Commercial and Industrial Solid Waste Incinerator (CISWI) Rules
Final Reconsidered Rules Requirements Summary

Federal Regulations:

- 40 CFR 60 Subpart CCCC – NSPS for new/reconstructed/modified CISWI
- 40 CFR 60 Subpart DDDD – Emission Guidelines for existing CISWI
- Proposed changes to 2000 CISWI rules published 6/4/2010; final rules published 3/21/2011; reconsideration notice published on 5/18/2011.
- Proposed reconsideration rule published 12/23/2011.
- Final reconsidered rule published February 7, 2013
- Info at http://epa.gov/airquality/combustion/actions.html

Affected Sources [§§ 60.2010; 60.2505, and 40 CFR 241]**:**

- The incineration unit is subject to NSPS Subpart CCCC if each of the following apply:
    - It is a new incineration unit as defined in §60.2015: CISWI that commenced construction after June 4, 2010 or commenced reconstruction or modification 6 months after publication of this final rule in the Federal Register.
    - It is a CISWI unit as defined in §60.2265.
    - It is not exempt under §60.2020.
- Subpart CCCC does not affect existing units where physical or operational changes must be made in order to comply with Subpart DDDD emission guidelines. [*§ 60.2015(b)*]
- Solid waste incineration units at commercial and industrial facilities, including incinerators; small remote incinerators; ERUs - energy recovery units (boilers); Waste-burning kilns. The final rule also includes three subcategories of ERUs and separate CO limits for two subcategories of waste-burning kilns.
- Other key information regarding affected sources:
    - CISWI units burning agricultural materials that meet the definition of solid waste are part of the appropriate standards under this proposed rule.
    - Energy Recovery Units that combust solid waste (these units would be boilers and process heaters if they did not combust solid waste).
    - If the unit does not recover energy, it would be included in either the incinerators subcategory or the small, remote incinerators subcategory.
    - Units that cease combusting solid waste remain subject to CISWI for at least 6 months after solid waste is last added to the combustion chamber. [*§§60.2265, 60.2875*]

Exemptions [§§ 60.2020; 60.2555]**:**

- Qualifying small power producers, qualifying cogeneration units and metals recovery units are expressly exempt from coverage pursuant to CAA exclusions from the definition of “solid waste incineration unit” set forth in Section 129(g)(1).
- Units that are required to have a permit under section 3005 of the Solid Waste Disposal Act (i.e., hazardous waste combustion units) are exempt from Section 129 rules per CAA Section 129(g)(1).
- Solid waste incineration units that are included within the scope of other CAA Section 129 categories include municipal waste combustors, pathological waste incinerators (EPA intends to regulate these units under other solid waste incineration (OSWI) standards), sewage treatment plants, sewage sludge incinerators, and hospital/medical/infectious waste incinerators, and these solid waste incineration units remain exempt from the CISWI standards.

- Materials recovery units. Units that combust waste for the primary purpose of recovering metals (e.g., primary and secondary smelters.)
- Burn-off ovens (any rack reclamation unit, part reclamation unit, or drum reclamation unit) are exempted by definition.
- Cyclonic burn barrels (units consisting of a lid that fits onto and encloses an open-headed 55 gallon drum and that include and a blower that forces combustion air into the drum in a cyclonic manner to enhance the mixing of waste material and air) are exempted by definition.
- Laboratory analysis units (units that burn samples of materials for the purpose of chemical or physical analyses) are exempted by definition.
- Chemical recovery units (units that burn materials to recover chemical constituents or to produce chemical compounds where there is an existing commercial market for the recovered compounds) are exempted by definition.
- Foundry sand thermal reclamation units (units that remove coatings that are on foundry sand) are excluded by definition.
- Soil treatment units (units that thermally treat petroleum-contaminated soils for the sole purpose of remediation) are exempted by definition.
- Space heaters (units that meet the requirements of 40 CFR 279.23) are exempted by definition.
- Other solid waste incineration units: Incineration units that are subject to subpart 40 CFR 60, subpart EEEE (Standards of Performance for Other Solid Waste Incineration Units) or subpart FFFF (Emission Guidelines and Compliance Times for Other Solid Waste Incineration Units).
- Air curtain incinerators that burn 100 percent wood waste, 100 percent clean lumber, or 100 percent mixture of only wood waste, clean lumber, and/or yard waste are only required to meet the opacity limits and requirements under “Air Curtain Incinerators” in §§60.2245 through 60.2260.

Important Definitions [§§ 60.2265; 60.2875]**:**

- The RCRA definition of solid waste is integral in defining the CISWI source category. The EPA defines non-hazardous secondary materials (NHSM) that are solid waste under RCRA in the final “Identification of NHSM that are Solid Waste” Rulemaking. In an action parallel to the March 21, 2011, final CISWI rule, the EPA promulgated a final rule that identifies whether NHSMs are or are not solid waste when used as fuels or ingredients in combustion units. That action, often referred to as the “2011 NHSM final rule,” is relevant to the final CISWI rule because some ERUs and waste-burning kilns combust secondary materials that are solid waste. Commercial and industrial units that combust solid waste are subject to the CISWI standards issued pursuant to CAA section 129, rather than to standards issued pursuant to CAA section 112 that would otherwise be applicable to such units (e.g., units that would be boilers, process heaters, or cement kilns if they were not combusting solid waste).

- Commercial and industrial solid waste incineration (CISWI) unit means any distinct operating unit of any commercial or industrial facility that combusts, or has combusted in the preceding 6 months, any solid waste as that term is defined in 40 CFR 241. If the operating unit burns materials other than traditional fuels as defined in §241.2 that have been discarded, and you do not keep and produce records as required by §60.2740(v), the operating unit is a CISWI unit. While not all CISWI units will include all of the following components, a CISWI unit includes, but is not limited to, the solid waste feed system, grate system, flue gas system, waste heat recovery equipment, if any, and

bottom ash system. The CISWI unit does not include air pollution control equipment or the stack. The CISWI unit boundary starts at the solid waste hopper (if applicable) and extends through two areas: the combustion unit flue gas system, which ends immediately after the last combustion chamber or after the waste heat recovery equipment, if any; and the combustion unit bottom ash system, which ends at the truck loading station or similar equipment that transfers the ash to final disposal. The CISWI unit includes all ash handling systems connected to the bottom ash handling system.

- Contained gaseous material means gases that are in a container when that container is combusted.

- Deviation means any instance in which an affected source subject to this subpart, or an owner or operator of such a source:
    - Fails to meet any requirement or obligation established by this subpart, including but not limited to any emission limitation, operating limit, or operator qualification and accessibility requirements.
    - Fails to meet any term or condition that is adopted to implement an applicable requirement in this subpart and that is included in the operating permit for any affected source required to obtain such a permit.

- Energy recovery unit means a combustion unit combusting solid waste (as that term is defined by the Administrator in 40 CFR 241) for energy recovery. Energy recovery units include units that would be considered boilers and process heaters if they did not combust solid waste.

- Energy recovery unit designed to burn biomass (Biomass) means an energy recovery unit that burns solid waste, biomass, and non-coal solid materials but less than 10% coal, on a heat input basis on an annual average, either alone or in combination with liquid waste, liquid fuel or gaseous fuels.

- Energy recovery unit designed to burn coal (Coal) means an energy recovery unit that burns solid waste and at least 10 percent coal on a heat input basis on an annual average, either alone or in combination with liquid waste, liquid fuel, or gaseous fuels.

- Energy recovery unit designed to burn liquid waste material and gas (Liquid/gas) means an energy recovery unit that burns a liquid waste with liquid or gaseous fuels not combined with any solid fuel or waste materials.

- Energy recovery unit designed to burn solid materials (Solids) includes energy recovery units designed to burn coal and energy recovery units designed to burn biomass.

- Incinerator means any furnace used in the process of combusting solid waste (as that term is defined by the Administrator in 40 CFR 241) for the purpose of reducing the volume of the waste by removing combustible matter. Incinerator designs include single chamber and two-chamber.

- Kiln means an oven or furnace, including any associated preheater or precalciner devices, used for processing a substance by burning, firing or drying. Kilns include cement kilns that produce clinker by heating limestone and other materials for subsequent production of Portland Cement.

- Load fraction means the actual heat input of an energy recovery unit divided by heat input during the performance test that established the minimum sorbent injection rate or minimum activated carbon injection rate, expressed as a fraction (e.g., for 50 percent load, the load fraction is 0.5).

- Municipal solid waste or municipal-type solid waste means household, commercial/retail, or institutional waste. Household, commercial/retail, and institutional waste does include yard waste and refuse-derived fuel. Household, commercial/retail, and institutional waste does not include used oil; sewage sludge; wood pallets; construction, renovation, and demolition wastes (which include railroad ties and telephone poles); clean wood; industrial process or manufacturing wastes; medical waste; or motor vehicles (including motor vehicle parts or vehicle fluff).

- Small, remote incinerator means an incinerator that combusts solid waste (as that term is defined by the Administrator in 40 CFR 241) and combusts 3 tons per day or less solid waste and is more than 25 miles driving distance to the nearest municipal solid waste landfill.

- Solid waste means the term solid waste as defined in 40 CFR 241.2.

- Solid waste incineration unit means a distinct operating unit of any facility which combusts any solid (as that term is defined by the Administrator in 40 CFR part 241) waste material from commercial or industrial establishments or the general public (including single and multiple residences, hotels and motels). Such term does not include incinerators or other units required to have a permit under section 3005 of the Solid Waste Disposal Act. The term "solid waste incineration unit" does not include:
    1) Materials recovery facilities (including primary or secondary smelters) which combust waste for the primary purpose of recovering metals,
    2) Qualifying small power production facilities, as defined in section 3(17)(C) of the Federal Power Act (16 U.S.C. 769(17)(C)), or qualifying cogeneration facilities, as defined in section 3(18)(B) of the Federal Power Act (16 U.S.C. 796(18)(B)), which burn homogeneous waste[1] (such as units which burn tires or used oil, but not including refuse-derived fuel) for the production of electric energy or in the case of qualifying cogeneration facilities which burn homogeneous waste for the production of electric energy and steam or forms of useful energy (such as heat) which are used for industrial, commercial, heating or cooling purposes, or
    3) Air curtain incinerators provided that such incinerators only burn wood wastes, yard wastes and clean lumber and that such air curtain incinerators comply with opacity limitations to be established by the Administrator by rule.

- Waste-burning kiln means a kiln that is heated, in whole or in part, by combusting solid waste (as that term is defined by the Administrator in 40 CFR 241). Secondary materials used in Portland cement kilns shall not be deemed to be combusted unless they are introduced into the flame zone in the hot end of the kiln or mixed with the precalciner fuel.

[1] The final rule does not include a definition of homogeneous waste. The final also removes the requirement that qualifying small power producers and qualifying cogeneration facilities that combust solid waste obtain a determination from EPA that such waste is homogenous. Instead, the final rule requires qualifying small power producers and qualifying cogeneration facilities that combust solid waste notify the EPA that such waste is homogeneous. [*§§60.2020(e)(3),(f)(3); 60.2555(e)(3),(f)(3)*]

Emission Limits (New/Reconstructed/Modified CISWI Units – NSPS Subpart CCCC):

A CISWI is subject to NSPS CCCC if it commenced construction after June 4, 2010 or commenced reconstruction or modification after August 7, 2013 (the date 6 months after the date of publication of the final rule in the Federal Register). New CISWI units must conduct **an initial performance test** to show compliance with the emission limits **within 60 days** after the unit reaches the charge rate at which it will operate, **but no later than 180 days** after the unit's initial startup. Table 1 (attached) presents the final emission limits for new sources and compares them against the limits previously promulgated in March 2011. These emission limits apply at all times, including periods of startup, shutdown, or malfunction (CEMS data are not corrected for O_2 during startup and shutdown). *[§§60.2015, 60.2140]*

Emission Limits (Existing CISWI Units – Subpart DDDD):

A CISWI subject to DDDD must meet the emission limits by the final compliance date under the approved state plan, federal plan, or delegation, as applicable [3 years after the final state plan is approved but no later than February 7, 2018 (5 years from publication of this final rule in the Federal Register)]. Table 2 (attached) presents the final emission limits for existing sources and compares them against the limits previously promulgated in March 2011. These emission limits apply at all times, including periods of startup, shutdown, or malfunction (CEMS data are not corrected for O_2 during startup and shutdown). *[§§60.2535, 60.2705]*

Operating Limits [§§ 60.2110; 60.2675]**:**

The rule requires the following operating limits, based on the type of air pollution control device installed. Use 3-hour block average values to determine compliance (except for baghouse leak detection system alarms) unless a different averaging period is established under §60.2115 or, for energy recovery units, where the averaging time for each operating parameter is a 30-day rolling, calculated each hour as the average of the previous 720 operating hours. Operation above the established maximum, below the established minimum, or outside the allowable range of operating limits constitutes a deviation from your operating limits, except during performance tests conducted to determine compliance with the emission and operating limits or to establish new operating limits.

Air Pollution Control Device	**Required Operating Limits**
Wet Scrubber	Maximum Charge Rate Minimum Differential Pressure or amperage to scrubber Minimum Scrubber Liquor Flow Rate Minimum Scrubber Liquor pH
Dry Scrubber	Monitor the injection rate of each sorbent and maintain the 3-hour block averages at or above the operating limits established during the hydrogen chloride performance test.
ESP	Minimum secondary power to the ESP
Activated carbon Injection	Minimum sorbent feed rate For ERUs must also maintain records of the load fraction
Selective Non-Catalytic Reduction	Maximum charge Rate Minimum Secondary Chamber Temperature (if applicable) Reagent Feed Rate
Fabric Filter	Bag Leak Detection System must alarm <5% of time every six months
Other (not listed above)	Owner must petition EPA for limits and receive approval

Operating parameters / monitoring requirements are as follows [§§ 60.2110; 60.2730]:

Operating Parameter / Monitoring Requirement (by Control Device type	Pollutants Influenced by Operating Parameter	Alternative Monitoring Options
Maximum charge (feed) rate	All	None
Minimum dioxin/furans sorbent flow rate, adjusted by load fraction (Activated carbon injection)	Dioxin/furans	Integrated sorbent trap dioxin monitoring system (ISTDMS) and multi-metals CEMS, Hg CEMS or integrated sorbent trap mercury monitoring system (ISTMMS)
Minimum Hg sorbent flow rate, adjusted by load fraction (Activated carbon injection)	Hg	
Minimum HCl sorbent flow rate, adjusted by load fraction (Dry scrubbers, spray dryers or duct sorbent injection)	HCl	HCl CEMS
Minimum scrubber pressure drop / horsepower amperage (Wet scrubber)	PM, Cd, Pb, Hg	PM CEMS (for units in the coal or liquid/gas ERU or incinerator subcategories)
Minimum scrubber liquor flow rate (Wet scrubber)	HCl, PM, Cd, Pb, Hg, dioxin, furans	HCl CEMS, PM CEMS (for units in the coal or liquid/gas ERU or incinerator subcategories), multi-metals CEMS, ISTDMS and ISTMMS
Minimum scrubber liquor pH (Wet scrubber)	HCl	HCl CEMS
Minimum ESP secondary power	PM, Cd, Pb, Hg	PM CEMS (for units in the coal or liquid/gas ERU or incinerator subcategories)
Reagent flow rate and secondary chamber temperature (SNCR)	NOx	NOx CEMS
Air pollution control device inspections	All	None
Time of visible emissions from ash handling operations	PM	None
Bag Leak Detection System Alarm-Fabric Filters	PM	None

Notes:

- If you do not use a wet scrubber, electrostatic precipitator, or fabric filter to comply with the emission limitations, and if you do not determine compliance with your particulate matter emission limitation with a PM CEMS, you must maintain opacity to less than or equal to 10 percent opacity (1-hour block average).
- Maximum charge rate is 110 percent of the average (or daily for batch units) charge rate measured during the most recent performance test demonstrating compliance with all applicable emission limitations. Other minimum/maximum operating limits based on the lowest/highest 1-hour average value measured during the most recent performance test demonstrating compliance with all applicable emission limitations.

General Requirements for Testing/Monitoring by Compound [§§ 60.2135,2145; 60.2700,2710]:

Compound	Incinerators	Energy Recovery Units <250 MMBtu/hr	Energy Recovery Units ≥250 MMBtu/hr	Waste-burning Kilns	Small, Remote Incinerators
Cd	Annual Testing or CEMS	Annual Testing or CEMS	Annual Testing or CEMS	Annual Testing or CEMS	Annual Testing or CEMS

Compound	Incinerators	Energy Recovery Units <250 MMBtu/hr	Energy Recovery Units ≥250 MMBtu/hr	Waste-burning Kilns	Small, Remote Incinerators
CO	Annual Testing or CEMS	Annual Testing or CEMS	Annual Testing or CEMS	Annual Testing or CEMS	Annual Testing or CEMS
D/F	Annual Testing or CEMS	Annual Testing or CEMS	Annual Testing or CEMS	Annual Testing or CEMS	Annual Testing or CEMS
HCl	Annual Testing or CEMS	Annual Testing or CEMS	Annual Testing or CEMS	Annual Testing or CEMS	Annual Testing or CEMS
Pb	Annual Testing or CEMS	Annual Testing or CEMS	Annual Testing or CEMS	Annual Testing or CEMS	Annual Testing or CEMS
Hg	Annual Testing or CEMS	Annual Testing or CEMS	Annual Testing or CEMS	CEMS	Annual Testing or CEMS
NOx	Annual Testing or CEMS	Annual Testing or CEMS	Annual Testing or CEMS	Annual Testing or CEMS	Annual Testing or CEMS
PM	Annual Testing or CEMS	Annual Testing or CEMS (coal and liquid/gas)	PM CPMS or PM CEMS (coal and liquid/gas)	PM CPMS	Annual Testing or PM CEMS
SO2	Annual Testing or CEMS	Annual Testing or CEMS	Annual Testing or CEMS	Annual Testing or CEMS	Annual Testing or CEMS
Fug. Ash	Annual VE Testing	Annual VE Testing	Annual VE Testing	NA	Annual VE Testing

Additional Monitoring / Continuous Compliance Requirements [§§ 60.2165; 60.2730]**:**

- To ensure compliance with the emission limits, the final rule establishes stack testing and continuous monitoring requirements. The rule allows sources to use CEMS if an owner or operator chooses to do so (PM CEMS are limited to coal and liquid/gas ERUs, incinerators, and small remote incinerators). Continuous parameters and emissions levels (if used) are measured as either a 3-hour block or a 30-day rolling average basis, depending on the parameter being measured and the subcategory of CISWI.
- Monitoring requirements allow uncorrected CEMS readings to be used during startup and shutdown. CEMS data during startup and shutdown means the following:
    - For incinerators, small remote incinerators, and energy recovery units: CEMS data collected during the first hours of a CISWI unit startup from a cold start until waste is fed to the unit and the hours of operation following the cessation of waste material being fed to the CISWI unit during a unit shutdown. For each startup event, the length of time that CEMS data may be claimed as being CEMS data during startup must be 48 operating hours or less. For each shutdown event, the length of time that CEMS data may be claimed as being CEMS data during shutdown must be 24 operating hours or less.
    - For waste-burning kilns: CEMS data collected during the periods of kiln operation that do not include normal operations. Startup begins when the kiln's induced fan

is turned on and continues until continuous feed is introduced into the kiln, at which time the kiln is in normal operating mode. Shutdown begins when feed to the kiln is halted.

- If using a **fabric filter** to comply, you must install and operate a bag leak detection system with an alarm such that the bag leak detection system alarm **does not sound more than 5%** of the operating time during a 6-month period. Each bag leak detection system must be installed, operated, calibrated, and maintained in a manner consistent with the manufacturer's specifications and recommendations and specifications of §60.2165(b).
- If using a **wet scrubber** to comply, continuously monitor the following operating parameters if not using CEMS: pressure drop across the wet scrubber (or amperage), scrubber liquid flow rate, and pH.
- If using an **ESP** to comply, continuously monitor the following operating parameters: voltage and secondary current to calculate total secondary power input.
- If using an **SNCR** to comply, continuously monitor the following operating parameters: reagent injection rate (e.g., ammonia or urea) and secondary chamber temperature (if applicable to the unit).
- If using **carbon injection or dry sorbent injection** to comply, continuously monitor the following operating parameters: sorbent injection rate.
- If you use an air pollution control device **other than a wet scrubber, activated carbon injection, selective non-catalytic reduction, or an electrostatic precipitator or limit emissions in some other manner** to comply with the emission limitations under §60.2670, you must petition the Administrator for specific operating limits to be established during the initial performance test and continuously monitored thereafter. (For more details on the required components of the petition see §60.2115).
- Annual inspections of scrubbers, fabric filters, and other air pollution control devices that may be used to meet the emission limits.
- Facilities using a CEMS to demonstrate continuous compliance with any of the emission limits of this subpart must complete the following:
    - Demonstrate compliance with the appropriate emission limit(s) using a 24-hour block average, calculated following the procedures in EPA Method 19 of appendix A-7 of part 60.
    - Operate all continuous emissions monitoring systems in accordance with the applicable procedures under appendices B and F of part 60.
- Monitoring of bypass stack use if installed at an affected unit. Use of a bypass stack at any time is an emissions standards deviation for particulate matter, HCl, Pb, Cd, and Hg.
- Conduct annual performance tests (where appropriate) for PM and HCl emissions, fugitives from ash handling, and opacity. (If demonstrate that the unit is less than 75% of the limit for 3 consecutive years, performance testing frequency reduces to every 3 years.)
- Annual visual emissions observation (Method 22) for ash handling operations (for all subcategories except waste-burning kilns).
- Operate monitoring systems per a site-specific monitoring plan.

Recordkeeping and Reporting Requirements [§§ 60.2175-2240; 60.2740-2800]**:**

Maintain for **5 years** records of the initial performance tests and all subsequent performance tests, operating parameters, quality and type of waste burned, any maintenance, the siting analysis, and operator training and qualification. (See §60.2175 or §60.2740 for specific details)

Summary of the **key reporting requirements**:

Report	Due date	Contents
Startup notification for new units	Prior to initial startup	• Type of waste to be burned • Max design waste burning capacity • Anticipated maximum charge rate
Initial test report	No later than 60 days following the initial performance test	• Complete test report for the initial performance test • The values for the site-specific operating limits • Installation of bag leak detection system for fabric filter
Annual report	No later than 12 months following the submission of the initial test report. Subsequent reports are to be submitted no more than 12 months following the previous report	• Name and address • Statement and signature by responsible official • Date of report • Values for the operating limits • Highest recorded 3- hour average and the lowest 3-hour average, as applicable, for each operating parameter recorded for the calendar year being reported • If a performance test was conducted during the reporting period, the results of the test • If a performance test was not conducted during the reporting period, a statement that the requirements of §60.2155(a) (for new sources) or §60.2720(a) (for existing sources) were met • Documentation of periods when all qualified CISWI unit operators were unavailable for more than 8 hours but less than 2 weeks • If you are conducting performance tests once every 3 years consistent with §60.2155(a),(b) or §60.2720(a) the date of the last 2 performance tests, a comparison of the emission level you achieved in the last 2 performance tests to the 75 percent emission limit threshold and a statement as to whether there have been any operational changes since the last performance test that could increase emissions.
Emission limitation or operating limit deviation report	By August 1 of that year for data collected during the first half of the calendar year. By February 1 of the following year for data collected during the second half of the calendar year	• Dates and times of deviations • Averaged and recorded data for those dates • Duration and causes of each deviation and the corrective actions taken • Copy of operating limit monitoring data and any test reports • Dates, times, and causes for monitor downtime incidents

Requirements prior to construction of new CISWI unit [§ 60.2190]**:**

You must submit a notification prior to commencing construction that includes the following:
(a) A statement of intent to construct.
(b) The anticipated date of commencement of construction.
(c) All documentation produced as a result of the siting requirements of §60.2050 (see below).
(d) The waste management plan as specified in §§60.2055 through 60.2065 (see below).

(e) Anticipated date of initial startup.

Siting Analysis *[§§ 60.2045, 60.2050]*
Submit a report that evaluates site-specific air pollution control alternatives that minimize potential risks to public health or the environment, considering costs, energy impacts, non-air environmental impacts, or any other factors related to the practicability of the alternatives.

Waste Management Plan *[§§ 60.2055-2065; 60.2620-2630]*
Submit a plan that identifies both the feasibility and the methods used to reduce or separate certain components of solid waste from the waste stream to reduce or eliminate toxic emissions from incinerated waste. The plan must include consideration of the reduction or separation of waste-stream elements such as paper, cardboard, plastics, glass, batteries, or metals; or the use of recyclable materials.

Operator Training and Qualification Requirements[§§ 60.2070-2100; 60.2635-2665]**:**

- Qualify operators by ensuring that they complete an operator training course and annual refresher review course.
- The CISWI unit cannot be operated unless a fully trained and qualified CISWI unit operator is accessible, either at the facility or can be at the facility within 1 hour. The trained and qualified CISWI unit operator may operate the CISWI unit directly or be the direct supervisor of one or more other plant personnel who operate the unit.
- The operator training course must be completed within 6 months of the CISWI unit startup. (Further details on the CISWI operator training/qualification requirements are given in §60.2070 through 60.2100 or §60.2635 through 60.2665.)

Comparison of 2011 Final and 2013 Final Emission Limits for Existing Incinerators and ERUs

40 CFR 60, Subpart DDDD

Pollutant (units) [1]	Incinerators	Incinerators			Energy Recovery Units								
	(2000 CISWI limit)	3/21/11 FR Final	2/7/13 Final	% Increase (3/11 vs. 2/13)	3/21/11 FR Final			2/7/13 Final			% Increase (3/11 vs. 2/13)		
					Biomass	Coal	Liq/Gas	Biomass	Coal	Liq/Gas	Biomass	Coal	Liq/Gas
CO (ppmv)	157	36	17	-53%	490	59	36	260	95	35	-47%	61%	-3%
NO_X (ppmv)	388	53	53	--	290	340	76	290	340	76	--	--	--
SO_2 (ppmv)	20	11	11	--	6.2	650	720	7.3	650	720	18%	--	--
PM filterable (mg/dscm)	70	34	34	--	250	250	110	11	160	110	-96%	-36%	--
Fugitive Ash (% Visible Emissions)	no limit	5%	5%	--	5%	5%	5%	5%	5%	5%	--	--	--
Opacity (%)	10	no limit	no limit	--	no limit	no limit	no limit	no limit	no limit	no limit	--	--	--
Hg (mg/dscm)	0.47	0.0054	0.0048	-11%	0.00033	0.00033	0.0013	0.0022	0.0160	0.0024	567%	4748%	85%
Cd (mg/dscm)	0.004	0.0026	0.0026	--	0.00051	0.00051	0.023	0.0014	0.0095	0.023	175%	1763%	--
Pb (mg/dscm)	0.04	0.0036	0.015	317%	0.0036	0.0036	0.096	0.014	0.14	0.096	289%	3789%	--
HCl (ppmv)	62	29	29	--	0.45	0.45	14	0.20	13	14	-56%	2789%	--
Dioxin/Furans total (ng/dscm) OR	no limit	4.6	4.6	--	0.35	0.35	2.9	0.52	5.1	2.9	49%	1357%	--
Dioxin/Furans TEQ (ng/dscm)	0 .41	0.13	0.13	--	0.059	0.059	0.32	0.12	0.075	0.32	103%	27%	--

Comparison of 2011 Final and 2013 Final Emission Limits for New Incinerators and ERUs
40 CFR 60, Subpart CCCC

Pollutant (units) [1]	Incinerators	Incinerators			Energy Recovery Units								
	(2000 CISWI limit)	3/21/11 FR Final	2/7/13 Final	% Increase (3/11 vs. 2/13)	3/21/11 FR Final			2/7/13 Final			% Increase (3/11 vs. 2/13)		
					Biomass	Coal	Liq/Gas	Biomass	Coal	Liq/Gas	Biomass	Coal	Liq/Gas
CO (ppmv)	157	12	17	42%	160	46	36	240	95	35	50%	107%	-3%
NO_X (ppmv)	388	23	23	--	290	340	76	290	340	76	--	--	--
SO_2 (ppmv)	20	11	11	--	6.2	650	720	7.3	650	720	18%	--	--
PM- filterable (mg/dscm)	70	18	18	--	250	250	110	5.1	160	110	-98%	-36%	--
Fugitive Ash (% Visible Emissions)	no limit	5%	5%	--	5%	5%	5%	5%	5%	5%	--	--	--
Opacity (%)	10	no limit	no limit	--	no limit	no limit	no limit	no limit	no limit	no limit	--	--	--
Hg (mg/dscm)	0.47	0.00016	0.00084	425%	0.00033	0.00033	0.00025	0.0022	0.016	0.00056	567%	4748%	124%
Cd (mg/dscm)	0.004	0.0023	0.0023	--	0.00051	0.00051	0.023	0.0014	0.0095	0.023	175%	1763%	--
Pb (mg/dscm)	0.04	0.0019	0.015	689%	0.0031	0.0031	0.096	0.014	0.14	0.096	352%	4416%	--
HCl (ppmv)	62	0.091	0.091	--	0.45	0.45	14	0.20	13	14	-56%	2789%	--
Dioxin/Furans Total (ng/dscm) OR	no limit	0.052	0.58	1015%	0.068	0.068	no limit	0.52	5.1	no limit	665%	7400%	--
Dioxin/Furans TEQ (ng/dscm)	0 .41	0.13	0.13	--	0.011	0.011	0.002	0.076	0.075	0.093	591%	582%	4550%

[1] All emission limits are measured at 7% oxygen.

ppmv = parts per million by volume.

mg/dscm = milligrams per dry standard cubic meter.

ng/dscm = nanograms per dry standard cubic meter.

Comparison of Proposed, 2011 Final, and 2013 Final Emission Limits for Existing CISWI Units
40 CFR 60, Subpart DDDD

Pollutant (units)[1]	Waste-Burning Kilns				Small, Remote Incinerators			
	6/4/10 FR Proposed	3/21/11 FR Final	2/7/13 Final	% Increase (3/11 vs. 2/13)	6/4/10 FR Proposed	3/21/11 FR Final	2/7/13 Final	% Increase (3/11 vs. 2/13)
CO (ppmv)	710	110	110/790	9%/273%	78	20	64	220%
NO_X (ppmv)	1100	540	630	17%	210	240	190	-21%
SO_2 (ppmv)	410	38	600	1479%	44	420	150	-64%
PM filterable (mg/dscm)	60	6.2	4.6	-26%	240	230	270	17%
Fugitive Ash (% Visible Emissions)	no limit	no limit	no limit	--	no limit	5%	5%	--
Opacity (%)	4	no limit	no limit	--	13	no limit	no limit	--
Hg (mg/dscm)	0.024	0.0079	0.011	39%	0.0029	0.0057	0.0053	-7%
Cd (mg/dscm)	0.00030	0.00048	0.0014	192%	0.26	0.61	0.95	56%
Pb (mg/dscm)	0.0027	0.0026	0.014	438%	1.4	2.7	2.1	-22%
HCl (ppmv)	1.5	25	3.0	-88%	150	220	300	36%
Dioxin/Furans total (ng/dscm) OR	2.1	0.20	1.3	550%	1600	1200	4400	267%
Dioxin/Furans TEQ (ng/dscm)	0.17	0.0070	0.075	971%	130	57	180	216%

Comparison of Proposed, 2011 Final, and 2013 Final Emission Limits for New CISWI Units 40 CFR 60, Subpart CCCC

Pollutant (units) [1]	Waste-Burning Kilns				Small, Remote Incinerators			
	6/4/10 FR Proposed	3/21/11 FR Final	2/7/13 Final	% Increase (3/11 vs. 2/13)	6/4/10 FR Proposed	3/21/11 FR Final	2/7/13 Final	% Increase (3/11 vs. 2/13)
CO (ppmv)	36	90	90/190	--/256%	4	12	13	8%
NO_X (ppmv)	140	200	200	--	210	78	170	118%
SO_2 (ppmv)	3.6	38	28	-26%	43	1.2	1.2	--
PM- filterable (mg/dscm)	1.8	2.5	2.2	-12%	240	230	270	17%
Fugitive Ash (% Visible Emissions)		no limit	no limit	--		5%	5%	--
Opacity (%)	1	no limit	no limit	--	13	no limit	no limit	--
Hg (mg/dscm)	0.024	0.0062	0.0037	-40%	0.0013	0.0035	0.0035	--
Cd (mg/dscm)	0.0003	0.00048	0.0014	192%	0.057	0.61	0.67	10%
Pb (mg/dscm)	0.00078	0.0026	0.014	438%	1.4	0.26	2	669%
HCl (ppmv)	1.5	3.0	3.0	--	150	200	200	--
Dioxin/Furans Total (ng/dscm) OR	0.00035	0.090	0.51	467%	1200	1200	1800	50%
Dioxin/Furans TEQ (ng/dscm)	0.000028	0.0030	0.075	2400%	94	31	31	--