ENVIRONMENTAL MANAGEMENT COMMISSION

REGULATORY IMPACT ANALYSIS FOR AMENDMENTS CONCERNING COMMERCIAL AND INDUSTRIAL SOLID WASTE INCINERATORS (CISWI) UNITS

Rule Adoptions: **No**

Rule Amendments / Readoption: 15A NCAC 02D .1210

Rule Repeals: **No**

Rule Topic: Commercial and Industrial Solid Waste Incineration (CISWI)

NCDEQ Division: Department of Environmental Quality, Division of Air Quality

Agency Contact: Steve Hall, Acting Rules Development Branch Supervisor
Division of Air Quality (DAQ)
(919) 707-8404
steve.hall@ncdenr.gov

Analyst: Paula Hemmer
Division of Air Quality (DAQ)
(919) 707-8708
paula.hemmer@ncdenr.gov

Impact Summary:

State government:	Minimal
Local government:	No
Private impact:	Moderate
Substantial impact:	No

Statutory Authority: G.S. 143-215.3(a)(1); 143-215.65; 143-215.66; 143-215.107(a)(4), (5); 40 CFR 60.215(a)(4).

Necessity: To incorporate requirements for Commercial and Industrial Solid Waste Incineration units consistent with the Emission Guidelines in 40 CFR Part 60 Subpart DDDD that are effective on February 18, 2018 and to readopt 02D .1210 in accordance with Session Law (S.L.) 2013-413 and G.S. 150B-21.3A.

I. Executive Summary

The State of North Carolina, Department of Environmental Quality (NCDEQ), Division of Air Quality (DAQ) is proposing amendments to 15A NCAC 02D .1210 reflecting the State's approach to the revision of the emissions guidelines (EG) for commercial and industrial solid waste incineration (CISWI) units pursuant to 40 CFR Part 60 Subpart DDDD Emissions Guidelines and Compliance Times for Commercial and Industrial Solid Waste Incineration Units

published by the U.S. Environmental Protection Agency (EPA) on June 23, 2016.[1] The DAQ is also proposing to readopt Rule .1210 in accordance with the requirements outlined in S.L. 2013-413 and G.S. 150-B-21.3A.

The revised EG originally published in March 21, 2011 and the final notice of reconsideration of the guidelines published on June 23, 2016 include several key changes.[2] First, the new rule expands the definition of a CISWI unit to include "energy recovery units" (such as boilers and process heaters), kilns, and small remote incinerators (such as air curtain burners) that burn materials meeting the definition of a solid waste under the revised 40 CFR 241 Solid Wastes Used as Fuels or Ingredients in Combustion Units. Second, it creates several categories of energy recovery units and incinerators with corresponding emissions limits. Third, it lowers the emissions standards for the currently regulated incinerators. Lastly, air curtain burners that fire certain types of clean biomass are only subject to a subset of requirements under 40 CFR Subpart DDDD, including obtaining an air quality permit, annual opacity measurements, and recordkeeping and reporting requirements.

There are currently no combustion units operating in North Carolina that meet the definition of a CISWI unit under the previous EG promulgated in 2000[3]. Since the proposed rule extends the definition of a CISWI unit, the DAQ reviewed its permitted facilities to identify boilers, process heaters and kilns that fire waste materials. The DAQ identified four combustion units operating in North Carolina that currently fire a fuel stream that could be considered a solid waste pursuant to 40 CFR 241. In addition, the DAQ identified approximately ten facilities that operate combustion units that are <u>not</u> firing solid waste but would require a modification to the fuel stream description listed in the permit. Lastly, there are seven commercial air curtain burners permitted to burn clean biomass that are affected by this rule. Note the DAQ is addressing air curtain burners in 15A NCAC 02D .1904 Air Curtain Burners and these sources will not be part of this fiscal analysis.

There are three different compliance pathways for the four affected combustion units:

1. Install air pollution control equipment and comply with rule requirements,
2. Cease firing the waste fuel stream and dispose of it using an alternative method, or
3. Obtain a determination that the fuel stream is not a solid waste.

The DAQ estimated the costs to the facility owners and operators under each of the compliance pathways. The DAQ then developed the most likely regulatory outcome for each affected combustion unit based on the least-cost compliance pathway and unit-specific information on the fuel stream of concern.

Under the most likely outcome developed by DAQ, two affected facilities obtain determinations that the fuel being fired is not a solid waste pursuant to 40 CFR 241. These two facilities would have minimal costs in the first year of the rule, totaling approximately $10,000, to obtain the determinations and no costs in subsequent years because they are no longer affected facilities.

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[1] Federal Register Vol. 81, No. 121, Thursday, June 23, 2016, pp 40956-41034

[2] Federal Register Vol. 76, No. 54, Monday, March 21, 2011, pp 15704- 15790

[3] Federal Register Vol. 65, No. 232, December 1, 2000 pp 75338-75376

The remaining two facilities are assumed to landfill the waste and incur costs of approximately $132,000 annually. In addition, ten facilities would modify their permits to remove waste fuel streams that are no longer fired. This set of outcomes has a net impact (costs minus benefits) of $589,000 over the ten-year period analyzed. Using the definition of "substantial economic impact" under NC General Statute 150B-21.4, the fiscal analysis indicates that amending the rule would not cause a substantial economic impact to North Carolina.[4]

Given the uncertainty surrounding the affected facilities' response to the rules, the DAQ performed a sensitivity analysis of the different compliance pathways on the net fiscal impact. The DAQ assessed two different outcomes to estimate the range of costs and benefits. Under the first potential outcome, two facilities would opt to install and operate air pollution control equipment. The total installed cost of the controls is approximately $4.0 million and annual costs are approximately $1.3 million. Under the second potential outcome, all four affected facilities would dispose of the waste via landfill. The total annual cost to the facilities was estimated to be $1.1 million dollars. Therefore, the net fiscal impact of the amended rule is sensitive to the compliance pathway chosen by each affected facility. Table 1 is a summary of the net fiscal impacts from the mostly likely regulatory outcome and the two outcomes used for the sensitivity analysis.

Table 1. Summary of Regulatory Outcomes and the Associated Net Fiscal Impacts

Actions	Most Likely Regulatory Outcome	Potential Regulatory Outcome 1	Potential Regulatory Outcome 2
CISWI Affected Units Installing Controls		Wilsonart Sanford-Statesville	
CISWI Affected Units Disposing of Waste	Weyerhaeuser-Grifton Sanford-Statesville	Jackson Paper Weyerhaeuser -Grifton	Jackson Paper Weyerhaeuser -Grifton Sanford-Statesville Wilsonart
CISWI Affected Units Obtaining Determination	Wilsonart Jackson Paper		
Non-CISWI Affected Units	10 Non-Affected Units	10 Non-Affected Units	10 Non-Affected Units
Net Impact, Present Value (2017$)	**$588,982**	**$8,280,723**	**$1,536,711**

There are minimal fiscal impacts from the proposed amendments to state government. The net costs of modifying permits and performing tasks related to the rule are estimated at zero cost to the DAQ under all three scenarios due to the collection of permit modification fees. None of the affected units were located in the jurisdictions of the local air quality programs. Therefore, these programs are not directly affected by the proposed amendments. Any administrative costs to adopt administrative rules that mirror the state rules are minimal.

[4] "Substantial economic impact" is defined in General Statute 150B-21.4 as an aggregate financial impact on all affected persons of at least one million dollars ($1,000,000) in a 12-month period.

The estimated human health benefits from the reduction in emissions of particulate matter less than 2.5 microns in size ($PM_{2.5}$) under the most likely regulatory outcome are less than $24,000 dollars annually. This outcome has minimal human health benefits since two of the affected combustion units continue to operate as they did prior to the rule change.

II. Certificate of Federal Requirement

Section 129 of the Clean Air Act (CAA), titled, "Solid Waste Combustion," requires the EPA to develop and adopt standards for solid waste incineration units pursuant to CAA sections 111 and 129.

On March 21, 2011, the United States Environmental Protection Agency (EPA) promulgated revisions to the New Source Performance Standards (NSPS) and Emissions Guidelines for Commercial and Industrial Solid Waste Incineration (CISWI) Units. Following this action, the EPA received petitions for reconsideration that identified certain issues that warranted consideration. In response, the EPA reconsidered and requested comment on several provisions of the final rules. The EPA published the proposed revisions to the NSPS and EG for CISWI units on December 23, 2011 and promulgated the final reconsidered NSPS and EG on February 7, 2013. However, the EPA then received additional petitions for reconsideration that required action on the part of EPA. On June 23, 2016, the EPA promulgated the amended NSPS and EG for CISWI units.

The NSPS are federal regulations directly enforceable upon CISWI units and become effective six months after promulgation under section 129 of the Clean Air Act. The EG, however, are not directly enforceable and are implemented and enforced under either a state plan or an EPA federal plan. A state has the option of either taking delegation of the federal plan or submitting a state plan to replace the federal plan. A state plan must be at least as protective as the EG. States are required to submit state plans to the EPA for approval within 1 year following promulgation of the EG. For this rulemaking, the date for state plan submission was February 7, 2014. (Note the rule was under reconsideration on that date.) The EPA will issue a federal plan for states that do not have an approved state plan. States with no affected emissions sources located in their state submit a "negative declaration" to the EPA in lieu of a state plan.

Within two years of promulgation of an EG, the Clean Air Act requires the EPA to develop, implement, and enforce a federal plan for existing CISWI units in states that have not submitted a state plan to EPA. On January 11, 2017, the EPA published its proposed federal plan, 40 CFR Part 62, Subpart III Federal Plan Requirements for Commercial and Industrial Solid Waste Incineration Units That Commenced Construction On or Before November 30, 1999, which is applicable to states with existing CISWI units that do not have an approved state plan.[5]

III. Existing Rules

Existing CISWI requirements are found in 15A NCAC 02D .1210 Commercial and Industrial Solid Waste Incineration Units, and the history note reveals that this rule was originally adopted

[5] Federal Register Vol. 82, No. 7, January 11, 2017 pp 3554- 3599

and became effective on August 1, 2002. Amendments to the original rule became effective on January 1, 2005 and June 1, 2008.

There are currently no combustion units operating in the State of North Carolina that meet the definition of a CISWI unit under the previous CISWI EG promulgated by EPA on December 1, 2000.[6]

IV. Proposed Rules

North Carolina automatically adopts the revisions to the NSPS for new units. This is not true for the rules regulating existing units, which necessitates rulemaking to incorporate the EPA's EG requirements into the state rules. Therefore, the DAQ is amending15A NCAC 02D .1210 to incorporate the revised EG. The compliance date for all CISWI units is February 7, 2018.

The proposed amendments to North Carolina's existing rule incorporates all the federal plan requirements found in the EG that are applicable to existing CISWI units. The amended rule includes substantial revisions including revisions to 11 paragraphs, the deletion of 3 paragraphs and the addition of 4 paragraphs. The rule has also been amended to remove emissions standards, operational standards, monitoring requirements and to reference 40 CFR 60 Subpart DDDD for these requirements. It also removes references to redundant or non-applicable requirements referenced elsewhere in the rule such as the ambient monitoring standards.

The amended rule includes several key changes. First it revises the definition of an existing unit and makes it applicable to commercial and industrial incineration units that 1) were constructed on or before June 4, 2010, or 2) commenced modification or reconstruction after June 4, 2010 but no later than August 7, 2013. Second, the amended rule expands the definition of a CISWI unit to include "energy recovery units" such as boilers and process heaters, kilns, and small remote incinerators including air curtain burners that burn materials meeting the definition of a solid waste under 40 CFR 241 as a fuel stream. Third, it lowers the emissions limits for the existing CISWI units regulated under the previous EG promulgated in 2000. Fourth, it creates several categories of energy recovery units and incinerators based on primary fuel types and assigns each category specific emissions limits, operating standards, and monitoring requirements. The applicable emissions limits are found in Tables 7 through 9 of 40 CFR 60 Subpart DDDD. Lastly, it makes the emission limits applicable at all times including startup, shutdown and malfunction periods. In addition to these key changes, the amended rule has requirements for initial and continuous compliance, reporting of deviations, malfunctions and out of control periods, and has a compliance schedule for meeting the CISWI requirements.

As stated previously, the date for submission of a state plan pursuant to the revised 40 CFR 60 Subpart DDDD was February 7, 2014. However, the rule was still under reconsideration at that time. Therefore, the DAQ issued an intent to submit a Negative Declarations to the EPA. In support of this rulemaking, the DAQ has uncovered the existence of several combustion units that may be subject to the revised CISWI rule. There are three different pathways available to these units in responding to the amended rule. Under two of these pathways, the facility can take actions so that the affected combustion unit is no longer subject to CISWI requirements.

[6] Federal Register Vol. 65, No. 232, December 1, 2000 pp 75338-75376

Therefore, it is not clear at this time if North Carolina will have to submit a state plan in a parallel process to this rulemaking. In addition, existing combustion units that are currently not firing solid waste materials as a fuel stream or for disposal can make a business decision to do so in the future and become subject to the rule. If a facility should commence or recommence firing a solid waste, North Carolina would be required to submit or revise a state plan implementing the rule at that time.

V. Changes from the Regulatory Baseline

The regulatory baseline consists of the existing 15A NCAC 02D .1210 rule with no CISWI units operating in the State of North Carolina.

There are three possible outcomes for North Carolina as a result of the EPA revising 40 CFR 60 Subpart DDDD:

1. North Carolina modifies its rules to be consistent with 40 CFR 60 Subpart DDDD, imposes requirements on affected combustion units, and submits a State Plan to EPA;
2. North Carolina accepts a Federal Plan administered by either EPA or the State and any affected combustion units meet the requirements of the Federal Plan; or
3. North Carolina rescinds 15A NCAC 02D .1210. Existing combustion units would not be permitted to either incinerate or combust for heat recovery any nonhazardous secondary solid waste materials. The DAQ would submit a negative declaration to EPA regarding the presence of affected CISWI sources in North Carolina. Existing combustion units that may wish to commence or recommence firing or incinerating solid waste material would not be permitted to do so.

The DAQ proposes the first option for implementing the CISWI EG. The DAQ will amend 15A NCAC 02D .1210 to align with the requirements of both 40 CFR 60 Subpart DDDD and the Federal Plan. North Carolina will submit a State Plan to EPA should the DAQ identify any combustion units that are subject to 40 CFR 60 Subpart DDDD. If no CISWI units are identified, the DAQ will submit a Negative Declaration but the amended 15A NCAC 02D .1210 will remain in place. This approach will ensure that any existing combustion units that decide to commence or recommence firing a nonhazardous solid waste as a fuel in the future will have a rule in place to facilitate this activity.

VI. Estimation of Fiscal and Regulatory Impacts

The DAQ analyzed the fiscal impacts of the amended rule on the private sector and state government. The private sector directly affected by the rule are the owners and operators of combustion units that fire fuel streams that potentially are solid waste. These impacts are discussed in the following subsections.

Private Sector Impacts

For this rulemaking, the private sector is defined as commercial and industrial facilities that operate existing combustion units that fire nonhazardous secondary material (NHSM) that may be a solid waste pursuant to 40 CFR 241 Solid Wastes Used as Fuels or Ingredients in Combustion Units, either solely or in conjunction with traditional fuels. Note that the NHSM

solid waste being combusted is generally a byproduct of the facility's manufacturing process. The facilities currently dispose of this material either by incineration or by combusting it in a boiler or process heater. The combustion of the material and use of the heat generated in a boiler or process heater is generally referred to as "heat recovery" or "energy recovery."

Identification of Affected Combustion Units

As discussed previously, North Carolina currently has no CISWI units. However, with the expansion of the definition of a CISWI discussed above, units currently regulated under another rule may be subject to this proposed rule. The DAQ performed an extensive review of its permitted facilities in North Carolina to identify facilities that may have combustion units that fire waste materials. The DAQ then did a review of these combusted waste materials in relation to the definition of a NHSM that are solid wastes under 40 CFR 241. Lastly, the DAQ contacted several facilities directly to discuss the potential waste materials of concern and the applicability of the definition NHSM that are a solid waste to those materials.

This review process identified a number of facilities affected by the rule. The DAQ identified two boilers and two process heaters operating in North Carolina that currently fire NHSM that could be considered a solid waste pursuant to 40 CFR 241.[7] Table 2 lists these facilities along with the affected combustion unit and description of the waste listed in the air permit. These sources are considered to be "affected CISWI units" for this fiscal note. The affected sources are currently permitted under various rules for both criteria pollutants, hazardous air pollutants, and opacity.

Table 2: Facilities Identified as Potentially Burning Waste Material

Facility	County	Source	NHSM Solid Waste	Existing Emissions Controls	Mass of Waste (ton/ year)
Wilsonart (Title V)	Henderson	20 MMBtu/hr boiler firing natural gas/No. 2 fuel oil	melamine coated laminate trimmings	ESP	5,000
Sanford-Statesville (Title V)	Iredell	0.5 Mmbtu/hr natural gas-fired incinerator being used for process heat	trimmings from laminated polystyrene foam boards for signs/pictures	after burner, fabric filter	500
Jackson Paper (Title V)	Jackson	250 Mmbtu/hr boiler firing wood/coal/TDF/sludge/used oil	plastic waste from paper recycling and waste sludge	multicyclone, venturi scrubber with water or caustic	600*
Weyerhaeuser -Grifton (Title V)	Pitt	two, 57 MMBtu/hr thermal oil heaters firing biomass/used oil/washdown water/kiln condensate	absorbent from on site spills of hydraulic and fuel oils	multicyclone and dry ESP	de minimus

* 6,000 tons per year of sludge and plastic waste. Assume plastic is 10% of waste stream.

[7] Note that nonhazardous secondary materials (NHSM) solid wastes determinations are complex legal findings.

In addition, the DAQ identified 10 facilities with combustion units that are currently permitted to fire NHSM that could be considered a solid waste. Six of the facilities no longer burn the potential solid waste materials. The remaining four sources have the term "waste oil" in the emissions source description on their air permit but are actually firing "used oil." Used oil is not considered a solid waste. While these sources are not firing solid waste, their permits indicate they are. Therefore, the permits must be modified to remove the waste materials from the list of allowable fuels. This will ensure these ten combustion units are not subject to the amendments to rule 15A NCAC 02D .1210. These sources are considered "affected non-CISWI combustion units."

Lastly, there are seven commercial air curtain burners that are permitted to burn clean biomass that are affected by this rule. The DAQ is addressing this subset of affected units in the existing rule 15A NCAC 02D .1904 Air Curtain Burners. Therefore, this fiscal analysis does not include these combustion units.

Possible Compliance Pathways for Affected Combustion Units

There are three possible compliance pathways for the four facilities that operate combustion units that currently fire NHSM that could be considered a solid waste.

1. *Install Controls and Monitoring Systems:* The facility could meet the emissions limits, operating standards and monitoring, recordkeeping and reporting requirements pursuant to the EG. The primary expense to private entities is the installation and operation of air pollution control equipment and monitoring systems for several groups of pollutants including criteria pollutants such as nitrogen oxides (NO_X), particulate matter (PM), carbon monoxide (CO), sulfur dioxide (SO_2), and hazardous air pollutants (HAP) such as acid gases, metals, organic compounds, dioxins and furans.

2. *Dispose of Waste via Landfill:* The facility could choose to stop incinerating the waste or combusting the waste for energy recovery. The facility would then have to dispose of the waste via landfilling or some other means. Secondly, facilities that combust the solid waste in a boiler or process heater for heat recovery would have to make up for that heat energy by combusting an alternative fuel. In this case, the combustion unit avoids being subject to the amended rule.

3. *Obtain Non-Solid Waste Determination*: The facility would have to perform an analysis of the NHSM to determine that it is not a solid waste pursuant to 40 CFR 241 and therefore exempt from the amended CISWI rule. The waste must meet the "legitimacy criteria" in Part 241 in order to receive a determination. The determination can be approved by either the DAQ or the EPA. If the determination is approved, the combustion unit is no longer an affected CISWI source and does not have to meet the requirements of the amended rule.

Note, the rule allows an existing combustion unit to commence or recommence firing solid waste in the future. This analysis does not estimate the costs associated with existing sources opting to fire solid waste materials at a later date.

Calculation of Cost Impacts to Private Entities for Compliance Options

A. Air Pollution Controls

The four affected combustion units already have air pollution control equipment to meet emissions limits under other rules as shown in Table 1. However, it is not clear that these controls are sufficient to meet the CISWI rule emissions limits. The emissions limits in the CISWI rule are in different units, such as parts per million by volume and milligrams per dry standard cubic meters, while the emission limits in the permits of the affected CISWI units are in pounds per million Btu. It is not simple to convert between the two types of standards. Therefore, the DAQ assumed that air pollution control and monitoring systems for all pollutant categories would need to be installed for all pollutants.

Table 3 lists the pollutant categories and the types of air pollution control equipment the EPA assumed were applicable to affected CISWI combustion units. As the table indicates, affected CISWI units may need to install 5 different control systems to comply with emissions limits. For most affected CISWI units, complying with the amended rule will not be a cost-effective option. This is not true for the affected combustion units at Wilsonart and Sanford-Statesville. At these two facilities, a large percentage of the total heat input provided to the boiler at Wilsonart and the process heater at Sanford-Statesville is generated through combusting the NHSM that may be solid waste. Therefore, these two facilities may opt to install air pollution control and monitoring equipment if controls are found to be a cost-effective compliance option. The addition of controls may prove to be cost-effective if a facility finds that one or more of the control systems in Table 3 are not to be required for compliance with emissions standards.

Table 3. Air Pollution Control System Options for Meeting CISWI Standards

Pollutant	EPA CISWI Control System Options
Carbon monoxide	combustion controls, afterburner, thermal oxidizer, or oxidation catalyst
Nitrogen oxides	combustion controls, Selective Non-Catalytic Reduction (SNCR)
Sulfur dioxides, Hydrogen chloride	packed bed scrubber
Filterable particulate matter Cadmium, Lead	ESP, fabric filter
Mercury vapor, Dioxins and furans	activated carbon injection with fabric filter

Sizing and costing of air pollution control equipment is driven by a number of factors including source type, fuel type, mass or concentration of air emissions, air flow rate, and existing air pollution control equipment. Therefore, the DAQ could only preform a high-level analysis of the cost impact from installing air pollution control and monitoring equipment. The DAQ obtained costs for capital and annual control equipment and monitoring systems, and costs for initial and annual testing, recordkeeping and reporting from the EPA's Regulatory Impact Analysis (RIA)

for the subject rule.[8] More specifically, the DAQ used the cost methodology and associated spreadsheets developed by Eastern Research Group (ERG) for the EPA and detailed in the November 26, 2012 Memorandum "Final Reconsideration Compliance Cost Analyses for CISWI Units.[9]" The costs were escalated to 2017 dollars using the Chemical Engineering Plant Index.[10]

Table 4 presents the estimated total installed costs and total annual costs for Wilsonart and Sanford-Statesville to install multipollutant control systems to comply with the amended CISWI rule. The installation of air pollution control equipment would occur in 2017 to ensure compliance in 2018.

Table 4. Total Installed Costs and Annual Costs for Air Pollution Control Equipment on Wilsonart and Sanford Statesville Affected CISWI Units

Cost Parameters	Wilsonart	Sanford - Statesville
Installed Equipment Cost	$3,506,400	$525,400
Initial Testing, Monitoring, & Recordkeeping Cost	$114,900	$83,800
Total Installed Cost	**$3,621,200**	**$609,200**
Annual Operation & Maintenance Cost	$813,800	$119,100
Annual Testing, Monitoring, & Recordkeeping Cost	$91,600	$71,800
Total Annual Cost	**$905,400**	**$190,900**

B. Landfill Waste Materials

Disposing of industrial solid waste material is a complicated and requires contacting solid waste contractors to develop a specific plan for each type of waste. The cost of transporting the waste to the landfill is based on the mass of waste in tons and the distance the waste must travel ($ per ton-mile). Certain types of industrial waste may even need to travel out of state to specialized landfills. In addition, each landfill has different rates it charges to accept the waste called a "tipping fee." These fees also vary based on the type of waste. Therefore, estimating costs to landfill industrial waste material is highly waste and site specific.

The DAQ utilized national average rates for transportation costs and tipping fees from the ERG cost methodology discussed above. These costs are in 2005 dollars. The DAQ escalated the cost

[8] Regulatory Impact Analysis: Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Commercial and Industrial Solid Waste Incineration Units, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards (OAQPS), Research Triangle Park, NC, MD-C439-02, February 2011.

[9] Memorandum to Toni Jones, USEPA, from Eastern Research Group, Inc. regarding Final Reconsideration Compliance Cost Analyses for CISWI Units, Eastern Research Group, Inc, Dated November 26 2012, Docket: EPA-HQ-OAR-2003-0119-2692, Object ID: 0900006481050ad9, Posted: January 8, 2013.

[10] Chemical Engineering Plant Cost Index, *Chemical Engineering*, http://www.chemengonline.com/pci-home

of the transportation fees to 2017 dollars using producer price index for general trucking.[11] The DAQ could not find an appropriate method for escalating landfill the tipping fees to 2017 dollars due to the specific nature of the costs. However, the tipping fees represent an order of magnitude estimate for landfill disposal of industrial solid waste. Table 5 presents the estimated cost rates for solid waste disposal via landfill assumed for this fiscal analysis.

Table 5. Industrial Landfill Cost rates for Transportation and Disposal

Parameter	Average Cost Rate in 2005	Average Cost Rate in 2017
Transportation, ($/ton-mile)	$0.266	$0.337
Tipping Fee, ($/ton)	$34.29	N/A

The distance to the landfill was assumed to be 50 miles based on the methodology used in the ERG cost methodology. The tons of secondary material disposed by each facility were obtained from the most recent emissions inventory throughput data submitted to DAQ by the facilities as shown in Table 1. Note that the mass of secondary material combusted by Jackson Paper was estimated as 10% of paper sludge. The DAQ used the default average cost rates given in Table 5 to calculate the cost to dispose of the waste materials by landfilling for all four affected CISWI units as shown in Table 6. Note that the volume of waste being combusted at Weyerhaeuser-Grifton is very small, therefore there is minimal cost for alternate disposal.

Table 6. Annual Cost to Replace Waste Materials as Fuel with Pipeline Natural Gas in 2017 Dollars

Parameter	Units	Wilsonart	Sanford Statesville	Jackson Paper	Weyerhaeuser Grifton
Annual Mass of Waste	Ton/year	4,818	550	600	< 1 ton
Waste Heat Content	Btu/lb	8,000	12,300	14,000	
Waste Fuel Heat Input	MMBtu/year	77,100	13,500	16,800	
Volume of Nat Gas	ft^3/year	74,481,200	13,067,000	16,231,900	
Cost to Transport Waste		$81,183	$9,264	$10,110	$17
Cost to Landfill Waste		$165,209	$18,852	$20,574	$35
Cost of Replacement Fuel (Natural Gas)		$468,243	$82,149	$102,045	$0
Annual Cost for Alternate Disposal		**$714,635**	**$110,264**	**$132,729**	**$52**

The cost to the facilities to dispose of solid waste via landfill is an economic benefit to any service providers, i.e. the trucking companies and privately owned landfill companies, that are located in North Carolina. For this fiscal analysis, the DAQ assumed that the landfills used by the facilities to dispose of the NHSM are owned by private entities. In addition, the DAQ

[11] U.S. Bureau of Labor Statistics, Producer Price Index by Industry: General Freight Trucking [PCU4841], Data extracted on August 29, 2017

assumed that all the trucking companies and landfill companies associated with this activity are located in North Carolina. Therefore, the facility costs for alternate disposal of waste materials were added as a benefit to the private sector for this analysis. Note that the operating costs for the landfill and trucking companies was not accounted for in this analysis.

There is a second cost to the facility when using an alternative disposal method as discussed previously. The heat generated by combusting the NHSM in the boiler or process heater must be replaced by combusting an alternate fuel. To calculate this cost, the NC DAQDAQ first calculated the amount of heat generated annually based on the estimated heat content of the NHSM and the mass of NHMS combusted annually. The heat content and mass of for each type of NHSM was obtained from the most recent emission inventory submitted by each facility, except for Jackson Paper. Jackson Paper did not include a heat content for its waste plastic film, therefore, the DAQ obtained a heat input for plastic film from the American Plastics Council.[12]

The DAQ assumed that the NHSM for each combustion unit would be replaced by natural gas. Natural gas is currently being used by the affected facilities, is a low-cost fuel, and has the least regulatory impact to the facilities. The DAQ assumed that existing combustion equipment is capable of burning natural gas, and equipment conversion costs are not needed. The annual heat input calculated for each boiler or process heater was then converted to a volume of natural gas that would need to be combusted using the average heat content of natural gas in North Carolina, 1,035 British thermal units per cubic feet (Btu/ft^3) obtained from the U.S. Energy Information Administration (EIA).[13] The cost of the natural gas was calculated using this volume and the retail price of natural gas in North Carolina for 2017, $6.29 per thousand cubic feet, which was also obtained from the EIA.[14]

The total cost for alternate disposal of the solid waste materials in 2017 dollars, including both cost of landfilling and natural gas is given in Table 6. Table 4 and Table 6 indicate that the annual cost of operating air pollution controls is more expensive than the annual cost of landfilling the waste. However, the site-specific nature of both air pollution control installation and operation costs and landfill costs make it difficult for the DAQ to accurately determine which compliance pathway is the least-cost option or most likely outcome for each facility.

C. Non-Solid Waste Determination

As discussed above, a combustion unit can submit documentation to DAQ that the NHSM being fired is not a solid waste pursuant to 40 CFR 241 and, therefore, exempt from the CISWI rule. A determination on the evidence submitted is made either by DAQ or in some cases EPA. The determination involves demonstrating that the NHSM being combusted meets the "legitimacy criteria" pursuant to 40 CFR 241 as described below.

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[12] Understanding Plastic Film: Its Uses, Benefits and Waste Management Options Prepared for the American Plastics Council by Headley Pratt Consulting, December 1996.

[13] EIA Heat Content of Natural Gas Consumed, https://www.eia.gov/dnav/ng/ng_cons_heat_a_EPG0_VGTH_btucf_a.htm

[14] EIA Natural Gas Prices, https://www.eia.gov/dnav/ng/ng_pri_sum_a_EPG0_PGP_DMcf_a.htm

1. The NHSM is used in a combustion unit that remains within the control of the generator.
2. The NHSM must be managed as a valuable commodity.
3. The NHSM must contain contaminants or groups of contaminants at levels comparable in concentration to or lower than those in traditional fuel(s) that the combustion unit is designed to burn.
4. The non-hazardous secondary material must have a meaningful heating value and be used as a fuel in a combustion unit that recovers energy.

The documentation to support this determination involves a laboratory analysis of the waste material to determine if it would emit air pollution at levels similar to the "traditional fuel" for which the combustion unit was designed. A consultant generally assists the facility with preparing the documentation. The DAQ contacted a facility that recently obtained a determination regarding the costs for a consultant and waste analysis to prepare the documentation required for requesting a determination. The cost per combustion unit is shown in Table 7.

Table 7. Cost Estimate for Non-Solid Waste Determination

Cost for Non-Solid Waste Determination	$5,000 per combustion unit

Impacts to Private Sector under the Most Likely Regulatory Outcome

The DAQ reviewed the costs associated with the three compliance options for each of the four affected facilities. In addition, the DAQ reviewed the responses we received to the information request letters regarding CISWI compliance that were sent to these facilities. Using this information, the DAQ developed the most likely regulatory outcome from the available compliance options that could be pursued by the facilities in order to provide a set of costs and benefits for this fiscal analysis. **This hypothetical regulatory outcome does not represent a legal interpretation of whether a specific facility is firing a NHSM that is a solid waste.**

Under the DAQ most likely regulatory outcome, the four affected facilities are assumed to pursue the following compliance pathways:

1. Wilsonart and Jackson Paper pursue obtaining a determination that the NHSM being fired is not a solid waste and the combustion unit is no longer an affected source;
2. Sanford-Statesville and Weyerhaeuser-Grifton pursue alternative disposal via landfilling the NHSM and the combustion unit is no longer an affected source.

The cost to facilities under the most likely regulatory outcome is presented in Table 8. In the initial year of the analysis, 2017, 14 facilities must revise their permits at a cost of $13,006, two facilities incur costs of $10,000 to obtain a non-solid waste determination, and two facilities incur costs of $112,547 to landfill waste. The total cost of the amended rule to affected facilities in the initial year is estimated at $135,553. After the first year, the only facility costs are for the

two facilities that opt to landfill waste. This regulatory outcome results in the least cost impact to facilities because after Wilsonart and Jackson Paper obtain non-solid waste determinations for their NHSM, these facilities incur no additional recurring costs.

Table 8. Summary of Initial and Annual Cost Impacts to the Private Sector from Amending the CISWI Rule under the Most Likely Regulatory Outcome

Facility Cost Parameter	Wilsonart	Sanford Statesville	Jackson Paper	Weyerhaeuser Grifton	10 Affected Non-CISWI Facilities
Permitting Fees	$929	$929	$929	$929	$9,290
Non-Solid Waste Determination Cost	$5,000		$5,000		
Total Costs for Initial Year	**$5,929**	**$929**	**$5929**	**$929**	**$9,290**
Landfill Costs		$28,115		$52	
Natural Gas Costs		$82,149		$0	
Total Annual Costs	**$0**	**$110,264**	**$0**	**$52**	**$0**
Total Initial Costs	**$135,553**				
Total Annual Costs (in 2017)	**$112,547**				

State and Local Government Impacts

As stated previously, there are currently no CISWI units in North Carolina. However, with the expansion of the definition of a CISWI unit, there are some required actions on the part of the DAQ. There are several types of actions based on whether the source is currently combusting solid waste or has ceased firing solid waste.

Possible Actions Required of the DAQ

For units that are currently firing solid waste, the following activities may be required above and beyond what is required by the existing rules and permits;

1. Revise the permit of affected units to include the amended CISWI rule requirements;
2. Approve the facility plans for controls, monitoring, operator training, and waste disposal;
3. Review initial and annual performance tests; and
4. Review facility requests for a determination that a NHSM being combusted by a source is not solid waste pursuant to 40 CFR 241;

For units that are currently not firing solid waste or cease firing solid waste, the following activities may be required.

1. Revise permits to remove solid waste as a permitted fuel for the combustion source; and
2. Revise permits to clarify or correct the description of the material being combusted.

Calculation of Cost Impacts to the DAQ for Various Actions

The costs expected to be incurred by the DAQ as a result of the amendments to the rule are primarily labor costs. To develop the cost impact of the rule, the DAQ first estimated the average cost of DAQ employees. The average salaries for three categories of engineers were obtained from DAQ Human Resources. This salary was then adjusted to account for employee benefits using the Office of State Human Resources compensation calculator.[15] An hourly cost for an engineer was then calculated assuming an employee works 2,080 hours per year. Table 9 gives the average hourly cost for each category of DAQ employee.

Table 9. Average Hourly Cost of DAQ Employees

DAQ Employee	Annual Salary plus Benefits	Average Hourly Cost of DAQ Employees
Supervisor	$127,451	$61.27
Journey Engineer	$90,231	$43.38
Contributing Engineer	$74,342	$35.74

The DAQ then estimated of the number of hours and the cost for the DAQ to perform the activities discussed above for the affected facilities. The majority of the costs are related to permitting and incurred in the first year of this analysis, 2017. The estimate to revise permits includes the work to revise 14 permits at both affected CISWI units and non-CISWI units. The DAQ then developed an estimate of the number of hours and costs for the DAQ to perform the permitting and compliance duties related to each compliance pathway. Note these estimates represent the incremental work performed by the DAQ on activities related to the amended rule. Table 10 presents the estimated costs for the DAQ to perform permitting and compliance duties for the affected facilities under various regulatory outcomes. The costs presented are for two facilities installing air pollution controls and two facilities obtain determinations that the NHSM is not a solid waste. There is no cost to the DAQ if the facility opts to landfill the waste (except for the cost to revise the permit).

Table 10. DAQ Costs for Permitting and Compliance Activities

DAQ Activity	Estimated DAQ Cost
Cost to Revise 14 Permits	$7200 to $5300
Cost to Review Plans	$1,858
Cost to Review Tests	$2,584
Cost to Review Determinations	$1,164

[15] https://oshr.nc.gov/state-employee-resources/classification-compensation/total-compensation-calculator

Impacts to State and Local Government Under the Most Likely Regulatory Outcome

As discussed previously, the most likely regulatory outcome is that Wilsonart and Jackson Paper receive non-solid waste determinations and Sanford-Statesville and Weyerhaeuser-Grifton opt to landfill waste. This outcome results in the least cost impact to the DAQ compared to the other compliance pathways that were examined. This is because the facilities take actions to avoid complying with the CISWI rule. Initial costs related to revising permits and reviewing determinations are incurred in 2017, which is the year prior to the February 7, 2018 compliance date. There are no costs impacts to the DAQ after the initial year. As shown by Table 11, the DAQ will not experience significant economic impacts due to these proposed rule changes. In addition, the three local air quality agencies are not affected by the amendments to the rule since no affected CISWI units are located in these areas.

Table 11. DAQ Cost Impacts from Amending the CISWI Rule under the Most Likely Regulatory Outcome

DAQ Employee	Revise Permit (hours)	DAQ Cost	Review HSM Determination (hours)	DAQ Cost
Supervisor	13	$797	2	$123
Journey Engineer	104	$4,512	24	$1,041
Contributing Engineer	0	$0		$0
Total Cost		**$5,308**		**$1,164**
Total DAQ Initial Costs		$6,472		
Total DAQ Annual Cost		$0		

The DAQ charges a $929 fee to revise a permit. We estimate that 14 facilities will require a permit modification of some type due to this rulemaking. The permit fees paid by the 14 facilities, $13,000, will offset the DAQ's costs for this rulemaking.

VI. Estimation of Human Health Benefits

This section estimates the monetary benefits from improvements in human health due to the emissions reductions resulting from amending 15A NCAC 02D .1210. Specifically, this analysis estimates the monetary benefits associated with reductions in emissions of particulate matter of 2.5 microns or less ($PM_{2.5}$).

Reductions in Emissions of Air Pollutants

The DAQ obtained the emissions inventory data that the facilities submitted to the State for the most recent year for all four affected CISWI units. The inventories provide estimates of the emissions of criteria air pollutants (CAP) and hazardous air pollutants (HAP) from the combustion of waste materials in the affected boilers and process heaters as reported by the facilities. Note that emissions from the combustion of plastic film waste at Jackson Paper were

estimated as 10% of the emissions from the paper sludge fuel stream. Emissions from the combustion of waste oil sorbent were not reported by Weyerhaeuser-Grifton. The DAQ assumed that these emissions are insignificant compared to the emissions from the other affected facilities since less than 1 ton per year of the NHSM is combusted. Table 12 presents the emissions inventory data for each facility.

Table 12. Emissions Inventory Data for Affected CISWI Units

Facility	Wilsonart 2016	Sanford Statesville 2015	Jackson Paper 2015	Weyerhaeuser Grifton	Total Emissions
Criteria Air Pollutant	**Annual Emissions (ton/year)**				
Carbon dioxide	11.40	1.32	0.35	not reported	13.07
Nitrogen oxides	36.20	0.40	0.22		36.82
PM_{10}	0.11	0.00	0.11		0.22
$PM_{2.5}$	0.10	0.00	0.11		0.21
Sulfur dioxide	1.84	0.33	0.02		2.19
Volatile organic compounds	0.69	0.40	0.02		1.11
Hazardous Air Pollutant	**Annual Emissions (lb/year)**				
Formaldehyde	125.21	not reported	not reported	not reported	125.21
Hydrogen chloride	1,368				1,368
Mercury, vapor	0.252				0.25
Methanol	195.19				195.19
Phenol	34.62				34.62

Human Health Benefits

In EPA's Regulatory Impact Analysis for the CISWI NSPS and EG rulemaking, the EPA provided an estimate of the monetized benefits to human health associated with reducing particulate matter (PM) emissions. The PM reductions are the result of emission limits on $PM_{2.5}$, emission limits on $PM_{2.5}$ precursors such as nitrogen oxides (NO_x) and sulfur dioxide (SO_2), as well as ancillary reductions from emission limits on other pollutants. The primary $PM_{2.5}$-related health effects that were monetized in EPA's RIA are listed below.

- Adult premature mortality
- Bronchitis: chronic and acute
- Hospital admissions: respiratory/cardiovascular
- Emergency room visits for asthma
- Nonfatal heart attacks
- Lower and upper respiratory illness
- Minor restricted-activity days
- Work loss days
- Asthma exacerbations
- Infant mortality

There are additional emissions reductions that occur for other criteria pollutants and hazardous air pollutants (HAP) such as carbon monoxide (CO), metals, organic compounds and acid gases. Since the EPA did not monetize the direct benefits associated with reducing these other

pollutants, the monetized benefits presented in this fiscal analysis are an underestimate of the total benefits of the proposed amendments. The EPA discusses the adverse health effects associated with HAP emissions in Section 5 of the RIA.

Methodologies, assumptions, uncertainties and other factors used in EPA's health benefits analysis for $PM_{2.5}$ are detailed in Section 5 of the RIA. Note the estimated benefits represent average benefits-per-ton of pollutant reduced over the entire United States and are not specific to North Carolina. The EPA used a 7% discount rate to estimate the total monetized benefits of both the CISWI NSPS and EG to be approximately $530 million in the implementation year. The costs developed by EPA were presented in 2008 dollars. The EPA analysis includes any energy dis-benefits from additional energy usage required to operate equipment.

Using the EPA's human health benefits data, the DAQ calculated the benefits on a dollar per ton of pollutant reduced basis. This ratio was calculated by dividing the average of the range of monetary benefits for the U.S. by the estimated emissions reductions in $PM_{2.5}$ and its precursors. The ratio was adjusted from 2008 to 2017 dollars using the Consumer Price Index of 1.31 for medical care.[16] Table 13 presents the calculated dollar per ton ratio based on the data in the RIA.

Table 13. Benefits Ratio in Dollars Saved per Ton of Pollutant Reduced

Pollutant	National Emissions Reductions (tons)	Range of Total Monetized Benefits (millions 2008$ at 7%)	Ratio of Average Benefits to Emissions Reductions $/ton	Benefits Ratio Adjusted to 2017 $/ton
Direct $PM_{2.5}$	710	$150 to $360	$359,155	$469,993
$PM_{2.5}$ Precursors				
NO_2	5,544	$24 to $59	$7,486	$9,796
SO_2	5,170	$140 to $340	$46,422	$60,748

The DAQ then calculated the annual monetary human health benefits for the most likely regulatory outcome by multiplying the expected emissions reductions in the State of North Carolina by the monetary benefits ratio given in Table 13. When calculating the emissions reductions due to the rulemaking, the DAQ assumed 100% control of emissions from facilities opting to landfill waste and no control of emissions for facilities receiving a non-solid waste determination. All the NOx is assumed to be in the form of NO_2. Table 14 presents a summary of the human health benefits calculated for the amended rule.

[16] CPI Detailed Reports, Data for January 2017 and January 2008, U.S. Bureau of Labor and Statistics, https://www.bls.gov/cpi/detailed-report.htm

Table 14. Annual Human Health Monetary Benefits Expected for North Carolina Under the Most Likely Regulatory Outcome

Criteria Air Pollutant	North Carolina Emissions Reductions (ton/year)	Ratio of Monetary Benefits to Reductions in 2017 ($/ton)	Monetary Benefits for North Carolina in $2017
PM2.5	0.00	$469,993	$0
NOx	0.40	$9,796	$3,918
SO2	0.33	$60,748	$20,047
Annual Total Human Health Benefits			**$23,965**

VII. Cost and Benefit Analysis

The DAQ developed a cost and benefit analysis of the proposed amendments to 15A NCAC 02D .1210. The analysis is based on the compliance pathways most likely to be pursued by the affected facilities. This regulatory outcome was determined by the DAQ from the cost of the three pathways for each facility and the facility responses the DAQ received to its request for information. It uses the cost impacts developed in the previous section for the private sector and state government. The DAQ then presents a sensitivity analysis of the fiscal impact of the rule based on alternate compliance pathways that the facilities could choose to pursue.

The fiscal analysis was performed over a 10-year period for two reasons. First, costs to both the private sector and state government are expected to remain constant after the second year of the fiscal analysis. Second, estimating costs for compliance beyond 10 years is difficult due to changes in markets, transportation costs, fuel costs, and other factors that influence the compliance and operations decisions made by affected facilities. As discussed previously, the DAQ determined the most likely regulatory outcome is that two facilities receive a NHSM determination and two facilities landfill the NHSM and replace the waste fuel stream with natural gas. In addition, the 10 affected Non-CISWI units are required to modify their permits to ensure that they do not combust waste in the future.

The DAQ developed a table laying out the estimated cash flows for the analysis from 2017, the year prior to the compliance date of February 7, 2018, through 2026, ten years later. The greatest cost impact occurs in 2017 when fourteen facilities must modify their permits, two facilities must obtain a determination, and two facilities must begin alternate disposal of the waste prior to the February 2018 compliance deadline. In 2018 and subsequent years, the costs and benefits are limited to those associated with alternative disposal of the waste.

In this analysis, the DAQ included the facility costs associated with hauling the waste and disposing of it via landfill as a benefit to North Carolina privately owned companies providing

those services. These costs in 2017 were estimated at $9,281 and $ 18,887, respectively. Note that the DAQ did not attempt to estimate the operating costs for these companies in this analysis.

The DAQ escalated the facility costs for hauling the waste to landfills and use of natural gas over the first five years of the rule. The DAQ escalated the costs for diesel fuel and natural gas by using projection data from the Energy Information Administration (EIA)[17]. The escalation was limited to five years since fuel forecasts are less accurate further out.

The DAQ then calculated the total financial impact for each year by adding the costs and subtracting savings or benefits. Table 15 presents the cash flows and the summation of the impacts. Over 10 years, the amended rule costs the private sector and state government approximately $589,000 in 2017 dollar terms.[18] The primary driver is the cost of alternate disposal of the NHSM required by two facilities as a result of the amended rule. The human health benefits under this regulatory outcome are limited to only $24,000.

The State of North Carolina requires calculating whether a new or revised regulation has a "substantial economic impact." Substantial economic impact is defined in North Carolina's Administrative Procedures Act in NC General Statute 150B-21.4, Fiscal and Regulatory Impact Analysis on Rules as an aggregate financial impact on all persons affected of at least one million dollars in a 12-month period. The highest aggregate 12-month impact is $192,000 for this rule. Therefore, the amendments to the rule are <u>not</u> considered to have a substantial economic impact on North Carolina.

[17] Source: AEO 2017 Annual Projections to 2050 https://www.eia.gov/analysis/projection-data.cfm#annualproj

[18] The total impact of the proposed rules over the next 10 years, in 2017 dollar value terms, was calculated by computing the "net present value" of the rule. This calculation allows for an apples-to-apples comparison of future costs and benefits on a common dollar value basis. The method accounts for the "time value of money," the concept that money is worth more in the near term than in the long term because of the capacity to earn interest over time. The present value of a future stream of costs and benefits answers the question, "What is the investment/action worth to me in today's dollar value equivalent?" Different investments/actions can be accurately compared using their net present values. The net present value of this proposed rulemaking indicates that the rule will cost the state of North Carolina approximately $588,982 given the time value of money (7% discount rate) over 10 years.

Table 15. Fiscal Impact of Most Likely Regulatory Outcome

Year	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Private Sector Costs	**$133,322**	**$118,941**	**$128,233**	**$137,163**	**$137,569**	**$136,738**	**$136,738**	**$136,738**	**$136,738**	**$136,738**
1. Permit Application Fee ($929)	$13,006									
2a. Total Installed Cost for Controls	$0									
2b. Total Annual Cost for Control	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
3. Testing, Monitoring & Recordkeeping	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
4. Landfill Costs	$18,887	$18,887	$18,887	$18,887	$18,887	$18,887	$18,887	$18,887	$18,887	$18,887
5. Transportation Costs	$9,281	$10,224	$10,872	$11,257	$11,550	$11,903	$11,903	$11,903	$11,903	$11,903
6. Cost of Replacement Fuel	$82,149	$89,831	$98,475	$107,019	$107,133	$105,948	$105,948	$105,948	$105,948	$105,948
7. Cost of NHSM Determination	$10,000	$0	$0	$0	$0	$0	$0	$0	$0	$0
State Government Costs	**-$6,534**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
1. Permit Application Fee	-$13,006									
2. Revise Permit	$5,308									
3. Review NHSM Determination	$1,164									
Private Sector Benefits	**$28,167**	**$10,224**	**$10,872**	**$11,257**	**$11,550**	**$11,903**	**$11,903**	**$11,903**	**$11,903**	**$11,903**
1. Trucking Company Benefits	$9,281	$10,224	$10,872	$11,257	$11,550	$11,903	$11,903	$11,903	$11,903	$11,903
2. Landfill Company Benefits	$18,887	$18,887	$18,887	$18,887	$18,887	$18,887	$18,887	$18,887	$18,887	$18,887
3. Landfill Company Costs					unquantified					
Human Health Benefits	**$23,965**	**$23,965**	**$23,965**	**$23,965**	**$23,965**	**$23,965**	**$23,965**	**$23,965**	**$23,965**	**$23,965**
Total Impact (+Cost -Savings)	**$74,656**	**$65,866**	**$74,510**	**$83,054**	**$83,168**	**$81,983**	**$81,983**	**$81,983**	**$81,983**	**$81,983**
Net Present Value	**$588,982**									
Substantial Impact Analysis	**$191,988**									

VIII. Sensitivity Analysis

The DAQ calculated the costs and benefits associated with other compliance pathway options for the facilities. This analysis shows the sensitivity of the compliance pathways chosen by each facility on the fiscal impact of the proposed amendments to the rule.

First, the DAQ developed costs and benefits for two facilities installing and operating air pollution controls and two facilities opting to landfill the NHSM. The facilities that install controls combust NHSM in sufficient quantities to potentially make controlling emissions a cost-effective approach over the long term. Note that the facility costs assume that all 5 categories of air pollution controls presented in Table 5 would be required. This may be an overestimate of what is required by the two facilities for compliance. The DAQ estimated cash flows from 2017 through 2026 and calculated the net impact. Table 16 presents these cash flows. Installing controls at a cost of approximately $4.0 million dollars with annual costs to operate controls of roughly $1.1 million dollars increases the net impact of the proposed rule amendments to $8.3 million dollars over ten years. The human health benefits, however, substantially increase to over $538,000 dollars annually.

For the second sensitivity analysis, all four affected CISWI units were assumed to landfill the NHSM fuel stream and replace it with natural gas at a cost of approximately $1.1 million annually on average. While this is a substantial cost to the facilities, this compliance pathway also maximizes the benefits to human health, $592,000 annually, since emissions are completely reduced. In addition, the facilities avoid complying with the CISWI rule and the regulatory burden of ongoing control, monitoring, recordkeeping and reporting. Table 17 presents the cash flows and calculated net impact for this analysis. Using the net present value, this rule has a net impact of approximately $1.5 million dollars over ten years.

The economic impact of the proposed amendments to the rule are highly sensitive to the compliance options available to each facility. Some outcomes result in minimal net impact while other outcomes result in substantially higher impacts. This sensitivity is primarily driven by the cost to install air pollution controls in the first case and the cost to replace the waste fuel with natural gas in the second case.

Table 16. Sensitivity Analysis of Installing Controls at Two Facilities

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Private Sector Costs	**$4,376,182**	**$1,239,660**	**$1,251,105**	**$1,262,139**	**$1,262,600**	**$1,261,514**	**$1,261,514**	**$1,261,514**	**$1,261,514**	**$1,261,514**
1. Permit Application Fees	$13,006									
2a. Total Installed Cost for Controls	$4,031,744									
2b. Total Annual Cost for Controls	$0	$932,914	$932,914	$932,914	$932,914	$932,914	$932,914	$932,914	$932,914	$932,914
3. Testing, Monitoring, Recordkeeping	$198,651	$163,393	$163,393	$163,393	$163,393	$163,393	$163,393	$163,393	$163,393	$163,393
4. Alternative Disposal Costs	$30,736	$31,765	$32,473	$32,893	$33,213	$33,597	$33,597	$33,597	$33,597	$33,597
5. Cost of Replacement Fuel	$102,045	$111,588	$122,325	$132,939	$133,080	$131,609	$131,609	$131,609	$131,609	$131,609
State Government Costs	**-$2,032**	**$659**	**$659**	**$659**	**$659**	**$659**	**$659**	**$659**	**$659**	**$659**
1. Permit Application Fee	-$13,006									
2. Revise Permit	$7,191									
3. Approve Facility Plans	$1,858									
4. Review Initial/Annual Tests	$1,925	$659	$659	$659	$659	$659	$659	$659	$659	$659
Private Sector Benefits	**$30,736**	**$31,765**	**$32,473**	**$32,893**	**$33,213**	**$33,597**	**$33,597**	**$33,597**	**$33,597**	**$33,597**
Trucking Company Benefits	$10,127	$11,156	$11,864	$12,284	$12,604	$12,988	$12,988	$12,988	$12,988	$12,988
Landfill Company Benefits	$20,609	$20,609	$20,609	$20,609	$20,609	$20,609	$20,609	$20,609	$20,609	$20,609
3. Landfill Company Costs					unquantified					
Human Health Benefits	**$537,912**	**$537,912**	**$537,912**	**$537,912**	**$537,912**	**$537,912**	**$537,912**	**$537,912**	**$537,912**	**$537,912**
Total Impact (+Cost -Savings)	**$3,805,503**	**$670,642**	**$681,380**	**$691,994**	**$692,135**	**$690,663**	**$690,663**	**$690,663**	**$690,663**	**$690,663**
Net Present Value	**$8,280,723**									
Substantial Impact Analysis	**$4,946,861**									

Table 17. Sensitivity Analysis of all Four Facilities Disposing of NHSM via Landfill

Year	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Facility Costs	**$988,405**	**$1,048,290**	**$1,125,832**	**$1,199,708**	**$1,203,809**	**$1,197,968**	**$1,197,968**	**$1,197,968**	**$1,197,968**	**$1,197,968**
1. Permit Application Fee	$13,006									
2a. Total Installed Cost for Controls	$0									
2b. Total Annual Cost for Control	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
3. Testing, Monitoring & Recordkeeping	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
4. Alternative Disposal Costs	$305,244	$315,466	$322,494	$326,666	$329,841	$333,662	$333,662	$333,662	$333,662	$333,662
5. Natural Gas to Replace Waste	$670,156	$732,824	$803,338	$873,043	$873,969	$864,307	$864,307	$864,307	$864,307	$864,307
State Government Costs	**-$7,290**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
1. Permit Application Fee	-$13,006									
2. Revise Permit	$5,716									
Private Sector Benefits	**$305,244**	**$315,466**	**$322,494**	**$326,666**	**$329,841**	**$333,662**	**$333,662**	**$333,662**	**$333,662**	**$333,662**
1. Trucking Company Benefits	$100,574	$110,796	$117,824	$121,996	$125,171	$128,992	$128,992	$128,992	$128,992	$128,992
2. Landfill Company Benefits	$204,670	$204,670	$204,670	$204,670	$204,670	$204,670	$204,670	$204,670	$204,670	$204,670
3. Landfill Company Costs					unquantified					
Human Health Benefits	**$591,646**	**$591,646**	**$591,646**	**$591,646**	**$591,646**	**$591,646**	**$591,646**	**$591,646**	**$591,646**	**$591,646**
Total Impact (+Cost -Savings)	**$66,507**	**$121,802**	**$190,452**	**$258,314**	**$259,215**	**$249,809**	**$249,809**	**$249,809**	**$249,809**	**$249,809**
Net Present Value	**$1,536,711**									
Substantial Impact Analysis	**$1,874,866**									

IX. Rule Alternatives

The DAQ is required to analyze alternative approaches under the proposed rulemaking if a substantial economic impact to the state and/or private sector entities is expected to result from the rulemaking. Two alternatives to the proposed rulemaking are discussed below.

The first alternative is for North Carolina to take no action on the revision to 40 CFR 60 Subpart DDDD. In this case, the EPA would impose a federal plan on North Carolina pursuant to 40 CFR Part 62, Subpart III, assuming that the EPA identified facilities with combustion units subject to 40 CFR 60 Subpart DDDD. This is an undesirable alternative because, while the affected facilities must meet the same requirements to operate the unit under a state plan or a federal plan, federal implementation of the EG requirements, rather than state-driven implementation, results a lack of state guidance and oversight related to compliance and enforcement. North Carolina's regulated community prefers working with state agencies and regional offices on matters that relate to their facility due to the DAQ's familiarity with site-specific operating characteristics.

The second alternative is for North Carolina to repeal the existing 15A NCAC 02D .1210 rule and not replace it. This would require any existing CISWI units to cease combusting NHSM that is solid waste and to dispose of it via landfill or some other means. This approach is more restrictive than the EPA's rule since it limits the compliance options available to any affected CISWI units and limits the ability of existing combustion units to commence firing solid waste in the future. Therefore, this alternative would trigger North Carolina General Statute 150B-19.3 also called the "Hardison Amendment." This law prohibits the DAQ from adopting a more restrictive environmental standard, limitation, or requirement than those imposed by federal law or rule. If a rule is more restrictive, that rule is subject to legislative review under the provisions of G.S. 150B-21.3(b1) as if the rule received written objections from 10 or more persons under G.S. 150B-21.3(b2). The legislative review could be scheduled as late as the 2019 long session of the North Carolina General Assembly. This lengthy process would create uncertainty for the regulated community, especially given the federal rule compliance date of February 7, 2018.

X. Conclusions

The DAQ proposes amending 15A NCAC 02D .1210 to be consistent with EPA's revised EG for CISWI units pursuant to 40 CFR 60 Subpart DDDD. The DAQ reviewed alternatives to this regulatory approach, including accepting a federal plan imposed by the EPA and repealing the existing rule without replacement. The alternatives could cause regulatory uncertainty for the facilities, may restrict their operations in the future, and delay the compliance schedule beyond that required in the federal rule.

The DAQ identified four facilities that may be affected by the revisions to 40 CFR 60 Subpart DDDD and developed three pathways the facilities could use to be in compliance with or avoid the amended rule. The pathways that avoid the rule, specifically obtaining a non-solid waste determination, are generally the least costly option for the facilities. However, not all the affected facilities can use this compliance option due to the NHSM being fired.

Given the type of NHSM fuel being fired and the cost of the various compliance options, the DAQ developed the most likely regulatory outcome of the proposed rule amendments. This

outcome assumes that two facilities obtain non-solid waste determinations for the NHSM fuel streams and two facilities dispose of the waste fuel streams via a landfill and avoid becoming subject to the amended rule.

The net impact from the most likely regulatory outcome is a cost to North Carolina's state government and private sector of approximately $589,000 over ten years and in 2017 dollars. This outcome has limited health benefits, $24,000 per year, since two of the four affected facilities continue to fire NHSM. Using the definition of "substantial economic impact" under NC General Statute 150B-21.4, this fiscal analysis indicates that amending the rule would not cause a substantial economic impact to all affected persons in a 12-month period.

Due to the various compliance options available to the facilities, the DAQ examined the sensitivity of the estimated net fiscal impact to these options. This analysis indicates that the fiscal impact is highly sensitive to the compliance pathway chosen by each affected facility. The net impact ranges from $589,000 to $8.3 million over a ten-year period depending on the compliance assumptions made for each affected facility.

The quantified human health benefits are also sensitive to the compliance pathways chosen by each affected facility. The DAQ calculated the range of health benefits from the reduction of $PM_{2.5}$ to be from $24,000 to $592,000, depending on the compliance pathway chosen by each facility. There are additional benefits that are not quantified for this analysis from reductions in HAP and carbon monoxide emissions as well.

APPENDIX A

Proposed Amendments to 15A NCAC 02D .1210

15A NCAC 02D .1210 COMMERCIAL AND INDUSTRIAL SOLID WASTE INCINERATION UNITS

(a) Applicability. ~~With the exceptions~~ Unless exempt as described in Paragraph (b) of this Rule, this Rule applies to ~~the~~ existing commercial and industrial solid waste ~~incinerators (CISWI).~~ incineration (CISWI) units, including energy recovery units, kilns, small remote incinerators and air curtain incinerators that burn solid waste, pursuant to 40 CFR 60.2550 and as defined in 40 CFR 60.2875. An existing CISWI unit is a unit that commenced construction on or before June 4, 2010, or commenced modification or reconstruction after June 4, 2010 but no later than August 7, 2013.

(b) Exemptions. The following types of ~~incineration~~ combustion units are exempted from this Rule:

(1) incineration units subject to ~~covered under~~ Rules 15A NCAC 02D .1203 through 15A NCAC 02D .1206 ~~of this Section:~~ and 15A NCAC 02D .1212;

(2) pathological waste incineration units ~~units,~~ burning 90 percent or more by weight on a calendar-quarter basis, excluding the weight of auxiliary fuel and combustion air, of ~~agricultural waste,~~ pathological waste, low-level radioactive waste, or chemotherapeutic waste as defined in 40 CFR 60.2875, ~~waste,~~ if the owner or operator of the unit:

(A) notifies the Director that the unit qualifies for this exemption; and

(B) keeps records on a calendar-quarter basis of the weight of ~~agricultural waste,~~ pathological waste, ~~low-level~~ low-level radioactive waste, or chemotherapeutic waste burned, and the weight of all other fuels and wastes burned in the unit;

(3) small power production or cogeneration units if;

(A) the unit qualifies as a small power-production facility ~~under~~ pursuant to Section 3(17)(C) of the Federal Power Act (16 U.S.C. 796(17)(C)) or as a cogeneration facility ~~under~~ pursuant to Section ~~section~~ 3(18)(B) of the Federal Power Act (16 U.S.C. 796(18)(B));

(B) the unit burns homogeneous waste (not including refuse-derived fuel) to produce ~~electricity; and~~ electricity, steam or other forms of energy used for industrial, commercial, heating, or cooling purposes;

(C) the owner or operator of the unit notifies the Director that the unit qualifies for this exemption; and

(D) the owner or operator of the unit maintains the records specified in 40 CFR 60.2740(v) for a small power-production facility or 40 CFR 60.2740(w) for a cogeneration facility;

(4) units that combust waste for the primary purpose of recovering metals;

(5) cyclonic barrel burners;

(6) rack, part, and drum reclamation units that burn the coatings off racks used to hold small items for application of a coating;

~~(7) cement kilns;~~

~~(8)~~(7) chemical recovery units burning materials to recover chemical constituents or to produce chemical compounds ~~as listed~~ pursuant to the definition of "chemical recovery unit" in 40 CFR ~~60.2555(n)(1) through (7);~~60.2875;

~~(9)~~(8) laboratory analysis units that burn samples of materials for the purpose of chemical or physical analysis;

~~(10)~~(9) air curtain ~~burners covered under Rule .1904 of this Subchapter.~~ incinerators that burn only the materials listed in Parts (A) through (C) of this Subparagraph shall meet the requirements specified in 15A NCAC 02D .1904:

(A) 100 percent wood waste;

(B) 100 percent clean lumber; and

(C) 100 percent mixture of only wood waste, clean lumber, and/or yard waste;

(10) sewage treatment plants that are subject to 40 CFR 60 Subpart O Standards of Performance for Sewage Treatment Plants;

(11) space heaters that meet the requirements of 40 CFR 279.23;

(12) soil treatment units that thermally treat petroleum contaminated soils for the sole purpose of site remediation.

(13) The owner or operator of a combustion unit that is subject to this Rule may petition for an exemption to this Rule by obtaining a determination that the material being combusted is one of the following:

(A) not a solid waste pursuant to the legitimacy criteria of 40 CFR 241.3(b)(1);

(B) a non-waste pursuant to the petition process submitted pursuant to 40 CFR 241.3(c); or

(C) a fuel that has been processed from a discarded non-hazardous secondary material pursuant to 40 CFR 241.3(b)(4).

~~(c) The owner or operator of a chemical recovery unit not listed under 40 CFR 60.2555(n) may petition the Director to be exempted. The petition shall include all the information specified under 40 CFR 60.2559(a). The Director shall approve the exemption if he finds that all the requirements of 40 CFR 60.2555(n) are satisfied and that the unit burns materials to recover chemical constituents or to produce chemical compounds where there is an existing market for such recovered chemical constituents or compounds.~~

~~(d)~~(c) Definitions. For the purpose of this Rule, the definitions contained in 40 CFR 60.2875 apply in addition to the definitions in ~~Rule .1202 of this Section.~~15A NCAC 02D .1202. Solid waste is defined under 40 CFR 60.2875 and 40 CFR Part 241 Standards for Combustion of Non-Hazardous Secondary Materials (NHSM).

(d) Compliance Schedule. All CISWI units subject to this Rule shall be in compliance with this Rule no later than February 7, 2018.

(e) Emission Standards. The emission standards in this Rule apply to all CISWI units~~incinerators~~ subject to this Rule except where ~~Rules~~ 15A NCAC 02D .0524, .1110, or .1111 ~~of this Subchapter~~ applies. When ~~Subparagraphs (12) or (13)~~ Subparagraph (3) of this Paragraph and ~~Rules~~ 15A NCAC 02D .0524, .1110, or .1111 ~~of this Subchapter~~ regulate the same pollutant, the more restrictive provision for each pollutant applies, notwithstanding provisions of ~~Rules~~ 15A NCAC 02D .0524, .1110, or .1111 ~~of this Subchapter~~ to the contrary.

(1) CISWI units subject to this rule, including any bypass stack or vent, must meet the emissions limits specified in Tables 6 through 9 of 40 CFR 60 Subpart DDDD. The emission limitations apply at all times the unit is operating including and not limited to startup, shutdown, or malfunction.

(2) Units that do not use wet scrubbers must maintain opacity to less than or equal to 10 percent opacity using an averaging time of three 1-hour blocks consisting of ten 6-minute average opacity values as measured by 40 CFR 60 Appendix A-4 Test Method 9 pursuant to Table 2 of 40 CFR 60 Subpart DDDD.

~~(1) Particulate Matter. Emissions of particulate matter from a CISWI unit shall not exceed 70 milligrams per dry standard cubic meter corrected to seven percent oxygen (dry basis).~~

~~(2) Opacity. Visible emissions from the stack of a CISWI unit shall not exceed 10 percent opacity (6-minute block average).~~

~~(3) Sulfur Dioxide. Emissions of sulfur dioxide from a CISWI unit shall not exceed 20 parts per million by volume corrected to seven percent oxygen (dry basis).~~

~~(4) Nitrogen Oxides. Emissions of nitrogen oxides from a CISWI unit shall not exceed 368 parts per million by volume corrected to seven percent oxygen (dry basis).~~

~~(5) Carbon Monoxide. Emissions of carbon monoxide from a CIWI unit shall not exceed 157 parts per million by volume, corrected to seven percent oxygen (dry basis).~~

~~(6)~~(3) Odorous Emissions. Any incinerator subject to this Rule shall comply with ~~Rule~~ 15A NCAC 02D .1806 ~~of this Subchapter~~ for the control of odorous emissions.

~~(7) Hydrogen Chloride. Emissions of hydrogen chloride from a CISWI unit shall not exceed 62 parts per million by volume, corrected to seven percent oxygen (dry basis).~~

~~(8) Mercury Emissions. Emissions of mercury from a CISWI unit shall not exceed 0.47 milligrams per dry standard cubic meter, corrected to seven percent oxygen.~~

~~(9) Lead Emissions. Emissions of lead from a CISWI unit shall not exceed 0.04 milligrams per dry standard cubic meter, corrected to seven percent oxygen.~~

~~(10) Cadmium Emissions. Emissions of cadmium from a CISWI unit shall not exceed 0.004 milligrams per dry standard cubic meter, corrected to seven percent oxygen.~~

~~(11) Dioxins and Furans. Emissions of dioxins and furans from a CISWI unit shall not exceed 0.41 nanograms per dry standard cubic meter (toxic equivalency basis), corrected to seven percent oxygen. Toxic equivalency is given in Table 4 of 40 CFR part 60, Subpart DDDD.~~

~~(12)~~(4) Toxic Emissions. The owner or operator of any CISWI unit ~~incinerator~~ subject to this Rule shall demonstrate compliance with ~~Section~~ 15A NCAC 02D .1100 ~~of this Subchapter~~ according to 15A NCAC 02Q .0700.

~~(13) Ambient Standards.~~

~~(A) In addition to the ambient air quality standards in Section .0400 of this Subchapter, the following ambient air quality standards, which are an annual average, in milligrams per cubic meter at 77 degrees F (25 degrees C) and 29.92 inches (760 mm) of mercury pressure, and which are increments above background concentrations, apply aggregately to all incinerators at a facility subject to this Rule:~~

~~(i) arsenic and its compounds $2.3x10^{-7}$~~

~~(ii) beryllium and its compounds 4.1x10-6~~

~~(iii) cadmium and its compounds 5.5x10-6~~

~~(iv) chromium (VI) and its compounds 8.3x10-8~~

~~(B) The owner or operator of a facility with incinerators subject to this Rule shall demonstrate compliance with the ambient standards in Subparts (i) through (iv) of Part (A) of this Subparagraph by following the procedures set out in Rule .1106 of this Subchapter. Modeling demonstrations shall comply with the requirements of Rule .0533 of this Subchapter.~~

~~(C) The emission rates computed or used under Part (B) of this Subparagraph that demonstrate compliance with the ambient standards under Part (A) of this Subparagraph shall be specified as a permit condition for the facility with incinerators as their allowable emission limits unless Rules .0524, .1110, or .1111 of this Subchapter requires more restrictive rates.~~

(f) Operational Standards.

(1) The operational standards in this Rule do not apply to any ~~incinerator~~ CISWI unit subject to this Rule when applicable operational standards in ~~Rules~~ 15A NCAC 02D .0524, .1110, or .1111 ~~of this Subchapter~~ apply.

(2) The owner or operator of any CISWI unit subject to this Rule shall operate the CISWI unit according to the provisions in 40 CFR 60.2675. ~~If a wet scrubber is used to comply with emission limitations:~~

~~(A) operating limits for the following operating parameters shall be established:~~

~~(i) maximum charge rate, which shall be measured continuously, recorded every hour, and calculated using one of the following procedures:~~

~~(I) for continuous and intermittent units, the maximum charge rate is 110 percent of the average charge rate measured during the most recent compliance test demonstrating compliance with all applicable emission limitations; or~~

~~(II) for batch units, the maximum charge rate is 110 percent of the daily charge rate measured during the most recent compliance test demonstrating compliance with all applicable emission limitations;~~

~~(ii) minimum pressure drop across the wet scrubber, which shall be measured continuously, recorded every 15 minutes, and calculated as 90 percent of:~~

~~(I) the average pressure drop across the wet scrubber measured during the most recent performance test demonstrating compliance with the particulate matter emission limitations, or~~

~~(II) the average amperage to the wet scrubber measured during the most recent performance test demonstrating compliance with the particulate matter emission limitations;~~

~~(iii) minimum scrubber liquor flow rate, which shall be measured continuously, recorded every 15 minutes, and calculated as 90 percent of the average liquor flow rate at the inlet to the wet scrubber measured during the most recent compliance test demonstrating compliance with all applicable emission limitations; and~~

~~(iv) minimum scrubber liquor pH, which shall be measured continuously, recorded every 15 minutes, and calculated as 90 percent of the average liquor pH at the inlet to the wet scrubber measured during the most recent compliance test demonstrating compliance with all applicable emission limitations.~~

~~(B) A three hour rolling average shall be used to determine if operating parameters in Subparts (A)(i) through (A)(iv) of this Subparagraph have been met.~~

~~(C) The owner or operator of the CISWI unit shall meet the operating limits established during the initial performance test on the date the initial performance test is required or completed.~~

(3) If ~~a fabric filter is used to comply with the emission limitations, then it shall be operated as specified in 40 CFR 60.2675(c);~~ an air pollution control device other than a wet scrubber, activated carbon sorbent injection, selective noncatalytic reduction, fabric filter, electrostatic precipitator, or dry scrubber is used to comply with this Rule or if emissions are limited in some other manner, including mass balances, to comply with the emission standards of Paragraph (e)(1) of this Rule, the owner or operator shall petition the Director for specific operating limits that shall be established during the initial performance test and continuously monitored thereafter.

(A) The initial performance test shall not be conducted until after the Director approves the petition.

(B) All the provisions of 40 CFR 60.2680 shall apply to the petition.

(C) The Director shall approve the petition upon finding that the requirements of 40 CFR 60.2680 have been satisfied and that the proposed operating limits will ensure compliance with the emission standards in Paragraph (e)(1) of this Rule.

~~(4) If an air pollution control device other than a wet scrubber is used or if emissions are limited in some other manner to comply with the emission standards of Paragraph (e) of this Rule, the owner or operator shall petition the Director for specific operating limits that shall be established during the initial performance test and continuously monitored thereafter. The initial performance test shall not be conducted until after the Director approves the petition. The petition shall include:~~

~~(A) identification of the specific parameters to be used as additional operating limits;~~

~~(B) explanation of the relationship between these parameters and emissions of regulated pollutants, identifying how emissions of regulated pollutants change with changes in these parameters, and how limits on these parameters will serve to limit emissions of regulated pollutants;~~

~~(C) explanation of establishing the upper and lower limits for these parameters, which will establish the operating limits on these parameters;~~

~~(D) explanation of the methods and instruments used to measure and monitor these parameters, as well as the relative accuracy and precision of these methods and instruments;~~

~~(E) identification of the frequency and methods for recalibrating the instruments used for monitoring these parameters.~~

~~The Director shall approve the petition if he finds that the requirements of this Subparagraph have been satisfied and that the proposed operating limits will ensure compliance with the emission standards in Paragraph (e) of this Rule.~~

(g) Test Methods and Procedures.

(1) For the purposes of this Paragraph, "Administrator" in 40 CFR 60.8 means "Director".

(2) The test methods and procedures described in ~~Section~~ 15A NCAC 02D .2600, ~~.2600 of this Subchapter,~~ in Tables 6 through 9 of 40 CFR 60 Subpart DDDD, ~~Part 60 Appendix A, 40 CFR Part 61 Appendix B,~~ in 40 CFR 60.2670(b) and 40 CFR 60.2690 shall be used to determine compliance with emission standards in Paragraph (e)(1) of this Rule. ~~Method 29 of 40 CFR Part 60 shall be used to determine emission standards for metals. However, Method 29 shall be used to sample for chromium (VI), and SW-846 Method 0060 shall be used for the analysis.~~

(3) Compliance with the opacity limit in Paragraph (e)(2) of this rule shall be determined using 40 CFR 60 Appendix A-4 Test Method 9.~~All performance tests shall consist of a minimum of three test runs conducted under conditions representative of normal operations. Compliance with emissions standards under Subparagraph (e)(1), (3) through (5), and (7) through (11) of this Rule shall be determined by averaging three one-hour emission tests. These tests shall be conducted within 12 months following the initial performance test and within every twelve month following the previous annual performance test after that.~~

(h) Initial Compliance Requirements.

(1) The owner or operator of a CISWI unit subject to this Rule shall demonstrate initial compliance with the emission limits in Paragraph (e)(1) of this Rule and establish the operating standards in Paragraph (f) of this Rule according to the provisions in 40 CFR 60.2700 through 40 CFR 60.2706. If an owner or operator commences or recommences combusting a solid waste at an existing combustion unit at any commercial or industrial facility, the owner or operator shall comply with the requirements of this Paragraph.

~~(4)~~(2) The owner or operator of a CISWI unit subject to this rule shall conduct an initial performance test ~~as specified in 40 CFR 60.8~~ pursuant to 40 CFR 60.2670, 40 CFR 60.2690 and Paragraph (g) of this Rule. ~~to determine compliance with the emission standards in Paragraph (e) of this Rule and to establish operating standards using the procedure in Paragraph (f) of this Rule.~~ The initial performance test must be conducted no later than 180 days after February 7, 2018 or according to 40 CFR 60.2705(b) or (c). The use of the bypass stack during a performance test shall invalidate the performance test. The initial performance test shall be used to:

(A) determine compliance with the emission standards in Paragraph (e)(1) of this Rule;

(B) establish compliance with any opacity operating limits in 40 CFR 60.2675(h);

(C) establish the kiln-specific emission limit in 40 CFR 60.2710(y), as applicable; and

(D) establish operating limits using the procedures in 40 CFR 60.2675 or 40 CFR 60.2680 and in Paragraph (f) of this Rule.

(3) The owner or operator of a CISWI unit subject to this Rule shall also conduct:

(A) a performance evaluation of each continuous emissions monitoring system (CEMS) or continuous monitoring system within 60 days of installation of the monitoring system; and

(B) an initial air pollution control device inspection no later than 180 days after February 7, 2018 pursuant to 40 CFR 60.2706.

(i) Continuous Compliance Requirements.

(1) The owner or operator of a CISWI unit subject to this Rule shall demonstrate continuous compliance with the emission limits in Paragraph (e)(1) of this Rule and the operating standards in Paragraph (f) of this Rule according to the provisions in 40 CFR 60.2710 through 40 CFR 60.2725.

(2) If an existing CISWI unit that combusted a fuel or non-waste material commences or recommences combustion of solid waste, the owner or operator;

(A) is subject to the provisions of 40 CFR 60 Subpart DDDD as of the first day solid waste is introduced or reintroduced into the combustion chamber and this date constitutes the effective date of the fuel-to-waste switch;

(B) shall complete all initial compliance demonstrations for any Section 112 standards that are applicable to the facility before commencing or recommencing combustion of solid waste; and

(C) shall provide 30 days prior notice of the effective date of the waste-to-fuel switch identifying the parameters listed in 40 CFR 60.2710(a)(4)(i) through (v).

(3) Pursuant to 40 CFR 60.2710(v), the use of a bypass stack at any time is an emissions standards deviation for particulate matter, hydrogen chloride, lead, cadmium, mercury, nitrogen oxides, sulfur dioxide, and dioxin/furans.

~~(5)~~(4) The owner or operator of ~~the~~ a CISWI unit subject to this Rule shall conduct an annual performance test for the pollutants listed in Paragraph (e)(1) of this Rule, including opacity and fugitive ash, ~~particulate matter, hydrogen chloride, and opacity as specified in 40 CFR 60.8~~ to determine compliance with the emission standards given in 40 CFR 60 Subpart DDDD Tables 6 through 9. ~~for the pollutants in Paragraph (e) of this Rule.~~ The annual performance test must be conducted according to the provisions in Paragraph (g) of this Rule. Annual performance tests are not required if CEMS or continuous opacity monitoring systems are used to determine compliance.

(5) The owner or operator shall continuously monitor the operating parameters established in Paragraph (f) of this Rule, and as specified in 40 CFR 60.2710(c) and in 40 CFR 60.2735.

(6) The owner or operator of an energy recovery unit subject to this Rule shall only burn the same types of waste and fuels used to establish applicability to this Rule and to establish operating limits during the performance test.

(7) The owner or operator shall comply with the monitoring system-specific, unit-specific and pollutant-specific provisions pursuant to 40 CFR 60.2710(e) through (j), (m) through (u), and (w) through (y).

(8) The owner or operator shall conduct an annual inspection of any air pollution control device used to meet the emission limitations in this Rule as specified in 40 CFR 60.2710(k).

(9) The owner or operator shall develop and submit to the Director for approval a site-specific monitoring plan according to the requirements in 40 CFR 60.2710(l). This plan must be submitted at least 60 days before the initial performance evaluation of any continuous monitoring system. The owner or operator shall conduct a performance evaluation of each continuous monitoring system in accordance with the site-specific monitoring plan. The owner or operator shall operate and maintain the continuous monitoring system in continuous operation according to the site-specific monitoring plan.

(10) The owner or operator shall meet any applicable monitoring system requirements specified in 40 CFR 60.2710(m) through (u) and (w) through (y).

~~(6) If the owner or operator of CISWI unit has shown, using performance tests, compliance with particulate matter, hydrogen chloride, and opacity for three consecutive years, the Director shall allow the owner or operator of CISWI unit to conduct performance tests for these three pollutants every third year. However, each test shall be within 36 months of the previous performance test. If the CISWI unit continues to meet the emission standards for these three pollutants the Director shall allow the owner or operator of CISWI unit to continue to conduct performance tests for these three pollutants every three years.~~

~~(7) If a performance test shows a deviation from the emission standards for particulate matter, hydrogen chloride, or opacity, the owner or operator of the CISWI unit shall conduct annual performance tests for these three pollutants until all performance tests for three consecutive years show compliance for particulate matter, hydrogen chloride, or opacity.~~

~~(8) The owner or operator of CISWI unit may conduct a repeat performance test at any time to establish new values for the operating limits.~~

~~(9) The owner or operator of the CISWI unit shall repeat the performance test if the feed stream is different than the feed streams used during any performance test used to demonstrate compliance.~~

~~(10) If the Director has evidence that an incinerator is violating a standard in Paragraph (e) or (f) of this Rule or that the feed stream or other operating conditions have changed since the last performance test, the Director may require the owner or operator to test the incinerator to demonstrate compliance with the emission standards listed in Paragraph (e) of this Rule at any time.~~

~~(h)~~(j) Monitoring.

(1) The owner or operator of ~~an incinerator~~ a CISWI unit subject to ~~the requirements of~~ this Rule shall comply with the monitoring ~~monitoring, recordkeeping, and reporting~~ requirements in ~~Section~~ 15A NCAC 02D .0600 ~~of this Subchapter.~~and 40 CFR 60.2730 through 40 CFR 60.2735.

(2) For each continuous monitoring system required or optionally allowed pursuant to 40 CFR 60.2730, the owner or operator shall monitor and collect data according to 40 CFR 60.2735.

~~(2)~~(3) The owner or operator of ~~an incinerator~~ a CISWI unit subject to ~~the requirements of~~ this Rule shall establish, install, calibrate to manufacturers specifications, maintain, and operate:

~~(A) devices or methods for continuous temperature monitoring and recording for the primary chamber and, where there is a secondary chamber, for the secondary chamber;~~

~~(B)~~(A) devices or methods for monitoring the value of the operating parameters used to determine compliance with the operating parameters established under Paragraph (f)(2) of this ~~Rule;~~Rule as specified in 40 CFR 60.2730;

~~(C) a bag leak detection system that meets the requirements of 40 CFR 60.2730(b) if a fabric filter is used to comply with the requirements of the emission standards in Paragraph (e) of this Rule; and~~

~~(D)~~(B) ~~equipment~~ devices or methods necessary to monitor compliance with the ~~cite-specific~~ site-specific operating parameters established ~~under~~ pursuant to Paragraph ~~(f)(4)~~(f)(3) of this ~~Rule.~~Rule as specified by 40 CFR 60.2730(c).

~~(3) The Director shall require the owner or operator of a CISWI unit with a permitted charge rate of 750 pounds per hour or more to install, operate, and maintain continuous monitors for oxygen or for carbon monoxide or both as necessary to determine proper operation of the CISWI unit.~~

(4) To demonstrate continuous compliance with an emissions limit, a facility may substitute use of a CEMS, a continuous automated sampling system, or other device specified by 40 CFR 60.2730 for conducting the annual emissions performance test and for monitoring compliance with operating parameters as specified by 40 CFR 60.2730.~~The Director shall require the owner or operator of a CISWI unit with a permitted charge rate of 750 pounds per hour or less to install, operate, and maintain continuous monitors for oxygen or for carbon monoxide or both if necessary to determine proper operation of the CISWI unit.~~

(5) The owner or ~~/~~operator of a CISWI unit subject to this rule ~~an affected source~~ with a bypass stack shall install, calibrate (to manufacturers' specifications), maintain and operate a device or method for measuring the use of the bypass stack. including date, time and duration.

~~(5)~~(6) The owner or operator of ~~the~~ a CISWI unit subject to this Rule shall conduct all monitoring at all times the CISWI unit is operating, ~~except;~~except for;

(A) monitoring system malfunctions and associated ~~repairs;~~repairs as specified in 40 CFR 60.2735;

(B) monitoring system out-of-control periods as specified in 40 CFR 60.2770(o);

(B)(C) required monitoring system quality assurance or quality control activities including calibrations checks and required zero and span adjustments of the monitoring ~~system.~~system; and

(D) any scheduled maintenance as defined in the site-specific monitoring plan pursuant to Subparagraph (i)(9) of this Rule.

~~(6)~~(7) The data recorded during monitoring malfunctions, out of control periods, ~~associated repairs, and~~repairs associated with malfunctions or out of control periods, required quality assurance or quality control activities, and site-specific scheduled maintenance shall not be used in assessing compliance with the operating standards in Paragraph (f) of this Rule. Owners and operators of a CISWI unit subject to this Rule must use all the data collected during all other periods, including data normalized for above scale readings, in assessing the operation of the control device and associated control system.

(8) Owners or operators of a CISWI unit subject to this Rule are required to effect monitoring system repairs in response to monitoring system malfunctions or out-of-control periods and to return the monitoring system to operation as expeditiously as practicable.

(9) Except for periods of monitoring system malfunctions or out-of-control periods, repairs associated with monitoring system malfunctions or out-of-control periods, and required monitoring system quality assurance or quality control activities including, as applicable, calibration checks and required zero and span adjustments, failure to collect required monitoring data is a deviation of the monitoring requirements.

(k) Deviations, Malfunctions, and Out of Control Periods.

(1) Owners and operators of a CISWI unit subject to this Rule shall report any deviations as defined in 40 CFR 60.2875, including, but not limited to, the instances listed in Parts (A) through (D) of this Subparagraph.

(A) Deviation from operating limits in Table 3 of 40 CFR 60 Subpart DDDD or a deviation from other operating limits established pursuant to Paragraph (f), 40 CFR 60.2675(c) through (g) or 40 CFR 60.2680 including, but not limited to, any recorded 3-hour average parameter level is above the established maximum operating limit or below the established minimum operating limit;

(B) Deviation from the emission limitations established pursuant to Tables 6 through 9 of 40 CFR 60 Subpart DDDD detected through monitoring or during a performance test;

(C) Deviation from the CISWI operator qualification and accessibility requirements established pursuant to 40 CFR 60.2635; or

(D) Deviation from any term or condition included in the operating permit of the CISWI unit.

(2) Owners and operators of a CISWI unit subject to this Rule shall submit any required deviation reports as specified by Paragraph (l) of this Rule. The deviation report shall be submitted by August 1 of the year for data collected during the first half of the calendar year (January 1 to June 30), and

by February 1 of the following year for data collected during the second half of the calendar year (July 1 to December 31). In addition, the owner and operator shall report the deviation in the annual report as specified by Paragraph (l) of this Rule.

(3) Owners and operators of a CISWI unit subject to this Rule shall report any malfunctions, as defined in 40 CFR 60.2875, in the annual report as specified by Paragraph (j) and Paragraph (l) of this Rule.

(4) Owners and operators of a CISWI unit subject to this Rule shall report any periods during which any continuous monitoring system, including a CEMS, was out of control in the annual report as specified by Paragraph (j) and Paragraph (l) of this Rule.

~~(i)~~(l) ~~Recordkeeping.~~ Recordkeeping and Reporting.

(1) The owner or operator of a CISWI unit subject to this rule shall maintain records required by this Rule on site in either paper copy or electronic format that can be printed upon request for a period of five ~~years.~~years, unless an alternate has been approved by the Director.

(2) Combustion units that are exempt units pursuant to Paragraph (b) of this rule are subject to the recordkeeping and reporting requirements in 40 CFR 60.2740(u) through 40 CFR 60.2740(w).

~~(2)~~(3) The owner or operator of a CISWI unit subject to this rule shall maintain all records required ~~under~~ by 40 CFR ~~60.2740.~~60.2740 through 40 CFR 60.2800.

~~(3)~~(4) The owner or operator of a CISWI unit subject to this Rule shall submit the following reports with the required information and by the required due dates as specified in Table 5 of 40 CFR 60, Subpart ~~DDDD the following reports:~~DDDD:

(A) ~~Waste Management Plan;~~ waste management plan as specified in 40 CFR 60.2755;

(B) initial test ~~report,~~ report as specified in 40 CFR 60.2760;

(C) annual report as specified in 40 CFR ~~60.2770;~~60.2765 and 40 CFR 60.2770;

(D) emission limitation or operating limit deviation report as specified in 40 CFR 60.2775 and 40 CFR 60.2780;

(E) qualified operator deviation notification as specified in 40 CFR 60.2785(a)(1);

(F) qualified operator deviation status report, as specified in 40 CFR 60.2785(a)(2);

(G) qualified operator deviation notification of resuming operation as specified in 40 CFR 60.2785(b).

~~(4) The owner or operator of the CISWI unit shall submit a deviation report if:~~

~~(A) any recorded three-hour average parameter level is above the maximum operating limit or below the minimum operating limit established under Paragraph (f) of this Rule;~~

~~(B) the bag leak detection system alarm sounds for more than five percent of the operating time for the six-month reporting period; or~~

~~(C) a performance test was conducted that deviated from any emission standards in Paragraph (e) of this Rule.~~

~~The deviation report shall be submitted by August 1 of the year for data collected during the first half of the calendar year (January 1 to June 30), and by February 1 of the following year for data collected during the second half of the calendar year (July 1 to December 31).~~

(5) The owner or operator shall maintain CISWI unit operator records as specified by 40 CFR 60.2740(g) through (i), 40 CFR 60.2660 and 40 CFR 60.2665. If the CISWI unit has been shut down by the Director pursuant to 40 CFR 60.2665(b)(2), due to failure to provide an accessible qualified operator, the owner or operator shall notify the Director that the operations are resumed once a qualified operator is accessible.

~~(5)~~(6) The owner or operator of ~~the~~ a CISWI unit subject to this Rule may request changing semiannual or annual reporting dates as specified in this Paragraph, and the Director may approve the request change using the procedures specified in 40 CFR 60.19(c).

~~(6)~~(7) Reports ~~required under this Rule shall be submitted electronically or in paper format, postmarked on or before the submittal due dates.~~ shall be submitted to US EPA as specified in 40 CFR 60.2795.

(A) The owner or operator of the CISWI unit shall submit initial, annual and deviation reports electronically on or before the submittal due dates as specified in 40 CFR 60.2795(a). Submit the reports to the EPA via the Compliance and Emissions Data Reporting Interface (CEDRI) which can be accessed through the EPA's Central Data Exchange (CDX) (https://cdx.epa.gov/).)Reports required under this Rule shall be submitted electronically or in paper format, postmarked on or before the submittal due dates.

(B) The owner or operator shall submit results of each performance test and CEMS performance evaluation within 60 days of the test or evaluation following the procedure specified in 40 CFR 60.2795(b).

(i) For data collected using test methods supported by the EPA's Electronic Reporting Tool (ERT) as listed on the EPA's ERT Web site (https://www3.epa.gov/ttn/chief/ert/ert_info.html) at the time of the test, the owner or operator must submit the results of the performance test to the EPA via the CEDRI.

(ii) For data collected using test methods that are not supported by the EPA's ERT as listed on the EPA's ERT Web site at the time of the test, the owner or operator shall submit the results of the performance test to the Director.

~~(7) If the CISWI unit has been shut down by the Director under the provisions of 40 CFR 60.2665(b)(2), due to failure to provide an accessible qualified operator, the owner or operator shall notify the Director that the operations are resumed once a qualified operator is accessible.~~

~~(j) Excess Emissions and Start-up and Shut-down. All incinerators subject to this Rule shall comply with 15A NCAC 2D .0535, Excess Emissions Reporting and Malfunctions, of this Subchapter.~~

~~(k)~~(m) Operator Training and Certification.

(1) The owner or operator of the CISIWI unit subject to this Rule shall not allow the CISWI unit to operate at any time unless a fully trained and qualified CISWI unit operator is accessible, either at the facility or ~~available~~ can be at the facility within one hour. The trained and qualified CISWI unit operator may operate the CISWI unit directly or be the direct supervisor of one or more ~~CISWI unit operators.~~ plant personnel who operate the unit.

(2) Operator training and qualification shall be obtained by completing the requirements of 40 CFR 60.2635(c) by the later of:

(A) six month after CISWI unit startup; ~~or~~

(B) six month after an employee assumes responsibility for operating the CISWI unit or assumes responsibility for supervising the operation of the CISWI ~~unit.~~unit; or

(C) February 7, 2018.

(3) Operator qualification is valid from the date on which the training course is completed and the operator passes the examination required in 40 CFR 60.2635(c)(2).

(4) Operator qualification shall be maintained by completing an annual review or refresher course ~~covering:~~covering, at a minimum, the topics specified in 40 CFR 60.2650(a) through (e).

~~(A) update of regulations;~~

~~(B) incinerator operation, including startup and shutdown procedures, waste charging, and ash handling;~~

~~(C) inspection and maintenance;~~

~~(D) responses to malfunctions or conditions that may lead to malfunction;~~

~~(E) discussion of operating problems encountered by attendees.~~

(5) Lapsed operator qualification shall be renewed by:

(A) completing a standard annual refresher course as specified in Subparagraph (4) of this Paragraph for a lapse less than three years, ~~and~~ or

(B) repeating the initial qualification requirements as specified in Subparagraph (2) of this Paragraph for a lapse of three years or more.

(6) The owner or operator of ~~the~~ a CISWI ~~CISIWI~~ unit subject to this rule shall:

(A) have documentation specified in 40 CFR 60.2660(a)(1) through (10) and (c)(1) through (c)(3) available at the facility and accessible for all CISWI unit operators and are suitable for inspection upon request;

(B) establish a program for reviewing the documentation specified in Part (A) of this Subparagraph with each CISWI unit ~~operator:~~operator such that the initial review of the documentation specified in Part (A) of this Subparagraph shall be conducted no later than February 7, 2018 or no later than six months after an employee assumes responsibility for operating the CISWI unit or assumes responsibility for supervising the operation of the CISWI unit.

(C) Subsequent annual reviews of the documentation specified in Part (A) of this Subparagraph shall be conducted no later than twelve month following the previous review.

~~(i) the initial review of the documentation specified in Part (A) of this Subparagraph shall be conducted by the later of the two dates:~~

~~(I) six month after CISWI unit startup; or~~

~~(II) six month after an employee assumes responsibility for operating the CISWI unit or assumes responsibility for supervising the operation of the CISWI unit; and~~

~~(ii) subsequent annual reviews of the documentation specified in Part (A) of this Subparagraph shall be conducted no later than twelve month following the previous review.~~

(7) The owner or operator of ~~the~~ a CISIWI unit subject to this Rule shall meet one of the two criteria specified in 40 CFR 60.2665(a) and (b), depending on the length of time, if all qualified operators are temporarily not at the facility and not able to be at the facility within one hour.

~~(l)~~(n) Prohibited waste. The owner or operator of a CISIW subject to this Rule shall not incinerate any of the wastes listed in G.S. 130A-309.10(f1).

~~(m)~~(o) Waste Management Plan.

(1) The owner or operator of ~~the~~ a CISWI unit subject to this Rule shall submit a waste management plan to the Director that identifies in writing the feasibility and the methods used to reduce or separate components of solid waste from the waste stream in order to reduce or eliminate toxic emissions from incinerated waste.

(2) The waste management plan shall include:

(A) consideration of the reduction or separation of waste-stream elements such as paper, cardboard, plastics, glass, batteries, or metals; and the use of recyclable materials;

(B) a description of how the materials listed in G.S. 130A-309.10(f1) are to be segregated from the waste stream for recycling or proper disposal;

(C) identification of any additional waste management measures; and

(D) implementation of those measures considered practical and feasible, based on the effectiveness of waste management measures already in place, the costs of additional measures and the emissions reductions expected to be achieved and the environmental or energy impacts that the measures may have.

~~(n) The final control plan shall contain the information specified in 40 CFR 60.2600(a)(1) through (5), and a copy shall be maintained on site.~~

History Note: *Authority G.S. 143-215.3(a)(1); 143-215.65; 143-215.66; 143-215.107(a)(4),(5); 40 CFR 60.215(a)(4);*
Eff. August 1, 2002;

Amended Eff. June 1, 2008; January 1, 2005.