	Annual	6	
NO_2	1-hour	39	Presque Isle, 2016/2017
	Annual	4	
CO	1-hour	460	Hancock County, 2018
	8-hour	460	

3.0 MAXIMUM PREDICTED IMPACTS

The maximum predicted AERMOD impacts, which were explicitly normalized to the form of their respective NAAQS, were added with the conservative rural background values to obtain a final maximum concentration to compare against the NAAQS, as shown in Table 5.

TABLE 5: MAXIMUM PREDICTED IMPACTS (NAAQS COMPARISON)

Pollutant	Averaging Period	Max Impact ($\mu g/m^3$)	Receptor UTM E (m)	Receptor UTM N (m)	Receptor Elevation (m)	Back-Ground ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
SO_2	1-hour	1.59	500550	4915830	15.55	15	16.59	196
	3-hour	1.33	500550	4915830	15.55	2	3.33	1,300
PM_{10}	24-hour	4.27	500550	4915850	14.24	15	19.27	150
	Annual	0.60	500630	4915850	15.61	6	6.60	50
$PM_{2.5}$	24-hour	4.27	500550	4915850	14.24	15	19.27	35
	Annual	0.60	500630	4915850	15.61	6	6.60	12
NO_2	1-hour	120.62	500550	4915830	15.55	39	159.62	188
	Annual	7.36	500630	4915870	15.61	4	11.36	100
CO	1-hour	963.42	500550	4915850	14.24	460	1,423.42	40,000
	8-hour	512.53	500550	4915850	14.24	460	972.53	10,000

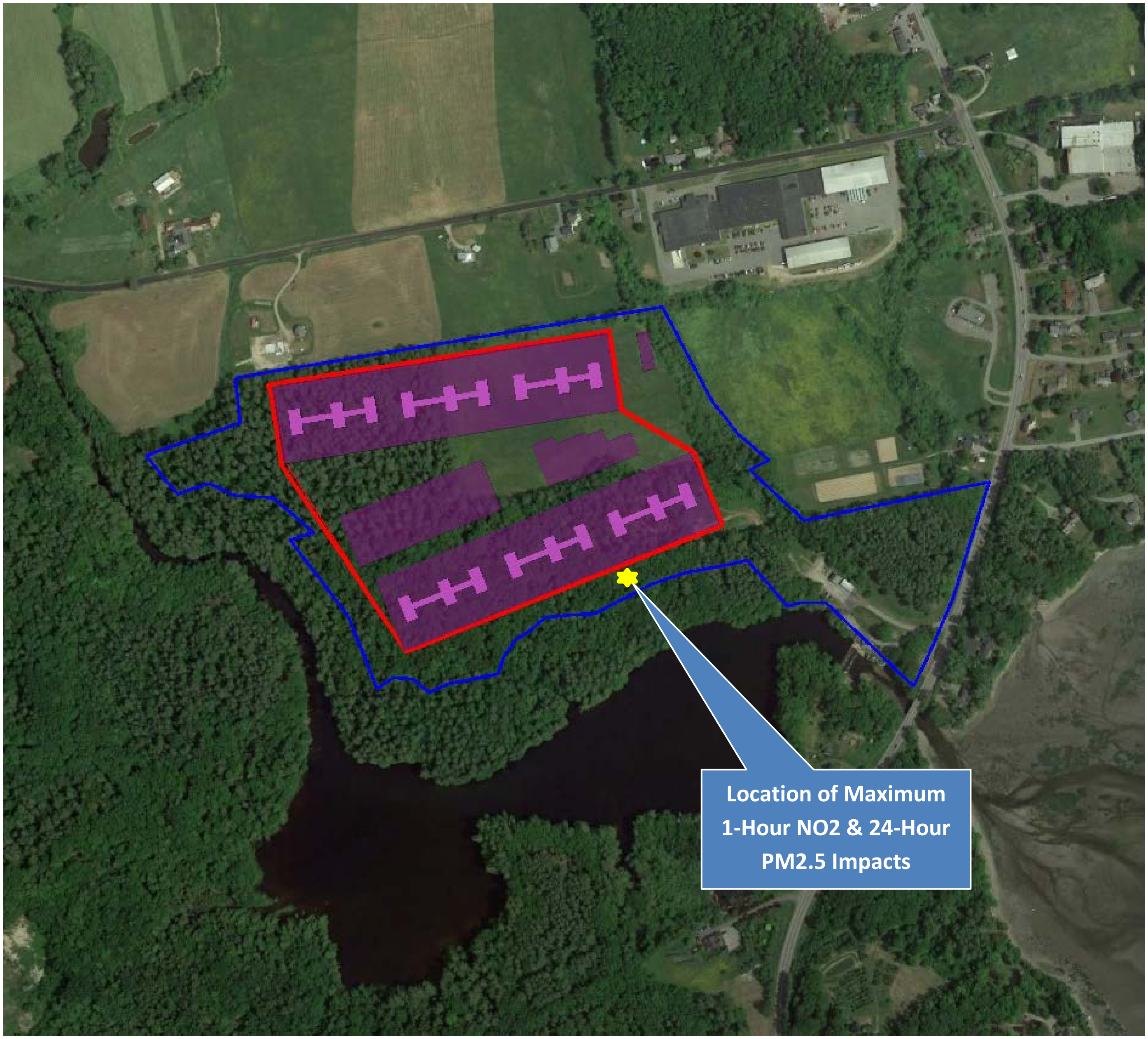
The maximum predicted AERMOD increment impacts, which were explicitly normalized to the form of their respective Class II increment standard, are shown in Table 6.

TABLE 6: MAXIMUM PREDICTED CLASS II IMPACTS (INCREMENT COMPARISON)

Pollutant	Averaging Period	Max Impact ($\mu g/m^3$)	Receptor UTM E (km)	Receptor UTM N (km)	Receptor Elevation (m)	Class II Increment ($\mu g/m^3$)
SO_2	3-hour	1.33	500550	4915830	15.55	512
	24-hour	1.20	500570	4915810	14.71	91
	Annual	0.06	500630	4915870	15.61	20
PM_{10}	24-hour	4.27	500550	4915850	14.24	30
	Annual	0.60	500630	4915870	15.61	17
$PM_{2.5}$	24-hour	8.46	500550	4915850	14.24	9
	Annual	0.60	500630	4915870	15.61	4
NO_2	Annual	7.36	500630	4915870	15.61	25

For the two pollutants/averaging periods whose modeled impacts were closest to their respective NAAQS and Class II increment standards, Figure 4 shows the locations of the maximum NO_2 (1-Hour averaging period) and $PM_{2.5}$ (24-Hour averaging period) predicted concentrations.

FIGURE 4: LOCATION OF MAXIMUM 1 HOUR NO_2 IMPACT



All data, site drawings and other information used in developing the AERMOD input and output modeling files can be made available for review to interested parties at the DEP-BAQ offices located in Augusta.

APPENDIX A:

CATERPILLAR 3516C (2050 ekW) GENERATOR SET DATA SHEETS

Cat® 3516C

Diesel Generator Sets

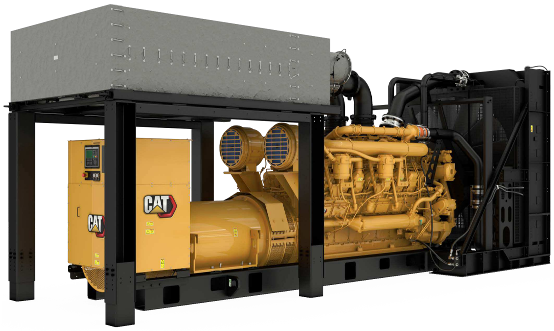


Image shown may not reflect actual configuration

Bore – mm (in)	170 (6.69)
Stroke – mm (in)	215 (8.46)
Displacement – L (in^3)	78 (4764.73)
Compression Ratio	14.7:1
Aspiration	TA
Fuel System	EUI
Governor Type	ADEM™ A4

Standby 60 Hz ekW (kVA)	Mission Critical 60 Hz ekW (kVA)	Prime 60 Hz ekW (kVA)	Continuous 60 Hz ekW (kVA)	Emissions Performance
2500 (3125)	2500 (3125)	2250 (2812)	2050 (2562)	U.S. EPA Tier 4 Final

Standard Features

Cat® Diesel Engine
- Meets U.S. EPA Tier 4 Final emission standards
- Reliable performance proven in thousands of applications worldwide

Generator Set Package
- Accepts 100% block load in one step and meets NFPA 110 loading requirements
- Conforms to ISO 8528-5 G3 load acceptance requirements
- Reliability verified through torsional vibration, fuel consumption, oil consumption, transient performance, and endurance testing

Alternators
- Superior motor starting capability minimizes need for oversizing generator
- Designed to match performance and output characteristics of Cat diesel engines

Cooling System
- Cooling systems available to operate in ambient temperatures up to 50°C (122°F)
- Tested to ensure proper generator set cooling

Clean Emissions Module
- Diesel oxidation catalyst for particulate matter (PM) and hydrocarbon (HC) control
- Selective catalytic reduction (SCR) for nitrogen oxides (NOx) control
- Integrated electronics for monitoring, protection, and closed loop NOx control

EMCP 4 Control Panels
- User-friendly interface and navigation
- Scalable system to meet a wide range of installation requirements
- Expansion modules and site specific programming for specific customer requirements

Warranty
- 24 months/1000-hour warranty for standby and mission critical ratings
- 12 months/unlimited hour warranty for prime and continuous ratings
- Extended service protection is available to provide extended coverage options

Worldwide Product Support
- Cat dealers have over 1,800 dealer branch stores operating in 200 countries
- Your local Cat dealer provides extensive post-sale support, including maintenance and repair agreements

Financing
- Caterpillar offers an array of financial products to help you succeed through financial service excellence
- Options include loans, finance lease, operating lease, working capital, and revolving line of credit
- Contact your local Cat dealer for availability in your region

CAT

Optional Equipment

Engine

Air Cleaner
- ❑ Single element
- ❑ Dual element

Muffler
- ❑ Industrial grade (12 dB)

Starting
- ❑ Standard batteries
- ❑ Oversized batteries
- ❑ Standard electric starter(s)
- ❑ Heavy duty electric starter(s)
- ❑ Air starter(s)
- ❑ Jacket water heater

Alternator

Output voltage
- ❑ 480V ❑ 6600V
- ❑ 600V ❑ 6900V
- ❑ 2400V ❑ 12470V
- ❑ 4160V ❑ 13200V
- ❑ 6300V ❑ 13800V

Temperature Rise (over 40°C ambient)
- ❑ 150°C
- ❑ 125°C/130°C
- ❑ 105°C
- ❑ 80°C

Winding type
- ❑ Random wound
- ❑ Form wound

Excitation
- ❑ Self excited
- ❑ Internal excitation (IE)
- ❑ Permanent magnet (PM)

Attachments
- ❑ Anti-condensation heater
- ❑ Stator and bearing temperature monitoring and protection

Power Termination

Type
- ❑ Bus bar
- ❑ Circuit breaker
- ❑ 1600A ❑ 2000A
- ❑ 2500A ❑ 3000A
- ❑ 3200A ❑ 4000A
- ❑ 5000A
- ❑ UL ❑ IEC
- ❑ 3-pole ❑ 4-pole
- ❑ Manually operated
- ❑ Electrically operated

Trip Unit
- ❑ LSI ❑ LSI-G
- ❑ LSIG-P

Control System

Controller
- ❑ EMCP 4.3
- ❑ EMCP 4.4

Attachments
- ❑ Local annunciator module
- ❑ Remote annunciator module
- ❑ Expansion I/O module
- ❑ Remote monitoring software

Charging
- ❑ Battery charger – 10A
- ❑ Battery charger – 20A
- ❑ Battery charger – 35A

Vibration Isolators
- ❑ Rubber
- ❑ Spring
- ❑ Seismic rated

Cat Connect

Connectivity
- ❑ Ethernet
- ❑ Cellular
- ❑ Satellite

Extended Service Options

Terms
- ❑ 2 year (prime)
- ❑ 3 year
- ❑ 5 year
- ❑ 10 year

Coverage
- ❑ Silver
- ❑ Gold
- ❑ Platinum
- ❑ Platinum Plus

Ancillary Equipment
- ❑ Automatic transfer switch (ATS)
- ❑ Uninterruptible power supply (UPS)
- ❑ Paralleling switchgear
- ❑ Paralleling controls

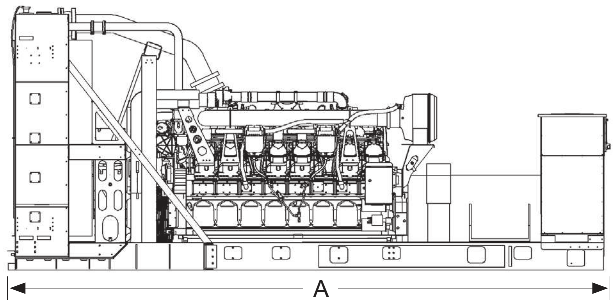
Certifications
- ❑ IBC seismic certification
- ❑ OSHPD pre-approval

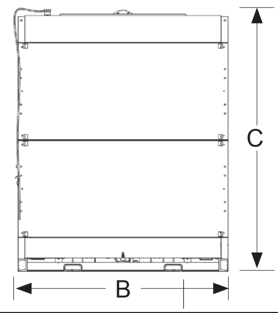
Note: *Some options may not be available on all models. Certifications may not be available with all model configurations. Consult factory for availability.*

Package Performance

Performance	Standby		Mission Critical		Prime		Continuous	
Frequency	60 Hz		60 Hz		60 Hz		60 Hz	
Gen set power rating with fan	2500 ekW		2500 ekW		2250 ekW		2050 ekW	
Gen set power rating with fan @ 0.8 power factor	3125 kVA		3125 kVA		2812 kVA		2562 kVA	
Emissions	Tier 4 Final		Tier 4 Final		Tier 4 Final		Tier 4 Final	
Performance number	DM9370-02		DM9301-02		DM9371-03		DM9372-02	
Fuel Consumption								
100% load with fan – L/hr (gal/hr)	654.5	(172.9)	654.5	(172.9)	589.0	(155.6)	538.5	(142.2)
75% load with fan – L/hr (gal/hr)	496.0	(131.0)	496.0	(131.0)	451.0	(119.1)	417.1	(110.2)
50% load with fan – L/hr (gal/hr)	356.6	(94.2)	356.6	(94.2)	328.0	(86.7)	304.0	(80.3)
25% load with fan – L/hr (gal/hr)	211.0	(55.7)	211.0	(55.7)	196.7	(52.0)	184.8	(48.8)
Diesel Exhaust Fluid (DEF) Consumption								
100% load with fan – L/hr (gal/hr)	50.8	(13.4)	50.8	(13.4)	43.8	(11.6)	39.1	(10.3)
75% load with fan – L/hr (gal/hr)	35.0	(9.2)	35.0	(9.2)	30.1	(7.9)	26.0	(6.9)
50% load with fan – L/hr (gal/hr)	18.1	(4.8)	18.1	(4.8)	15.7	(4.1)	13.8	(3.6)
25% load with fan – L/hr (gal/hr)	7.7	(2.0)	7.7	(2.0)	6.7	(1.8)	6.1	(1.6)
Cooling System								
Radiator air flow restriction (system) – kPa (in. water)	0.12	(0.48)	0.12	(0.48)	0.12	(0.48)	0.12	(0.48)
Radiator air flow – m^3/min (cfm)	3048.0	(107639)	3048.0	(107639)	3048.0	(107639)	3048.0	(107639)
Engine coolant capacity – L (gal)	233.0	(61.6)	233.0	(61.6)	233.0	(61.6)	233.0	(61.6)
Radiator coolant capacity – L (gal)	268.8	(71.0)	268.8	(71.0)	268.8	(71.0)	268.8	(71.0)
Total coolant capacity – L (gal)	501.8	(132.6)	501.8	(132.6)	501.8	(132.6)	501.8	(132.6)
Inlet Air								
Combustion air inlet flow rate – m^3/min (cfm)	197.8	(6983.8)	197.8	(6983.8)	196.7	(6577.3)	175.7	(6204.1)
Exhaust System								
Exhaust stack gas temperature – °C (°F)	522.9	(973.3)	522.7	(973.3)	505.0	(941.1)	493.5	(920.3)
Exhaust gas flow rate – m^3/min (cfm)	556.8	(19661.9)	556.8	(19661.9)	508.8	(17966.0)	469.7	(16586.0)
Exhaust system backpressure (maximum allowable) – kPa (in. water)	6.0	(24.0)	6.0	(24.0)	6.0	(24.0)	6.0	(24.0)
CEM outlet temperature – °C (°F)	501.7	(935.0)	501.7	(935.0)	488.1	(910.6)	478.9	(894.0)
Heat Rejection								
Heat rejection to jacket water – kW (Btu/min)	841	(47832)	8412	(47832)	765	(43514)	716	(40724)
Heat rejection to exhaust (total) – kW (Btu/min)	2571	(146192)	2571	(146192)	2308	(131244)	2108	(119903)
Heat rejection to aftercooler – kW (Btu/min)	665	(37839)	665	(37839)	579	(32928)	504	(28658)
Heat rejection to atmosphere from engine – kW (Btu/min)	167	(9525)	167	(9525)	157	(8945)	152	(8657)
Heat rejection to atmosphere from CEM – kW (Btu/min)	90.0	(5098)	90.0	(5098)	90.0	(5098)	85.6	(4874)
Heat rejection from alternator – kW (Btu/min)	121	(6853)	121	(6853)	106	(6028)	94	(5368)

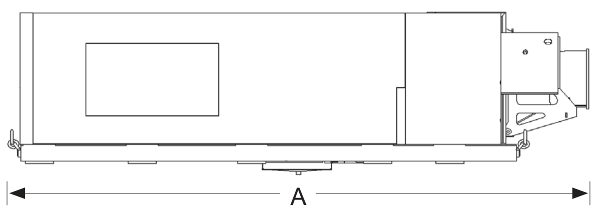
Weights and Dimensions

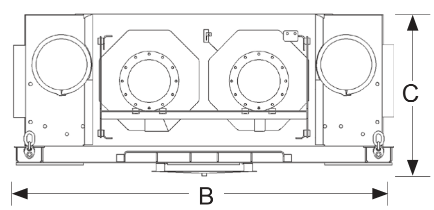




Dim "A" mm (in)	Dim "B" mm (in)	Dim "C" mm (in)	Dry Weight kg (lb)
7033 (276.9)	2569 (101.2)	3016 (118.7)	18 270 (40,280)

Note: *For reference only. Do not use for installation design. Contact your local Cat dealer for precise weights and dimensions.*





Dim "A" mm (in)	Dim "B" mm (in)	Dim "C" mm (in)	Dry Weight kg (lb)
3460 (136.2)	2257 (88.9)	895 (35.2)	2064 (4550)

Ratings Definitions

Standby
Output available with varying load for the duration of the interruption of the normal source power. Average power output is 70% of the standby power rating. Typical operation is 200 hours per year, with maximum expected usage of 500 hours per year.

Mission Critical
Output available with varying load for the duration of the interruption of the normal source power. Average power output is 85% of the mission critical power rating. Typical peak demand up to 100% of rated power for up to 5% of the operating time. Typical operation is 200 hours per year, with maximum expected usage of 500 hours per year.

Prime
Output available with varying load for an unlimited time. Average power output is 70% of the prime power rating. Typical peak demand is 100% of prime rated ekW with 10% overload capability for emergency use for a maximum of 1 hour in 12. Overload operation cannot exceed 25 hours per year.

Continuous
Output available with non-varying load for an unlimited time. Average power output is 70-100% of the continuous power rating. Typical peak demand is 100% of continuous rated kW for 100% of the operating hours.

Applicable Codes and Standards

AS 1359, CSA C22.2 No. 100-04, UL 142, UL 489, UL 869, UL 2200, NFPA 37, NFPA 70, NFPA 99, NFPA 110, IBC, IEC 60034-1, ISO 3046, ISO 8528, NEMA MG1-22, NEMA MG1-33, 2014/35/EU, 2006/42/EC, 2014/30/EU.

Note: Codes may not be available in all model configurations. Please consult your local Cat dealer for availability.

Data Center Applications

- ISO 8528-1 Data Center Power (DCP) compliant per DCP application of Cat diesel generator set prime power rating.
- All ratings Tier III/Tier IV compliant per Uptime Institute requirements.
- All ratings ANSI/TIA-942 compliant for Rated-1 through Rated-4 data centers.

Fuel Rates

Fuel rates are based on fuel oil of 35º API [16°C (60ºF)] gravity having an LHV of 42,780 kJ/kg (18,390 Btu/lb) when used at 29ºC (85ºF) and weighing 838.9 g/liter (7.001 lbs/U.S. gal.)

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