Secretary of the State File Number
6223

Regulation of the

Department of Energy & Environmental Protection

Concerning

Municipal Waste Combustors

Regulations adopted after July 1, 2013, become effective upon posting to the Connecticut eRegulations System, or at a later date if specified within the regulation.

Posted to the Connecticut eRegulations System on **August 2, 2016**

EFFECTIVE DATE
August 2, 2016

Approved by the Attorney General on
May 5, 2016

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July 26, 2016

Electronic copy with agency head certification statement electronically submitted to and received by the Office of the Secretary of the State on
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The text of this approved regulation will be published in the Connecticut Law Journal

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Form Regs-2 (NEW 7/2013)
State of Connecticut
Office of the Secretary of the State
Legislation and Elections Administration Division

Purpose and Legal Disclaimer: This form was designed to facilitate submission of the "statement from the department head" required by CGS 4-172(a) as amended by PA 12-92, Section 6. This form does not constitute legal advice. The Office of the Secretary of the State (SOTS) is not authorized to provide legal advice to state agencies. Consult with your agency's legal counsel before completing and submitting this form for filing

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Submit the electronic copy and its certification statement to the Secretary of the State at regulations.sots@ct.gov concurrently with the paper copy of the original regulation, as required by CGS Section 4-172 as amended.

Electronic Copy Certification Statement

I, **Robert J. Klee, Commissioner** of the **Department of Energy and Environmental Protection**, in accordance with the provisions of Section 4-172 of the *General Statutes of the State of Connecticut,* **do hereby certify**:

That the electronic copy of a regulation concerning **Municipal Waste Combustors**, which was approved by the Legislative Regulation Review Committee on **26 July 2016**, and which shall be submitted electronically for filing to the Secretary of the State by **Paula Gomez** of this agency on **or before August 8, 2016**, is a true and accurate copy of the original regulation approved in accordance with Sections 4-169 and 4-170 of the *General Statutes of the State of Connecticut*.

In testimony whereof, I have hereunto set my hand on August 2nd, 2016.

(Signature of agency head)

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State of Connecticut
Regulation of
Department of Energy and Environmental Protection
Concerning
Municipal Waste Combustors

Section 1. Subdivision (8) of subsection (c) of section 22a-174-38 of the Regulations of Connecticut State Agencies is amended as follows:

(8) No owner or operator of a municipal waste combustor shall cause or allow the emission of nitrogen oxides (NO_x) in excess of the applicable emission limit [identified in Table 38-2 of this subdivision.] as follows:

(A) Prior to the date specified in subparagraph (B) of this subdivision, in excess of the applicable emission limit listed in Table 38-2 of this subdivision; and

(B) Commencing twelve (12) months after the effective date of this subparagraph, in excess of the applicable emission limit listed in Table 38-2A of this subdivision.

Table 38-2. Nitrogen Oxides Emission Limits.

Municipal waste combustor technology	**Nitrogen oxides emission limit, measured in parts per million volume, corrected to seven percent oxygen, dry basis, or equivalent percentage carbon dioxide as specified in subdivision (12) of this subsection**
Mass burn refractory combustor	177
Mass burn waterwall combustor for which construction commenced on or before December 31, 1985	200
Mass burn waterwall combustor for which construction commenced after December 31, 1985	177
Processed-municipal solid waste combustor	146
Reciprocating grate waste tire fired incinerator/boiler	79

Table 38-2A. Additional Nitrogen Oxides Emission Limits.

Municipal waste combustor technology	**Nitrogen oxides emission limit, measured in parts per million volume, corrected to seven percent oxygen, dry basis, or equivalent percentage carbon dioxide as specified in subdivision (12) of this subsection**
Mass burn refractory combustor	177
Mass burn waterwall combustor	150

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Processed-municipal solid waste combustor	146
Reciprocating grate waste tire fired incinerator/boiler	79

Section 2. Subsection (c) of section 22a-174-38 of the Regulations of Connecticut State Agencies is amended by the addition of subdivisions (16) and (17) as follows:

(NEW)

(16) On and after January 1, 2018, no owner or operator of a municipal waste combustor unit using a selective non-catalytic reduction system for control of nitrogen oxides shall cause or allow the emission of ammonia in excess of the applicable emission limit identified in Table 38-4.

Table 38-4. Ammonia Emission Limit.

Air pollutant	Emission limit
Ammonia	20 parts per million by volume (ppmvd) at 7% oxygen

(17) Continuous compliance with the ammonia emission limit established in subdivision (16) of this subsection shall be determined based on either annual stack testing as specified in subsection (i)(4)(L) of this section or a CEM system as specified in subsection (j)(4) of this section.

Sec. 3. Subsection (d) of section 22a-174-38 of the Regulations of Connecticut State Agencies is amended as follows:

(d) [**Nitrogen oxides (NO_x) emissions trading program.**

(1) The owner or operator of a MWC unit for which construction commenced prior to December 20, 1989 may use emissions trading to meet some or all of the NO_x emission reductions required for compliance with the emission limits in subsection (c)(8) of this section, subject to the limitations described in this subsection for the NO_x emissions trading program.

(2) The owner or operator of a municipal waste combustor for which construction commenced on or after December 20, 1989 may participate in the NO_x emissions trading program described in this subsection as follows:

(A) Such owner or operator may not use NO_x Emission Reduction Credits (ERCs) to comply with the applicable NO_x emission limits in subsection (c) of this section; and

(B) Such owner or operator may create ERCs in accordance with the requirements of this subsection if actual NO_x emissions from a unit are lower than the applicable NO_x emission limits in subsection (c) of this section and lower than any applicable NO_x Trading Baseline.

(3) For inclusion in the NO_x emissions trading program, an owner or operator of a municipal waste combustor unit shall submit a NO_x trading protocol to the commissioner for review and written approval on or before December 1, 1999. The protocol shall include, at a minimum:

(A) A formal request to participate in the NO_x trading program;

(B) A NO_x Trading Baseline and supporting data. The NO_x Trading Baseline shall be determined as follows:

(i) If the historical actual twenty-four hour daily NO_x average (ppmv @ 7% O_2 or ppmv @ an

equivalent % CO_2, as specified in subdivision (12) of subsection (c) of this section) is higher than the applicable NO_x limit set forth in subsection (c) of this section, then the applicable subsection (c) NO_x limit shall be the NO_x Trading Baseline,

(ii) If the historical actual twenty-four hour daily NO_x average (ppmv @ 7% O_2 or ppmv @ an equivalent % CO_2, as specified in subdivision (12) of subsection (c) of this section) is lower than the applicable NO_x limit set forth in subsection (c) of this section and such lower average concentration is the result of installation of control equipment or modification of a MWC unit solely for the purposes of meeting the requirements of this regulation or section 22a-174-22 of the Regulations of Connecticut State Agencies, then the applicable NO_x limit of subsection (c) of this section shall be the NO_x Trading Baseline. Control equipment or modifications installed prior to 1990, or installed on new sources since 1990 or installed to meet BACT or LAER requirements shall not be considered as having been installed as a result of the requirements of this section or section 22a-174-22, or

(iii) If the historical actual twenty-four hour daily NO_x average (ppmv @ 7% O_2 or ppmv @ an equivalent % CO_2, as specified in subsection (c)(12) of this section) is lower than the applicable NO_x limit set forth in subsection (c) of this section, then a NO_x Trading Baseline shall be established based on the historical actual twenty-four hour daily NO_x average;

(C) A detailed methodology for determining and recording hourly heat input (mmBTU/hr); and

(D) All calculations, using the formulas provided in subdivision (4)(E) of this subsection, of the number of ERCs created and/or used. Calculations shall specify unit-specific values for NO_x limits, f-factors and CO_2 correction factors, as applicable.

(4) The owner or operator of a municipal waste combustor uni$_t$ participating in the MWC NO_x emissions trading program shall use the following methodology to determine on a daily basis the quantity of ERCs created or used:

(A) Calculate NO_x Daily Average Concentration (24-hour block arithmetic average basis) and compare it to the applicable NO_x limit of subsection (c)(8) of this section;

(B) If the NO_x Daily Average Concentration is greater than the applicable NO_x limit of subsection (c)(8) of this section, then calculate the number of ERCs used;

(C) If the NO_x Daily Average Concentration is less than the applicable NO_x limit of subsection (c)(8) of this section but greater than the NO_x Trading Baseline, then ERCs shall neither be used nor created;

(D) If the NO_x Daily Average Concentration is less than the NO_x Trading Baseline, calculate the number of ERCs created; and

(E) Use the following formulas to calculate the number of ERCs used or created:

lbs ERCs used =

[NO_x Daily Average Concentration - (0.95 x applicable NO_x limit of sub section (c)(8) of this section)]

x [1.194 x 10^{-7}] x [Diluent Correction] x [f-factor]

x [Daily Heat Input Rate Average]

x [# of Actual Operating Hours in the Daily Averaging Period]

lbs ERCs created =

[NO_x Trading Baseline - NO_x Daily Average Concentration]

x [1.194 x 10^{-7}] x [Diluent Correction] x [f-factor]

^{x} [Daily Heat Input Rate Average]

x [# of Actual Operating Hours in the Daily Averaging Period]

x [0.85]

where:

NO_xDaily Average Concentration: Average of all valid hourly NO_x values (ppmvd @ 7% O_2 or ppmv @ an equivalent % CO_2) recorded during the Daily Averaging Period.

1.194×10^{-7}: NO_x concentration conversion factor.

Diluent Correction: If O_2 is used as the diluent, then the diluent correction = [20.9 / 20.9 - 7]. If CO_2 is used as the diluent, then the diluent correction = [100 / equivalent % CO_2].

f-factor: If O_2 is used as the diluent, then fd is in the units of dscf/mmBTU. If CO_2 is used as the diluent, then fc is in the units of scf/mmBTU. An f-factor may be either unit-specific or adopted from Table 19-1 in 40 CFR 60, Appendix A, Method 19.

Daily Heat Input Rate Average: Average of all valid hourly Heat Input Rate values (mmBTU/hr) recorded during the Daily Averaging Period.

Daily Averaging Period: The total of all operating hours in a day during which municipal solid waste is being fed to a boiler and/or when the boiler load is at least 75% of maximum rated capacity.

NO_x Trading Baseline: The NO_x concentration used as the baseline from which ERC creation is determined. The Trading Baseline will be the applicable NO_x limit of subsection (c)(8) of this section or, if the historical actual daily average concentration is less than the applicable NO_x limit of subsection (c)(8) of this section, the value established by the commissioner (ppmvd @ 7% O_2 or ppmv @ an equivalent % CO_2).

0.85: This factor represents 10% ERC retirement for environmental benefits and 5% retirement for heat input measurement uncertainties. If the owner or operator installs and calibrates exhaust gas flow monitors in a manner acceptable to the commissioner, certifies that the equipment specifications have been met and are being met and uses such monitors to determine heat input to the unit, then 0.90 can be substituted for 0.85.

(5) Any MWC owner or operator seeking to create ERCs pursuant to this subsection shall:

(A) In accordance with subsection (k) of this section, maintain records for each MWC unit showing daily NOx mass emissions, actual NO_x concentrations (24-hour average), daily operating hours and ERCs created;

(B) Submit a written request to the commissioner for approval of ERCs created prior to the use, sale or transfer of such ERCs. Such request shall include the following minimum information:

(i) the monthly operating reports of actual fuel use in mmBTU,

(ii) the daily actual NOx mass emissions and NO_x concentrations (24-hour average),

(iii) the number of valid data hours in each 24-hour period for which approval is requested,

(iv) the number of operating hours per day, and

(v) the quantity of ERCs created; and

(C) Create all such ERCs prior to January 1, 2009.

(6) Any MWC owner or operator intending to use ERCs pursuant to this subsection shall:

(A) No later than the first day of each calendar month, calculate, in tons, ERCs per month for each MWC unit, the projected maximum number of ERCs required for that calendar month using the formulas provided in subdivision (4)(E) of this subsection;

(B) No later than the first day of each calendar month, acquire a sufficient number of ERCs approved by the commissioner to match the quantity needed as determined according to subparagraph (A) of this subdivision. The quantity needed may be satisfied with unused ERCs created or acquired in previous months, subject to the restrictions of subparagraph (D) of this subdivision. Credits to be used during the ozone season must have been generated during the ozone season;

(C) No later than the twentieth day of each month, calculate and record the actual quantity of ERCs used in the preceding calendar month;

(D) Maintain documentation demonstrating that ERCs used during the ozone season were generated during an ozone season. An ERC generator certification shall be sufficient for such demonstration;

(E) An ERC used to meet the emission limits contained herein shall have been created within the five calendar years preceding the year of such ERC use; and

(F) For the purposes of subparagraph (E) of this subdivision, an ERC is considered created in the same calendar year the NO_x emission reduction occurs at a plant or source.

(7) No later than March 1 of each year, the MWC owner or operator shall provide to the commissioner a report containing the following information:

(A) A record for the previous calendar year of each use, sale or other transfer of any and all of the ERCs created in accordance with this subsection; and

(B) A record for the previous calendar year of actual NO_x emissions from the facility and each MWC unit, the quantity of ERCs created and the quantity of ERCs used, on a monthly basis and an ozone season basis.

(8) Any reports required by this subsection shall be made on forms furnished or prescribed by the commissioner.

(9) Any creation or use of ERCs for the purposes of this subsection shall conform to the provisions of the U.S. Environmental Protection Agency's "Economic Incentive Program Rules," 40 CFR 51, Subpart U.

(10) Any emission reductions under this subsection for the purposes of ERC creation shall:

(A) Be calculated in a reliable and replicable manner; and

(B) Not be a reduction required by any provision of the state implementation plan at the time the reduction was made, and shall not be a reduction relied upon in an applicable attainment demonstration or required by state or federal permit or order, except where a state or federal permit or order is used to set a NO_x trading baseline as defined by subdivision (3) of this subsection.

(11) It shall be a violation of this section if the calculation specified by subdivision (6)(C) this subsection demonstrates that any MWC owner or operator did not hold or acquire a sufficient number of ERCs to comply with the NO_x emission limits contained herein. In addition, the MWC owner or operator shall acquire additional ERCs in an amount equal to three (3) ERCs for every one (1) ERC needed for compliance, had the ERCs been held or acquired at the time specified in subdivision (6)(B) of this subsection. The additional ERCs shall be acquired on or before the last day of the calendar month in which the calculation specified by subdivision (6)(C) of this subsection is performed. Nothing herein shall preclude the commissioner from taking other enforcement action against the owner or operator for failing to hold or acquire a sufficient number of ERCs prior to their use.

(12) All ERCs created pursuant to this section shall expire prior to May 1, 2013. On and after May 1, 2013, the use or trading of ERCs created pursuant to this section is prohibited.] Reserved.

Sec. 4. Subdivision (4) of subsection (i) of section 22a-174-38 of the Regulations of Connecticut State Agencies is amended as follows:

(4) Each MWC owner or operator shall employ the following methodologies:

(A) Testing for particulate matter and opacity levels shall be conducted in accordance with the following procedures:

(i) 40 CFR 60, Appendix A, Reference Method 1 shall be used to select the sampling site and number of traverse points for particulate matter testing,

(ii) 40 CFR 60, Appendix A, Reference Method 3 shall be used for flue gas analysis for particulate matter testing,

(iii) 40 CFR 60, Appendix A, Reference Method 5 or 29 shall be used for determining compliance with the particulate matter emission limit. For each Method 5 or Method 29 test run: the minimum sample volume shall be 1.7 cubic meters; the probe and filter holder heating systems in the sample train shall be set to provide a gas temperature no greater than 160 [+/- 14] degrees centigrade; and an

oxygen or carbon dioxide measurement shall be obtained simultaneously. For each Method 29 test run, the minimum sample time shall be two (2) hours,

(iv) 40 CFR 60, Appendix A, Reference Method 9 shall be used for determining compliance with the opacity emissions limit, except as provided under 40 CFR 60.11(e), and

(v) The compliance determination for particulate matter shall be based on an arithmetic average determined using all data generated in three (3) test runs as required by this section;

(B) Testing for cadmium and lead levels shall be conducted in accordance with the following procedures:

(i) 40 CFR 60, Appendix A, Reference Method 1 shall be used for determining the location and number of sampling points,

(ii) 40 CFR 60, Appendix A, Reference Method 3 shall be used for flue gas analysis,

(iii) 40 CFR 60, Appendix A, Reference Method 29 shall be used for determining compliance with the cadmium and lead emission limits,

(iv) An oxygen or carbon dioxide measurement shall be obtained simultaneously with each Method 29 test run for cadmium and lead required under this section,

(v) The minimum sample time shall be two (2) hours per each Method 29 test run, and

(vi) The compliance determinations for cadmium and lead shall be based on an arithmetic average determined using all data generated in three (3) test runs as required by this section;

(C) Testing for mercury levels shall be conducted in accordance with the following procedures:

(i) 40 CFR 60, Appendix A, Reference Method 1 shall be used for determining the location and number of sampling points,

(ii) 40 CFR 60, Appendix A, Reference Method 3 shall be used for flue gas analysis,

(iii) 40 CFR 60, Appendix A, Reference Method 29 shall be used for determining compliance with the mercury emission limits. An oxygen or carbon dioxide measurement shall be obtained simultaneously with each Method 29 test run for mercury required under this section,

(iv) The minimum sample time shall be two (2) hours per each Method 29 test run,

(v) The percent reduction in the potential mercury emissions ($\%P_{Hg}$) is computed using the following:

$$\left(\%P_{Hg}\right) = \left(\frac{E_i - E_o}{Ei}\right) \times 100$$

where:

$\%P_{hg}$ = percent reduction of the potential mercury emissions achieved.

E_i = potential mercury emission concentration measured at the control device inlet, corrected to 7% O_2 (dry basis).

E_o = controlled mercury emission concentration measured at the mercury control device outlet, corrected to 7_2 (dry basis), and

(vi) The compliance determinations for mercury shall be based on an arithmetic average of emission concentrations or percent reductions determined using all data generated in a minimum of at least three (3) test runs as required by this section;

(D) Compliance with the sulfur dioxide emission limit (measured as a concentration or as a percent reduction by weight or volume) shall be determined by using the CEM system specified in subsection (j)(1) of this section;

(E) Compliance with the nitrogen oxide emission limit shall be determined by using the CEM system specified in subsection (j)(1) of this section;

(F) Compliance with the carbon monoxide emission limit shall be determined by using the CEM system specified in subsection (j)(1) of this section;

(G) Testing for hydrogen chloride levels shall be conducted in accordance with the following procedures:

(i) 40 CFR 60, Appendix A, Reference Method 26 or 26A, as applicable, shall be used to determine the hydrogen chloride emission concentration. The minimum sampling time for Method 26 shall be one (1) hour,

(ii) An oxygen or carbon dioxide measurement shall be obtained simultaneously with each Method 26 test run for hydrogen chloride required by this section,

(iii) The percent reduction in potential hydrogen chloride emissions (% P_{HCl}) shall be computed using the following equation:

$$\left(\%P_{HCl}\right) = \left(\frac{E_i - E_o}{Ei}\right) \times 100$$

where:

$\%P_{HCl}$ = percent reduction of the potential hydrogen chloride emissions achieved.

E_i = potential hydrogen chloride emission concentration measured at the control device inlet, corrected to 7% O_2 (dry basis).

EE_o = controlled hydrogen chloride emission concentration measured at the control device outlet, corrected to 7 % O_2 (dry basis), and

(iv) The compliance determination for hydrogen chloride shall be based on an arithmetic average of emission concentrations or percent reductions determined using all data generated in three (3) test runs as required by this section;

(H) Testing for dioxin/furan levels shall be conducted in accordance with the following procedures:

(i) 40 CFR 60, Appendix A, Reference Method 1 shall be used for determining the location and number of sampling points,

(ii) 40 CFR 60, Appendix A, Reference Method 3 shall be used for flue gas analysis,

(iii) 40 CFR 60, Appendix A, Reference Method 23 shall be used for determining the dioxin/furan emission concentration,

(iv) The minimum sample time shall be four (4) hours per test run,

(v) An oxygen or carbon dioxide measurement shall be obtained simultaneously with each Method 23 test run for dioxin/furan required by this section, and

(vi) The compliance determination for dioxin/furan levels shall be based on an arithmetic average determined using all data generated as required by this section in three (3) test runs;

(I) Testing for fugitive ash emissions shall be conducted in accordance with the following procedures:

(i) 40 CFR 60, Appendix A, Reference Method 22 shall be used for determining compliance with the fugitive ash emissions limit,

(ii) The minimum observation time shall be a series of three (3) one-hour observations, and

(iii) The observation period shall include representative operational times when the facility is transferring ash from the municipal waste combustor unit to the area where ash is stored or loaded into containers or trucks;

(J) Testing for the relationship between carbon dioxide and oxygen shall be conducted in accordance with the following procedures:

(i) At least three (3) test runs of CO_2 and O_2 diluent data shall be obtained using the procedures and methods contained in 40 CFR 60, Appendix A, Reference Method 3A or 3B,

(ii) For each test run, using the following equation, a calculation shall be made of the CO_2 correction factor which is equivalent to a 7% O_2 correction factor:

$$CO_2\ correction\ factor = \frac{13.9}{\left(20.9 - O_{2measured}\right)} \times CO_{2measured}$$

, and

(iii) Calculation of a unit-specific equivalent CO_2 correction factor shall be the arithmetic mean of the result obtained from the three (3) test runs and the calculation of the CO_2 correction factor for each test run pursuant to subparagraph (J)(ii) of this subdivision, rounded to the nearest whole number; [and]

(K) During the performance tests for dioxin/furan and mercury, as applicable, the owner or operator shall estimate an average carbon mass feed rate based on carbon injection system operating parameters such as the screw feeder speed, hopper volume, hopper refill frequency, or other parameters appropriate to the feed system being employed, as follows:

(i) An average carbon mass feed rate in kilograms per hour or pounds per hour shall be estimated during the initial performance test for mercury emissions and each subsequent performance test for mercury emissions, and

(ii) An average carbon mass feed rate in kilograms per hour or pounds per hour shall be estimated during the initial performance test for dioxin/furan emissions and each subsequent performance test for dioxin/furan emissions[.] ;and

(L) Compliance with the ammonia emission limit established in subdivision (16) of subsection (c) of this section shall be determined for each unit by either using a CEM system specified in subdivision (4) of subsection (j) of this section or annual stack testing conducted in accordance with the following procedures:

(i) 40 CFR 60, Appendix A, Reference Method 26A or another method approved by the commissioner and the EPA shall be used to determine compliance with the ammonia emission limit,

(ii) The emission compliance determination for ammonia shall be based on an arithmetic average determined using all data generated in three test runs, and

(iii) The minimum sample time shall be one hour per each Method 26A test run.

Sec 5. Subsection (i) of section 22a-174-38 of the Regulations of Connecticut State Agencies is amended by adding subdivision (5) as follows:

(NEW)

(5) The initial performance test for ammonia, as applicable, shall be conducted at the time the first annual performance test after January 1, 2018 is conducted. Subsequent annual performance tests for ammonia shall be conducted not earlier than nine (9) calendar months and not later than fifteen (15) calendar months following the previous performance test for ammonia.

Sec. 6. Subsection (j) of section 22a-174-38 of the Regulations of Connecticut State Agencies is amended by adding subdivision (4) as follows:

(NEW)

(4) The owner or operator of a municipal waste combustor unit at which a selective non-catalytic reduction system is installed and operated for control of NOx emissions may install, operate and calibrate, in a manner acceptable to the commissioner, a CEM system for measuring ammonia emissions and certify to the commissioner, in writing, that the equipment specifications for the CEM system have been met. Continuous compliance with the emission limit for ammonia shall be determined based on a 24-hour daily average. The owner or operator using a CEM system to measure ammonia emissions shall meet the following requirements:

(A) Ammonia CEM system performance specifications and quality assurance procedures are subject to review by the commissioner and shall not be implemented until approval from the commissioner has been received; and

(B) The owner or operator shall be required to monitor ammonia slip at each MWC unit, as follows:

(i) Data available for the ammonia CEM system shall not be less than ninety percent (90%) of the total operating hours in any one calendar quarter and not less than ninety-five percent (95%) of the total operating hours in any one calendar year,

(ii) Obtain valid 1-hour averages for seventy-five percent (75%) of the operating hours per day for ninety percent (90%) of the operating days per calendar quarter during which the unit combusts any municipal solid waste,

(iii) At least three equally spaced data points per hour shall be used to calculate a one hour average,

(iv) Notify the commissioner according to subsection (l)(3)(A)(v) of this section in the event of failure to obtain the minimum data required by subparagraphs (B)(i) and (B)(ii) of this subdivision, and

(v) The percentage of data available shall be calculated as follows:

(I) In accordance with the procedures specified on forms furnished or prescribed by the commissioner, and

(II) Using all data obtained from a CEM system to calculate emissions concentrations and percent reductions as required by this section regardless of whether the minimum data availability requirements of subparagraphs (B)(i) and (B)(ii) of this subdivision are obtained.

Sec. 7. Subdivisions (9) and (10) of subsection (k) of section 22a-174-38 of the Regulations of Connecticut State Agencies are amended as follows:

(9) The test reports and supporting calculations documenting the results of an initial performance test conducted to determine compliance with the emission limits specified in this section for particulate matter, opacity, cadmium, lead, mercury, dioxin/furan emissions, hydrogen chloride, [and] fugitive ash <u>and, as applicable, ammonia,</u> shall be recorded. The maximum demonstrated municipal waste combustor unit load and maximum demonstrated particulate matter control device temperature shall be recorded for the initial performance test for dioxin/furan emissions for each particulate matter control device. The test results and supporting calculations documenting the relationship between carbon dioxide and oxygen concentrations established in accordance with this section shall be recorded if established during the initial performance test.

(10) The test reports and supporting calculations documenting the results of all annual performance tests conducted to determine compliance with the emission limits specified in this section for particulate matter, cadmium, lead, mercury, dioxin/furan emissions, hydrogen chloride, [and] fugitive ash <u>and, as applicable, ammonia,</u> shall be recorded. The maximum demonstrated

municipal waste combustor unit load and maximum demonstrated particulate matter control device temperature (for each particulate matter control device) shall be recorded for each performance test for dioxin/furan emissions. The relationship between carbon dioxide and oxygen concentrations shall be recorded if the relationship is reestablished during the annual performance test.

Sec. 8. Subdivision (3) of subsection (l) of section 22a-174-38 of the Regulations of Connecticut State Agencies is amended as follows:

(3) [Except as set forth in subparagraph (D) of this subdivision, the] The MWC owner or operator shall submit an annual report to the commissioner no later than January 30 of each year following the calendar year in which the data were collected. Each annual report shall include the following information:

(A) A summary of data collected for each pollutant regulated under this section and all applicable parameters, as follows:

(i) A list of the particulate matter, opacity, cadmium, lead, mercury, dioxin/furan, hydrogen chloride, [and] fugitive ash and, as applicable, ammonia emission levels, achieved during all initial and annual performance tests, [. Dioxin/furan emissions shall be reported as required in subdivision (1)(B) of this subsection,]

(ii) A list of the highest emission level recorded for sulfur dioxide, nitrogen oxides, carbon monoxide, municipal waste combustor unit load, [and] particulate matter control device inlet temperature and, as applicable, ammonia based on the data recorded for 24-hour daily geometric averages, 24-hour daily averages, or 4-hour block averages, as applicable, for the aforementioned pollutants,

(iii) The highest six-minute average opacity level measured,

(iv) The relationship between carbon dioxide and oxygen, if such relationship is reestablished, including test results, identification of the units tested and the date and time of each test run, and, as necessary, a schedule for making the appropriate modifications to the CEM system to incorporate the equivalent % CO_2 correction factor,

(v) The total number of days that the minimum number of hours of data for sulfur dioxide, nitrogen oxides, carbon monoxide, municipal waste combustor unit load, particulate matter control device temperature and, as applicable, carbon mass feed rate and ammonia were not obtained, and

(vi) The total number of hours that data for sulfur dioxide, nitrogen oxides, carbon monoxide, municipal waste combustor unit load, particulate matter control device temperature and, as applicable, carbon mass feed rate and ammonia were excluded from the calculation of average emission concentrations or parameters;

(B) The information required by subparagraphs (A)(i), (A)(ii) and (A)(iii) of this subdivision for the previous calendar year; and

(C) The data summaries required by subparagraphs (A) and (B) of this subdivision shall highlight any emission or parameter levels that did not achieve the emission or parameter limits specified under this section.

Sec. 9. Subdivision (6) of subsection (l) of section 22a-174-38 of the Regulations of Connecticut State Agencies is amended as follows:

(6) The MWC owner or operator shall provide written notification to the commissioner within seventy-two (72) hours of the time at which such owner or operator receives information regarding performance test results indicating that any particulate matter, opacity, cadmium, lead, mercury,

dioxin/furan, hydrogen chloride, ammonia or fugitive ash emission levels exceed the applicable pollutant emission limits or standards defined in this section.

Sec. 10. Subsection (a) of section 22a-174-38 of the Regulations of Connecticut State Agencies is amended as follows:

(a) **Definitions.** For purposes of this section:

(1) "Calendar quarter" means a consecutive three-month period (nonoverlapping) beginning on January 1, April 1, July 1 or October 1.

(2) "Calendar year" means the twelve consecutive month period starting on January 1 and ending on December 31.

(3) "Chief operator" means an individual who is in direct charge of the operation of a municipal waste combustor plant and who is responsible for overall on-site supervision, technical direction, management and performance of the plant.

(4) "Continuous burning" means the continuous, semi-continuous or batch feeding of municipal solid waste for purposes of waste disposal, energy production or providing heat to the combustion system in preparation for waste disposal or energy production. Continuous burning does not include the use of municipal solid waste solely to provide thermal protection of the grate or hearth during the startup period when municipal solid waste is not being fed to the grate.

(5) "Continuous emission monitoring system" or "CEM system" means a monitoring system for continuously measuring the emissions of any pollutant from a MWC unit.

(6) "Dioxin/furan" means tetra-chlorinated dibenzo-p-dioxins and dibenzofurans through octa-chlorinated dibenzo-p-dioxins and dibenzofurans.

(7) "Dscf/mmBTU" means dry cubic feet at standard conditions per million British thermal unit.

(8) "Eight-hour block average" or "8-hour block average" means the arithmetic mean of all hourly emission concentrations or parameter levels when a municipal waste combustor unit is operating and combusting municipal solid waste measured over any of the following three 8-hour periods of time: midnight to 8 a.m.; 8 a.m. to 4 p.m.; or 4 p.m. to midnight.

(9) "F-factor," "fc" or "fd" means a ratio of combustion gas volume to heat input either unit-specific or as defined in 40 CFR 60, Appendix A, Method 19.

(10) "Four-hour block average" or "4-hour block average" means the arithmetic mean of all hourly emission concentrations or parameter levels when a municipal waste combustor unit is operating and combusting municipal solid waste measured over any of the following six 4-hour periods of time: midnight to 4 a.m.; 4 a.m. to 8 a.m.; 8 a.m. to noon; noon to 4 p.m.; 4 p.m. to 8 p.m.; or 8 p.m. to midnight.

(11) "Historical actual twenty-four hour daily NO_x average" means one or more calendar years of CEM data from no earlier than 1994 or another period of data approved by the commissioner as representative of NO_x emissions.

(12) "Malfunction" means any sudden, infrequent and not reasonably preventable failure of air pollution control equipment, process equipment or a process to operate in a normal or usual manner. A failure that is caused in part by poor maintenance or negligent or careless operation shall not be considered a malfunction.

(13) "Mass burn waterwall combustor" means a field-erected combustor that combusts primarily unprocessed municipal solid waste (i.e., municipal solid waste that is not processed-municipal solid waste) in a waterwall furnace.

(14) "Maximum demonstrated municipal waste combustor unit load" means the highest 4-hour block average municipal waste combustor unit load achieved during four consecutive hours of

operation that corresponds to a test run during the most recent dioxin/furan emissions performance test that demonstrates compliance with the applicable limit for dioxin/furan specified in subsection (c) of this section.

(15) "Maximum demonstrated particulate matter control device temperature" means the highest 4-hour block average flue gas temperature measured at the particulate matter control device inlet during four consecutive hours of operation that corresponds to a test run during the most recent dioxin/furan emissions performance test that demonstrates compliance with the applicable limit for dioxin/furan specified in subsection (c) of this section.

(16) "mg/dscm" means milligrams of air pollutant per dry standard cubic meter.

(17) "Modification" means "modification or modified municipal waste combustor unit" as defined in 40 CFR 60.51b.

(18) "Municipal solid waste" means municipal solid waste as defined in section 22a-207 of the Connecticut General Statutes.

(19) "Municipal waste combustor," "municipal waste combustor unit" or "MWC" means any part or activity of any stationary source which part or activity emits or has the potential to emit any regulated air pollutant or any hazardous air pollutant, exclusive of associated air pollution control equipment, that combusts municipal solid waste, inclusive of those emissions units constructed prior to January 1, 2007 combusting a single-item waste stream of tires. Combustors that combust landfill gases collected by landfill gas collection systems are not municipal waste combustors.

(20) "Municipal waste combustor plant" or "plant" means any premises at which one or more municipal waste combustor units are situated.

(21) "Municipal waste combustor unit load" means the rate at which steam is produced at a municipal waste combustor (measured in lbs/hr or kg/hr).

(22) "ng/dscm" means nanograms of air pollutant per dry standard cubic meter.

(23) "NO_x Emissions Reductions Credit" or "ERC" means an air pollutant reduction created in the nitrogen oxides emissions trading program described by this section.

(24) ["NO_x Trading Baseline" means that value, determined as specified in subsection (d) of this section, used to calculate the quantity of ERCs created or used by a MWC unit.] Reserved.

(25) "Ozone season" means the period of any calendar year beginning on May 1 and ending on September 30.

(26) "Premises" means the grouping of all stationary sources at any one location and owned by or under the control of the same person or persons.

(27) "Processed-municipal solid waste" means a type of municipal solid waste produced by sorting municipal solid waste by size and/or altering the size of municipal solid waste through mechanical means.

(28) "Processed-municipal solid waste combustor" means a steam-generating MWC that burns processed-municipal solid waste in a semisuspension firing mode using air-fed distributors.

(29) "Reciprocating grate waste tire fired incinerator/boiler" means a combustor that burns tires as its principal fuel.

(30) "Scf/mmBTU" means cubic feet at standard conditions per million British thermal unit.

(31) "Shift operator" means an individual who is in direct charge of the operation of a shift of a municipal waste combustor plant and who is responsible for on-site supervision, technical direction, management and overall performance of the plant during a shift.

(32) "Shutdown period" means the period of time commencing when a municipal waste combustor operator discontinues the feed of municipal solid waste to the combustor in order to cease operation.

(33) "Six-minute arithmetic average" or "6-minute arithmetic average" means the arithmetic mean calculated from thirty-six (36) or more data points equally spaced over each 6-minute period.

(34) "Standard conditions" means a temperature of 20 degrees centigrade and a pressure of 101.3 kilopascals.

(35) "Startup period" means that period of time commencing when a municipal waste combustor begins the continuous burning of municipal solid waste, exclusive of any warmup period when a municipal waste combustor is combusting fossil fuel or other nonmunicipal solid waste fuel, and no municipal solid waste is being fed to the combustor.

(36) "Total mass" or "total mass dioxin/furan" means the total mass of tetra-through octa-chlorinated dibenzo-p-dioxins and dibenzofurans, as determined using EPA Reference Method 23 and the procedures specified under subsection (i)(4) of this section.

(37) "Twenty-four hour daily average" means the arithmetic mean of all hourly emission concentrations as required by this section when a unit is operating and combusting municipal solid waste measured over a 24-hour period between midnight and the following midnight.

(38) "Twenty-four hour daily geometric average" means the geometric mean of hourly emission concentrations as required by this section when a unit is operating and combusting municipal solid waste measured over a 24-hour period between midnight and the following midnight. The geometric mean shall be calculated using the following equation:

$$G = e^{\left[\frac{1}{n}\sum_{j=1}^{n}\left[\ln\left(A_j\right)\right]\right]}$$

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where:

G = daily geometric average pollutant concentration, corrected to 7% O_2 or equivalent percent CO_2;

A_j = arithmetic average pollutant concentration, for hour j, corrected to 7% O_2 or equivalent percent CO_2;

n = total number of hourly averages for which pollutant concentrations are available within the 24 hour midnight to midnight daily period;

ln = the natural log function; and

e = the natural logarithmic base (2.718).

(39) "Waterwall furnace" means a combustion unit having energy (heat) recovery in the furnace (i.e., radiant heat transfer section) of the combustor.

Sec. 11. Section 22a-174-38 of the Regulations of Connecticut State Agencies is amended by adding subsection (e) as follows:

(NEW)

(e) Reserved.

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Statement of Purpose

This amendment concerns an existing regulation that addresses air emissions from Connecticut's municipal waste combustors (MWCs). This amendment was initiated as one of DEEP's several actions to address a mandate of the U.S. Environmental Protection Agency (EPA) to review existing nitrogen oxide (NOx) emissions limits for major sources, such as the MWCs. Section 1 of this amendment reduces the NOx emission limits for mass burn waterwall type combustors from the current limits of 200 ppmvd and 177 ppmvd (depending on the date of construction of the facility) to 150 ppmvd.

This amendment adds also an emission limit and monitoring requirements for ammonia from the units that use selective non-catalytic reduction (SNCR) to control NOx emissions (Sections 2, 4-9) to ensure that emissions of fine particulate matter do not increase.

SNCR systems use urea or ammonia as a reagent, and unreacted ammonia that passes through the boiler is referred to as ammonia "slip." All of Connecticut's large MWCs are controlled by SNCR. As the current emissions limits for NOx are reduced under this proposal, DEEP is concerned that levels of ammonia slip may increase as more reagent is used to control NOx emissions to meet the more stringent NOx emissions limit. The new ammonia emissions limit is the same limit established in air permits for some of the MWCs. A requirement to test emissions to determine compliance with the new emissions limit is also added, on the same schedule as testing for other pollutants regulated by RCSA section 22a-174-38.

Ammonia is a hazardous air pollutant that contributes to the formation of fine particulate matter. Fine particulate matter is a complex mixture of extremely small particles (less than 2.5 micrometers in diameter) and liquid droplets that can be directly emitted from different sources such as forest fires, power plants, industries and automobiles. Fine particles are easily inhaled deep into the lungs where the particles may accumulate or react. Fine particles are also associated with other significant health problems and environmental damage. For these reasons, EPA regulates fine particulate matter as one of six criteria pollutants and requires each state to meet a national standard. Although Connecticut is currently in attainment of the federal standard for fine particulate matter, DEEP must ensure that emissions of fine particulate matter and its precursors do not increase, and therefore, DEEP is concerned about potentially significant sources of precursors of fine particulate matter such as ammonia. Ammonia compounds in the air also impair visibility, which is subject to regulation under the Clean Air Act.

Sections 3 and 10 of this amendment are rule maintenance actions that eliminate the requirements for a NOx trading program that sunset as of May 1, 2013.

Finally, DEEP added a placeholder (a "reserved" designation) for subsection (e), because that subsection designation is missing in the official version of RCSA section 22a-174-38 (Section 11).

The legal impact of the proposal is three new requirements on owners and operators of MWCs:

- A new requirement, on the owners and operators of mass burn waterwall municipal MWCs to comply with a more stringent NOx emission limit (150 ppmvd @ 7% O2). The lower NOx limit is consistent with an emission limit in place in New Jersey and proposed in Massachusetts.
- A new ammonia emission limit of 20 ppmvd @ 7% O2 on units controlled by selective non-catalytic reduction (SNCR) systems, which is the case for every mass burn waterwall type unit. The new ammonia emission limit is necessary because of the potential increase in ammonia emissions that can result from the operation of the SNCR to comply with the more stringent NOx emission limit.
- As a result of the new ammonia emission limit, MWCs owners/operators are required to demonstrate compliance with the new ammonia emission limit by either continuous emission

monitoring or annual stack testing.
DEEP will have the responsibility to enforce the new requirements and will do so with current staff and other resources.
In combination, the new requirements are necessary to ensure that the MWCs continue to operate in a manner that is consistent with Connecticut's clean air goals.

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AGENCY CERTIFICATION

Department of Energy and Environmental Protection

Proposed Regulation Concerning

Municipal Waste Combustors

eRegulations System Tracking Number **PR2015-192**

I hereby certify the following:

(1) The above-referenced **technical amendment regulation** is proposed pursuant to the following statutory authority or authorities: **CGS Section 22a-174.**

For technical amendment regulations proposed without a comment period, complete #2 below, then skip to #8.

(2) As permitted by Section 4-168(h) of the *Connecticut General Statutes*, the agency elected to proceed without prior notice or hearing and posted the text of the proposed technical amendment regulation on eRegulations System website on **<<select and enter the date of posting>>**.

For all other non-emergency proposed regulations, complete #3 - #7 below, then complete #8)

(3) The agency posted notice of intent with a specified comment period of not less than 30 days to the eRegulations System website on **January 20, 2016**.

(4) *(Complete one)* ☐ No public hearing held or was required to be held. **OR** ☒ One or more public hearings were held on: **February 24, 2016**.

(5) The agency posted notice of decision to move forward with the proposed regulation to the eRegulations System website on **April 6, 2016**.

(6) *(Complete one)* ☐ No comments were received. **OR** ☒ Comments were received and the agency posted the statements specified in subdivisions (2) and (3) of CGS Section 4-168(e) to the eRegulations System website on **April 6, 2016**.

(7) The final wording of the proposed regulation was posted to the eRegulations System website on **April 18, 2016**.

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(8) Subsequent to approval for legal sufficiency by the Attorney General and approval by the Legislative Regulation Review Committee, **the final regulation shall be effective**

(Check one and complete as applicable)

☒ When posted to the eRegulations System website by the Secretary of the State.

OR ☐ On _____

(Date must be a specific calendar date not less than 11 days after submission to the Secretary of the State)

SIGNED	Commissioner	4/15/16
(Head of Board, Agency or Commission, or duly authorized deputy)	OFFICIAL TITLE	DATE

Connecticut eRegulations System — Tracking Number PR2015-192 — Posted 5/6/2016

OFFICE OF THE ATTORNEY GENERAL
REGULATION CERTIFICATION

Agency Department of Energy & Environmental Protection

***REGULATION NUMBER* PR2015-192**

This Regulation is hereby APPROVED by the Attorney General as to legal sufficiency in accordance with Connecticut General Statutes Section 4-169.

DATE: 5/5/2016

Signed:_____
Robert W. Clark, Special Counsel
Duly Authorized

eRegulations.ct.gov

Connecticut eRegulations System — Tracking Number PR2015-192 — Posted 7/27/2016

The Connecticut General Assembly

Legislative Regulation Review Committee

Senator Clark Chapin
Senate Chair

Representative Brian Becker
House Chair

Official Record of Committee Action

July 26, 2016

Agency:	Department of Energy & Environmental Protection
Description:	Municipal Waste Combustors
LRRC Regulation Number:	2016-014
eRegulation Tracking Number:	PR2015-192

The above-referenced regulation has been

Approved with Technical Corrections

by the Legislative Regulation Review Committee in accordance
with CGS Section 4-170.

Kirstin L. Breiner
Committee Administrator

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State of Connecticut
Office of the Secretary of the State

Confirmation of Electronic Submission

Re: Regulation of the Department of Energy & Environmental Protection
concerning Municipal Waste Combustors
eRegulations System Tracking Number PR2015-192
Legislative Regulation Review Committee Docket Number 2016-014

The above-referenced regulation was electronically submitted to the Office of the Secretary of the State in accordance with Connecticut General Statutes Section 4-172 on August 2, 2016.

Said regulation is assigned Secretary of the State File Number 6223.

The effective date of this regulation is August 2, 2016.

Denise W. Merrill
Secretary of the State
August 2, 2016

By:

/s/ Kristin M. Karr
Kristin M. Karr
Administrative Law
Information Systems Manager

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