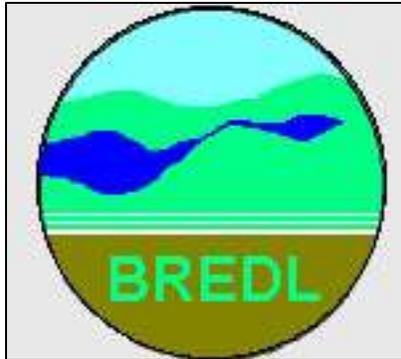


# Blue Ridge Environmental Defense League



## **Medical Waste in NC: The need to reduce incineration by more effective waste segregation and use of non-incineration technologies**

A white paper submitted to the NC Environmental Management Commission

By Blue Ridge Environmental Defense League

Carolyn Cole  
David Mickey

Public Release Date: January 24, 2011

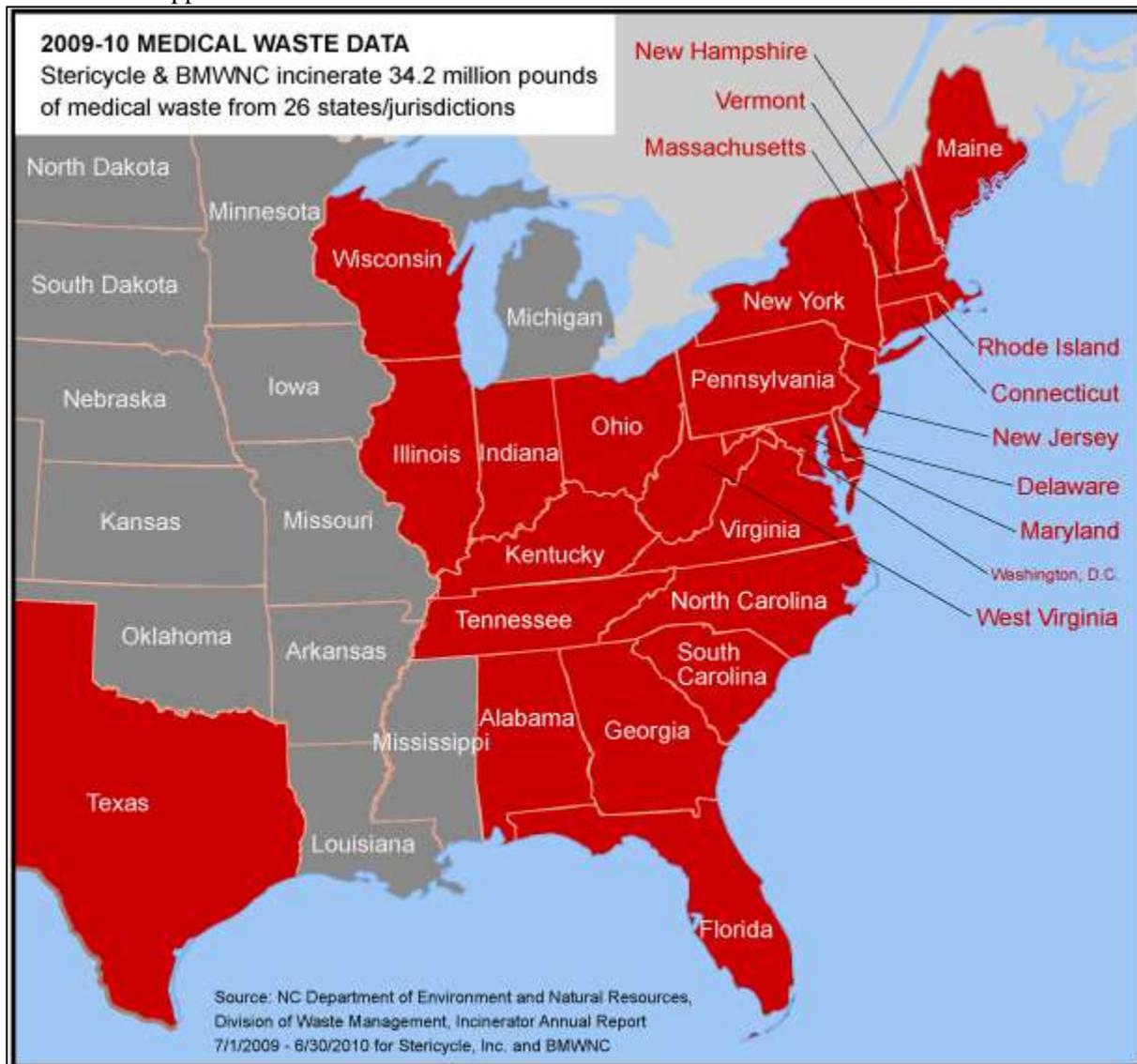
### Abstract

The Blue Ridge Environmental Defense League respectfully proposes that the state's Environmental Management Commission (EMC) take leadership to reverse the ongoing trend of increasing medical waste incineration in our state. We urge the EMC to promote more effective medical waste segregation practices among health care facilities (in- and out-of-state), encourage non-incineration technologies, increase coordination and cooperation among and between different divisions in NCDENR around the issues of medical waste and Title V permit processes, and maintain an ongoing presence and oversight regarding progress in reducing medical waste incineration to the minimum necessary.

North Carolina is now a major center for commercial medical waste incineration in the United States. Last year twenty-six states sent their waste to North Carolina and thirty-four million pounds was incinerated.<sup>1</sup> This number is likely to continue to rise in the future. For the sake of our citizens' health and North Carolina's environment, the Blue Ridge Environmental Defense League urges the State of North Carolina through its Environmental Management Commission to focus on reducing medical waste incineration as a priority issue.

The Blue Ridge Environmental Defense League respectfully calls upon the Environmental Management Commission to take leadership to address the increasing volume of medical waste incineration in our state. We believe the focus of intervention should be on strategies that support and promote more effective waste segregation by health care facilities, as well as an increase in the use of non-incineration technologies for the majority of medical waste that can be safely disposed of without incineration.

Improved waste segregation coupled with reducing waste at the source, reuse and recycling all support sustainability principles that will reduce incineration significantly. Incineration has a number of deleterious effects on the health of North Carolina citizens and the environment, particularly for those who reside in communities adjacent to the incinerators. We believe that using non-incineration methods of waste treatment where incineration is not required will improve the public's health, well-being, and productivity. Savings will accrue in health care dollars (public and private), while health care providers should realize some cost savings as well. We offer this document in support of those ends.



**FIGURE 1.** States that sent medical waste to North Carolina for incineration in 2009-2010

## **How has North Carolina become a major hub for medical waste incineration from half of the United States?**

In 1996 the number of medical waste incinerators in the United States dropped from over 2,300 to the 56 that operate today.<sup>2</sup> Their declining numbers resulted largely due to hospitals shutting down their on-site incinerators over cost issues in meeting new federal air standards regulations. Hospitals replaced their incinerator systems by installing an alternative technology (autoclaving) and/or outsourcing their waste disposal, more frequently choosing the latter. Other factors in incinerator decline included states banning hospital medical waste incineration as well as successful citizen efforts against re-permitting incinerator facilities. Commercial medical waste handlers responded to this situation and a major industry in medical waste handling was born.

By 2002-2003, commercial waste handlers owned/operated 14 of the 57 remaining incinerators in the United States. Their capacities were large. Of all waste incinerated, their share of the market was 69.2%.<sup>3</sup>

In North Carolina the two already established commercial incinerator facilities (now owned by Stericycle and BMWNC) benefited considerably from these events. They also benefited from another trend, industry consolidation. The more fiscally healthy medical waste companies acquired smaller companies and established increasingly larger networks of customers. Such networks produced an expanding base that fed an increasing volume to their commercial incinerators. Stericycle, Inc., which owns two incinerators in Haw River, is regarded as an industry leader and consolidator, having made continuous acquisitions in its relatively short history. Industry consolidation continues today and increasing incinerator volume at Haw River reflects that.

Market consolidation and the local presence of three commercial incinerators in North Carolina gave strong market power to incineration over and above alternative technologies.<sup>4</sup> That market power continues today as is evident by the volume of waste and the wide sweep of states that generate waste destined for North Carolina incinerators (Figure 1 and Appendices A, B).

## **How much medical waste is being incinerated in North Carolina?**

In the 2009-2010 year, North Carolina's three commercial medical waste incinerators burned in excess of 34 million pounds. This volume resulted in nearly 12 million pounds of fly ash and bottom ash that was sent to landfills within our state. No less than 61% of this waste was shipped into NC from 25 other states. These figures represent what is now an established trend of importing increasingly more medical waste from out-of-state. During the past four years, out-of-state volume has increased from 54% to 61% of total waste incinerated.<sup>5</sup>

Medical waste generated within North Carolina is concerning as well. Due in part to the lower transportation costs, the convenience of having three commercial incinerators within our state, and a striking lack of commercial off-site alternatives; North Carolina health care facilities generated a large volume for incineration (over 13 million pounds in 2009-2010).<sup>6</sup>

The waste burned by NC health care facilities has reduced slightly in actual numbers over the past four years, from over fourteen million pounds to over thirteen million pounds.<sup>7</sup> This is good movement and the reasons for it would be useful to understand. However, these amounts are still sizable. For a further look into in-state medical waste incineration data and trends see Appendices A and D.

## **Is more waste being incinerated than is necessary?**

Yes. Prominent health care organizations such as Health Care Without Harm and Practice GreenHealth have long emphasized that incineration is used even when it is not indicated and that this results in an additional expense for hospitals as well as deleterious effects for public health and the environment.<sup>8</sup>

Incinerating beyond what is necessary was noted in a 2008 EPA sponsored study by Research Triangle Institute. "Only 2% to 3% of total hospital waste has no treatment alternative to incineration. This does not mean that only

2% to 3% of total hospital waste will be incinerated. Often, inadequate waste segregation due to poor waste management techniques and lack of staff training will result in more waste sent to incinerators than necessary.”<sup>9</sup>

The EPA reported waste segregation issues that promote incineration (based on a Stericycle docket submission): “Commercial HMIWI treat and dispose of waste from generators who do not have a large enough incentive to segregate their own waste.”<sup>10</sup>

Stericycle reported through CHWMEG, Inc., an industry waste management group, that at its Haw River, NC facility 40% of what is incinerated is ‘regular medical waste’ (i.e., not regulated) and that “Regular medical waste could be treated in an autoclave, but generators who prefer treatment by incineration send the waste to the Haw River facility.”<sup>11</sup>

North Carolina health care facilities have a definite incineration incentive. An EPA report points out that “More often than not, hospitals will prefer to patronize nearby incinerator units that result in lower transportation costs. Consequently, these commercial facilities have market power in regions that do not have strong incineration alternatives; only North Carolina has more than one commercial HMIWI facility.”<sup>12</sup>

Finally, the two large commercial autoclaves in North Carolina currently owned by Stericycle and BMWNC operate without shredders. The lack of shredders means that hospitals cannot use those autoclaves for the myriad of items that contain patient identifying data (HIPAA compliance). Most of these items could otherwise be safely processed by autoclave but instead, they are most likely sent to incineration.

It is clear that more waste than necessary is currently being incinerated in our state.

### **What is the future for medical waste incineration in our state?**

It is highly likely that incineration will increase in North Carolina. The factors that lead us to this conclusion are as follows:

- 1) All hospitals treat an increasing ‘baby boomer’ patient population and medical waste in general will increase;
- 2) Hospitals that use commercial waste handlers, as mentioned earlier,<sup>13</sup> tend to do less waste segregation and so are more likely to continue to incinerate unnecessarily. Additionally, cultural shifts are often necessary within institutions that pursue more stringent waste segregation and this becomes a barrier to change when incentives are not strong;<sup>14</sup>
- 3) The absence of shredders on the commercial autoclaves operated in North Carolina by both Stericycle and BMWNC support continued incineration over autoclaving;
- 4) Ongoing acquisitions of smaller waste companies by Stericycle, Inc. will continue and will add volume to its two Haw River incinerators;
- 5) Further predicted incinerator closings across the county will increase the loads of the fourteen commercial incinerators currently in the US.<sup>15</sup> Since North Carolina is home to three of those fourteen incinerators, we will continue to bear a disproportionate share;
- 6) Stericycle and BMWNC incinerator facilities are not operating at their maximum permitted amounts. They can increase their waste input without further action by the state.

### **Are there any trends that point toward less incineration?**

Yes. Hospitals are increasingly being called upon by regulation and by practice standards to segregate their waste further into a number of different waste streams.<sup>16</sup> Changing waste disposal regulations, cultural shifts toward more sustainable practices, coupled with leadership from national groups such as Healthcare Without Harm and Practice GreenHealth are changing habits and moving health care facilities closer to the 3R priorities (reduce, reuse, recycle) and away from incineration. Health care facility operations now can reference the “Green Guide for Health Care,<sup>TM</sup>” a best practices guide that includes all aspects of waste management, including minimizing incinerator waste.<sup>17</sup>

These trends are not strong at present, but they can be supported and promoted within our state.

The cost of incinerating waste can act as a disincentive according to a recent EPA report, “As the cost of incineration increases, medical waste generators will most likely shift the methods used to treat medical waste by taking advantage of alternative treatment methods, such as autoclaving, as well as training staff to segregate waste more effectively (Krisiunas, 2008). Both trends would tend to reduce the share of hospital/medical/infectious waste being treated by incineration.”<sup>18</sup> It is not clear how much incinerator costs would have to rise before they reduce the volume of incineration in our state.

Hospitals that use on-site autoclaving are usually stricter in their waste segregation practices. Both these factors together will result in less waste for incineration.

A final and optimistic note: One outcome of the 2010 Stericycle Permit Renewal Public Hearing was a recommendation supporting incineration minimization. The 2010 Hearing Officer’s Report called for several divisions within NCDENR to host a meeting to discuss incinerator waste minimization and include the North Carolina Hospital Association and/or other waste generators as well as incinerator facility operators.<sup>19</sup> This is a step in the right direction because action on the part of the state to minimize incineration is clearly necessary.

(We applaud this recommendation and we urge that the state follow through on it. We do, however, believe that a more comprehensive effort is necessary to achieve change and we will discuss this later in this paper.)

### **Is there public concern about medical waste incineration?**

Yes, a considerable amount of public concern and interest exists. Three public hearings were held in 2010 regarding these incinerator facilities. Two hearings related to Title V permit renewals for Stericycle and BMWNC. The third hearing was held by the Environmental Management Commission (EMC) regarding incorporation of the EPA’s new rules. In each of these hearings, large numbers of the public spoke with strong concerns about our state’s approach to incineration, the public health risks, and the environmental impact of incineration. The EMC Hearing Officer produced a report of some 450 pages, which included lengthy public comments and several petitions.<sup>20</sup> Sixteen local government units passed resolutions which detailed concerns about medical waste incineration and urged an early adoption date of October 2012 for stricter EPA standards.<sup>21</sup> Two citizen interest groups formed in 2010 with the goal of ending medical waste incineration in North Carolina (Clean Air Now (CAN) in Alamance County and Citizens for a Healthy Environment (CHE) in Mecklenburg County). Clearly there is strong public concern and interest in reducing the amount of medical waste that is incinerated.

### **EMC leadership can address the issues**

We believe that the case has been made for the urgent need to promote more effective waste segregation and reverse the rising volumes of medical waste incineration in our state. We respectfully request that the Environmental Management Commission provide leadership in this effort.

To promote solutions for the core problem that is waste segregation, we believe that the EMC could initiate a special planning process that includes relevant NCDENR divisions (Air Quality, Solid Waste, Hazardous Waste, Environmental Assistance and Outreach, etc.) as well as non-governmental stakeholders. The latter would include participation from hospitals who are the primary waste generators (and other significant generators), different waste disposal vendors, plus the public and environmental groups. Public and environmental groups have a strong interest in seeing incineration minimized and have made significant contributions to understanding this issue. We urge that they be given a place at the stakeholders’ table. Recommendations from the planning group would be made to the EMC. All stakeholders would take part in developing the recommendations.

Non-incineration technologies play an important role by offsetting waste destined for incineration. They go hand in hand with effective waste segregation. There are a number of ways to promote interest in these technologies through educational efforts, conferences with vendor fairs, and the like. Input from such national groups as Practice GreenHealth™ would be valuable in this area.

Another area where the EMC could facilitate change is coordination between and among the relevant divisions/departments within NCDENR that have jurisdiction for incinerator facilities. Questions arise that overlap divisions and some structured coordination could be beneficial at these times. The need for this can be seen, for example, in the Title V planning process. While Title V permits are issued by the Division of Air Quality, other divisions/sections within NCDENR (Solid Waste, Hazardous Waste, Water Quality, etc.) have expertise, jurisdiction and, perhaps, mandates that are different from Air Quality. What is permitted to be incinerated in the Title V process is an Air Quality decision, but still involves questions that cross Divisions. For example, the Solid Waste Division mandates recycling to have priority over incineration,<sup>22</sup> but Title V permits currently specifically allow the incineration of paper documents.

Finally, we request that the problems and issues outlined in this report be monitored by the EMC and that the EMC maintain an ongoing presence and oversight regarding progress in reducing medical waste incineration to the minimum necessary.

### **Further considerations toward improved waste segregation among health care facility waste generators**

There are a number of considerations which need to be taken into account in any such undertaking and we offer more detail on these:

#### **Consideration #1**

There are significant issues relating to medical waste incineration that would benefit by having all stakeholders at the table. Managing medical waste is an effort carried out first and foremost by the health care facilities that generate the waste. As major stakeholders in this issue, they must be part of the conversation. They have been noticeably absent. The stakeholder group should be a broad one and include vendors who provide alternatives to incineration, as well as the public and environmental groups which have shown a strong interest and who have become very familiar with the issues, making contributions to understanding the issues. It should not be limited to incineration treatment providers, but should provide input from multiple vendors. It is time to take a fresh look at this issue.

#### **Consideration #2**

There may be logical starting points, or areas within our state where attention may yield more immediate benefits. We offer data showing the contributions to incineration by major county-based generators within North Carolina. For example, Durham County leads the state in generating medical waste for incineration. Some counties with a relatively small population produce a substantial portion of the total waste.<sup>23</sup> Counties with relatively little waste, but which include larger health care facilities would be another point for reference.

Additionally, there are hospitals within our state that have made substantial efforts to minimize incineration. Understanding their experience would be valuable.

#### **Consideration #3**

Out-of-state waste generators are more difficult to influence. Yet their incineration growth rate is far and above our in-state facilities. Strategies to promote stricter waste segregation in this group are not immediately apparent. However, a disincentive to incineration is increased costs. Attaching a 'tipping fee' to boxes sent to incineration would be such a disincentive and would have to be applied to all boxes, both in-state and out-of-state. The proceeds could be applied to the state's health care funds or programs to promote medical waste reduction.

#### **Consideration #4**

Changes to the Title V Permit process as it occurs in our state may be helpful: Within state regulations there is an established hierarchy of methods of managing solid waste that precedes incineration.<sup>24</sup> That order is:

- (1) Waste reduction at the source;
- (2) Recycling and reuse;
- (3) Composting;

Consider that Title V Permit decisions regarding what items may be burned by an incineration facility should be subject to the state's solid waste management hierarchy. DENR would address how it can promote this hierarchy both within/across its Divisions for guidance within our state as well as for other states which generate medical waste.

#### **Consideration #5**

Changes to the Title V Permit process in our state may be helpful: Consider that different divisions within the NCDENR would sign off on aspects of Title V permits that overlap their 'jurisdiction.' Coordinated input and agreement on key components in medical waste incineration might draw from DAQ, Solid Waste, Pollution Prevention, hazardous waste, etc. Such actions would likely consider such currently permitted items as paper and plastics, non-hazardous trace chemotherapy waste, international garbage, etc.

#### **Consideration 6**

Don't re-invent the wheel. NCDENR has limited resources. Add to the expertise already existing in our state by tapping national groups that have a broad base of experience. Promote participation from organizations and resources that assist health care facilities manage their waste according to a 'best practices approach.' Notable among them are Practice GreenHealth, Healthcare Without Harm (HCWH), and The Green Guide for Health Care.<sup>TM</sup> For example, Practice GreenHealth offers a "waste tracker" so that hospitals can manage their waste more efficiently. Practice GreenHealth also offers workshops on 'Greening the Operating Room.' (Operating rooms and Labor & Delivery sections can be 30% or more of a hospital's total waste.) HCWH works with hospitals to reduce the amount of all waste generated, to reduce the toxicity of waste by making smarter purchasing decisions upstream, and by properly segregating and recycling waste. The Green Guide for Health Care<sup>TM</sup> provides best practices guidance for waste management coupled with educational components and includes incineration minimization.

#### **Consideration #7**

Promote the conversation widely. This could include stakeholders planning a 'state of the art' best practices conference on medical waste management, ongoing focused meetings, etc. Utilize the state's AHEC system to reach out to health care personnel at all levels. Involve the NC Hospital Association, key health care professional groups, etc.

#### **Consideration #8**

Finally, we submit a list of questions/comments on medical waste incineration reduction which may be of use in this discussion. They are included as Appendix G and have been submitted separately as well to the Environmental Management Commission.

#### **Summary**

The Blue Ridge Environmental Defense League proposes that the state's Environmental Management Commission take leadership in promoting more effective medical waste segregation practices among health care facilities (in- and out-of-state), promote non-incineration technologies, increase coordination and cooperation among and between different divisions in NCDENR around the issues of medical waste and the Title V permit processes, and maintain an ongoing presence and oversight regarding progress in reducing medical waste incineration trends. Data and references have been included as well as supporting documentation.

APPENDIX A

**Commercial Medical Waste Incineration in NC (Stericycle & BMWNC Combined)**

Time period	Pounds	Pounds generated from outside of NC	Pounds generated from within NC	% generated from NC	Pounds sent to Landfill	% of total to landfill
7/1/2009-6/30/2010	34,220,340	21,000,000	13,220,340	39%	11,993,220	35%
7/1/2008-6/30/2009	35,036,000	21,037,899	13,998,101	40%	11,784,100	34%
7/1/2007-6/30/2008	30,604,437	17,012,386	13,594,051	44%	9,887,420	32%
7/1/2006-6/30/2007	31,112,860	16,748,540	14,364,340	46%	9,137,880	29%

**Medical Waste Incinerated at Stericycle, Haw River, NC\***

Time period	Pounds	Pounds generated from outside of NC	Pounds generated from within NC	% generated from NC	Pounds sent to Landfill	% of total to landfill
7/1/2009-6/30/2010	27,241,760	14,928,120	12,313,640	45%	9,863,740	36%
7/1/2008-6/30/2009	26,253,660	12,800,079	13,453,581	51%	9,238,500	35%
7/1/2007-6/30/2008	21,204,437	9,022,386	12,182,051	57%	7,141,420	34%
7/1/2006-6/30/2007	21,975,960	10,230,180	11,745,780	53%	6,095,580	28%
7/1/2005-6/30/2006	24,179,460	9,292,260	14,887,200	62%	6,911,920	29%
7/1/2004-6/30/2005	25,483,600	9,422,580	16,061,020	63%	7,436,020	29%
7/1/2003-6/30/2004	24,242,522	8,290,762	15,951,760	66%	8,050,400	33%
7/1/2002-6/30/2003	24,307,839	8,598,908	15,708,931	65%	7,136,480	29%
7/1/2001-6/30/2002	26,953,200	10,641,000	16,312,200	61%	7,004,480	26%

\*Source: NCDENR. Division of Waste Management. INCINERATOR Facility Annual Reports for Stericycle, Inc. 7/2001-6/2010.

**Medical Waste Incinerated at BMWNC, Matthews, NC\*\***

Time period	Pounds	Pounds generated from outside of NC	Pounds generated from within NC	% generated from NC	Pounds sent to Landfill	% of total to landfill
7/1/2009-6/30/2010	6,978,580	6,071,880	906,700	13%	2,129,480	31%
7/1/2008-6/30/2009	8,782,340	8,237,820	544,520	6%	2,545,600	29%
7/1/2007-6/30/2008	9,400,000	7,990,000	1,412,000	15%	2,746,000	29%
7/1/2006-6/30/2007	9,136,900	6,518,360	2,618,560	29%	3,042,300	33%

\*\*Source: NCDENR. Division of Waste Management. INCINERATOR Facility Annual Reports for BMWNC. 7/2006-6/2010.

APPENDIX B

**26 states that sent medical waste for incineration to Stericycle and BMWNC in 2009-2010**

Alabama  
Connecticut  
Delaware  
Florida  
Georgia  
Illinois  
Indiana  
Kentucky  
Maine  
Maryland  
Massachusetts  
New Hampshire  
New York  
New Jersey  
North Carolina  
Ohio  
Pennsylvania  
Rhode Island  
South Carolina  
Tennessee  
Texas  
Vermont  
Virginia  
Washington, DC  
West Virginia  
Wisconsin

APPENDIX C

**Sixteen local governments that passed resolutions in support of an October 6, 2012 date for enforcement of the EPA Rules of October 6, 2009.**

[Mecklenburg County;](#)  
[Orange County;](#)  
[Chatham County;](#)  
Union County;  
[Durham County;](#)  
[Carrboro Town Council;](#)  
[Town of Haw River;](#)  
[City of Mebane;](#)  
[Town of Hillsborough;](#)  
[Town of Chapel Hill;](#)  
[Town of Green Level;](#)  
[Town of Stallings;](#)  
[Town of Gibsonville;](#)  
Town of Swepsonville;  
[City of Durham](#)

APPENDIX D

**NC Counties that were the largest contributors to medical waste incineration in NC in 2009 – 2010**

A breakdown of in-state figures by counties shows Durham County as the leader in waste generation (2.8 million pounds), followed Wake, Guilford, Alamance, and Orange. Last year Durham County generated 10.2% of Stericycle’s total incinerated waste and this amounted to 22.5% of all the waste sent to Stericycle’s incinerators from North Carolina in that same year.

	POUNDS
Durham	2,772,179
Wake	1,647,189
Guilford	1,610,599
Alamance	1,023,377
Orange	915,408
Forsyth	858,548
Pitt	834,825
Cumberland	650,124
Mecklenburg	330,349
Data is for Stericycle and BMWNC combined and taken from the NCDENR Annual Incinerator Facilities Reports 2009-2010.	

Breakdown by Incineration facility and county:

	POUNDS of medical waste sent to commercial incinerators in NC by selected counties 2009-2010		
	BMWNC	STERICYCLE	TOTALS
Durham	4,340	2,767,839	2,772,179
Wake	5,500	1,641,689	1,647,189
Guilford	171,980	1,438,619	1,610,599
Alamance	549,520	473,857	1,023,377
Orange	42,120	873,288	915,408
Forsyth	1,840	856,708	858,548
Pitt	0	834,825	834,825
Cumberland	300	650,124	650,424
Mecklenburg	69,780	260,569	330,349

## Regional Markets for Commercial Medical Waste Incinerators

QUOTED FROM: Heller, Katherine, Nourani, Vesall, & Braun, Fern. Economic Impacts of Revised MACT Standards for Hospital/Medical/Infectious Waste Incinerators: Final Report. Prepared for Tom Walton. U.S. Environmental Protection Agency. Office of Air Quality Planning and Standards (MD-C439-02). Research Triangle Park, NC. July 2009, page 2-19.

### 2.5.2 Regional Markets for HMIWI Services

The total estimated waste throughput represented by commercial HMIWI units was over 104,000 pounds, which represents almost 70% of all medical waste incinerated. Captive incinerator units typically only incinerate waste that is produced by the captive hospital at which the unit is located. Treatment of the other 70% of waste generated by hospitals and other generating facilities that do not have captive HMIWI is distributed among the 14 commercial HMIWI units in the United States, located at 10 facilities, owned by five parent companies.

The geographic distribution of the 14 commercial units creates market power for facilities providing commercial treatment of medical wastes. The 10 commercial HMIWI facilities are spread across nine states. The locations of the HMIWI units become an issue when hospitals take into account transportation costs associated with transferring “red bag” waste to commercial incinerator units. More often than not, hospitals will prefer to patronize nearby incinerator units that result in lower transportation costs. Consequently, these commercial facilities have market power in regions that do not have strong incineration alternatives; only North Carolina has more than one commercial HMIWI facility. Figure 2-4 illustrates the distribution of commercial incinerator units.”



**Figure 2-4. Regional Distribution of Commercial HMIWI**

Source: Holloway, T. July 6, 2009. Revised Compliance Costs and Economic Inputs for Existing HMIWI.

## Stericycle Hearing Officer's Recommendations for Minimizing Waste Sent to Incineration

From: Memorandum. To :Sheila C. Holman, Director, Division of Air Quality. From: Ronald E. Slack, Regional Supervisor, DAQ, Mooresville Regional Office. Subject: Hearing Officer's Report and recommendations, Renewal of Air Permit Number 05896T18. Stericycle, Inc. Haw River, Alamance County, North Carolina, Facility ID 04/01/00010, July 26, 2010, page 3.

### B. Additional Non-Permit Recommendations for North Carolina

Changes in 40 CFR 60 Subpart Ce and Subpart Ec are expected to result in the closure of several HMIWI throughout the country. The Division of Solid Waste rules allow for alternate methods of treatment of pathological waste that some waste generators are reluctant to use. Consequently, in the interest of reducing unnecessary incinerated waste, I recommend that the Division of Environmental Assistance and Outreach along with the Division of Solid Waste, and the Division of Air Quality, host a meeting with, or request to speak at a scheduled meeting of the North Carolina Hospital Association and/or other waste generators to discuss implications of the October 6, 2009 revisions to 40 CFR 60 Subpart Ce and Subpart Ec and to discuss how to minimize waste sent to incineration. Waste treatment facilities such as Stericycle should be invited to attend and to offer their assistance to those waste generators. The waste management plan requirements in 60.55c of the October 6, 2009 revisions to 40 CFR 60 Subpart Ec, effective not later than October 6, 2014, may require a culture shift to implement.

## Medical Waste Incineration Reduction Questions/Comments by the Blue Ridge Environmental Defense League

1. Incineration may be preferred over landfill as a general priority for waste disposal, but since prevention (better purchasing/waste reduction at the source), reuse, and recycling are preferred over incineration, are these priorities valued similarly among and within the different divisions within DENR? The question comes up when looking at the Title V permits for medical waste incinerators. There are a number of items permitted for incineration that can be recycled (e.g., paper, some plastics). It seems inconsistent that the DAQ issues permits that allow burning paper documents when shredding/recycling is preferred over incineration by the state's solid waste policy.

What changes that emphasize more sustainable waste disposal methods can be made to ensure a more consistent approach across Divisions?

*For reference:*

### § 130A309.04. State solid waste management policy and goals.

(a) It is the policy of the State to promote methods of solid waste management that are alternatives to disposal in landfills and to assist units of local government with solid waste management. In furtherance of this State policy, there is established a hierarchy of methods of managing solid waste, in descending order of preference:

- (1) Waste reduction at the source;
- (2) Recycling and reuse;
- (3) Composting;
- (4) Incineration with energy recovery;
- (5) Incineration without energy recovery;
- (6) Disposal in landfills.

2. How can the state re-emphasize these priorities of reduction, reuse, recycling with health care institutions, given that incineration is occurring more than is necessary?

3. How can we promote better waste management practices on the part of hospitals which generate the vast majority of the waste, so that less waste is generated and less goes to incineration?

The DWM has made efforts to encourage better waste management practices on the part of health care institutions. Where you have been successful, what do you think made the effort work? What do you see as the main stumbling blocks to hospitals engaging in improved waste management practices? What would it take to address these?

4. If hospitals send waste to incineration out of an "overabundance of caution," what would it take to reduce their level of caution to a more reasonable level?

5. In the Title V permitting process for medical waste incinerators, is there coordination/input into the development of the permit conditions between different divisions within DENR? For example, in Stericycle's latest Title V permit questions arose regarding the definition of "non-hazardous trace chemotherapeutic waste." Was the Hazardous Waste Section as well as the biological waste section included in the considerations to ensure that the chemotherapeutic waste that is incinerated is, indeed, non-hazardous? It would appear from the written discussion of this issue posted by the DAQ that only Stericycle was consulted (but we emphasize that this was the appearance from the written discussion of the draft permit). The final definition used in the permit had a fairly restrictive list of chemical agents and left out many other current cytotoxic/chemical agents that are as toxic as or more toxic than some of the agents now not permitted for incineration. Since hazardous waste is not permitted in medical waste incinerators, we remain concerned that many cytotoxic/chemical agents which should be excluded are not being properly diverted.

6. Does NCDENR provide an easily accessible, clear set of guidance for health care facilities on the web regarding waste reduction/prevention, recycling, reuse and as well as what can be sent to incineration and/or alternative disposal methods? If these guidelines exist, are they consistent/agreed upon across different NCDENR divisions?
7. Can NCDENR (DWM, Pollution Prevention) work with national groups such as Practice GreenHealth and Healthcare Without Harm in an effort to promote incineration minimization?
4. What consideration is given to the toxicity of incinerator fly ash and bottom ash when incineration is said to be preferred over landfilling.
5. As air pollution control devices improve, can we assume that the toxicity of ash going to landfills increases?
6. Are all of the substances that are regulated for emissions also regulated in the ash that goes to landfill? If not, which are/are not?
7. Does any part of the waste stream that is considered non-regulated medical waste require incineration?
8. What part of regulated medical waste must be incinerated because there are no regulatory alternatives to incineration?
9. Commercial autoclaves in our state currently do not have shredders. Does this add unnecessary bulk to our landfills? How much does the lack of shredders in these autoclaves drive health care facilities to incinerate more items than necessary? (Given that they cannot risk exposure of patient information which a shredder would destroy.)
10. Can the State of NC promote non-incineration alternatives that are safe and responsible? If so, how?
11. Can an “incineration fee” be attached to boxes labeled “incinerate only” for incineration? Proceeds could go to NC Health Care funds or programs to promote medical waste reduction in North Carolina. This fee would encourage waste reduction at the source as well as promote reuse and recycling.
12. What agency sets the regulations for hospitals regarding incineration of trace (non-hazardous) chemotherapy? What is the rationale for this? Has there been any revisiting of the requirement to incinerate?
13. Are states that do not require incineration of any part of the regulated medical waste stream sending waste to North Carolina for incineration?
14. Can North Carolina legislators/regulators create a category of “Non-incineration Waste” that must by definition be treated by non-incineration methods? Could such a regulation apply to both in-state and out-of-state waste?
15. Which alternative methods for treating pathological waste approved by the DWM are operating and available to waste generators in North Carolina and surrounding states?
16. How do the costs of incineration compare to other methods of treatment?
17. Questions about minimizing the incineration of plastics and encouraging recycling of those plastics that can be recycled:
  - a.) How are plastics handled in the overall waste flow now?
  - b.) What plastic items are incinerated now? How is this determined?
  - c.) What are the criteria for including plastic in the incineration-bound containers?
  - d.) How can criteria for including plastics in incinerator-bound waste be adjusted to minimize incineration of plastic?

## APPENDIX H

### § 130A309.04. State solid waste management policy and goals.

(a) It is the policy of the State to promote methods of solid waste management that are alternatives to disposal in landfills and to assist units of local government with solid waste management. In furtherance of this State policy, there is established a hierarchy of methods of managing solid waste, in descending order of preference:

- (1) Waste reduction at the source;
- (2) Recycling and reuse;
- (3) Composting;
- (4) Incineration with energy recovery;
- (5) Incineration without energy recovery;
- (6) Disposal in landfills.

(b) It is the policy of the State to encourage research into innovative solid waste management methods and products and to encourage regional solid waste management projects.

(c) It is the goal of this State to reduce the municipal solid waste stream, primarily through source reduction, reuse, recycling, and composting, by forty percent (40%) on a per capita basis by 30 June 2001.

- (1), (2) Repealed by Session Laws 1995 (Regular Session, 1996), c. 594, s. 8.

(c1) To measure progress toward the municipal solid waste reduction goal in a given year, comparison shall be made between the amount by weight of the municipal solid waste that, during the baseline year and the given year, is received at municipal solid waste management facilities and is:

- (1) Disposed of in a landfill;
- (2) Incinerated;
- (3) Converted to tire-derived fuel; or
- (4) Converted to refuse-derived fuel.

(c2) Comparison shall be between baseline and given years beginning on 1 July and ending on 30 June of the following year. The baseline year shall be the year beginning 1 July 1991 and ending 30 June 1992. However, a unit of local government may use an earlier baseline year if it demonstrates to the satisfaction of the Department that it has sufficient data to support the use of the earlier baseline year.

- (c3) Repealed by Session Laws 1995 (Regular Session, 1996), c. 594, s. 8.

(d) In furtherance of the State's solid waste management policy, each State agency shall develop a solid waste management plan that is consistent with the solid waste management policy of the State.

(d1) It is the policy of the State to obtain, to the extent practicable, economic benefits from the recovery from solid waste and reuse of material and energy resources. In furtherance of this policy, it is the goal of the State to foster partnerships between the public and private sectors that strengthen the supply of, and demand for, recyclable and reusable materials and that foster opportunities for economic development from the recovery and reuse of materials.

(e), (f) Repealed by Session Laws 1995 (Regular Session, 1996), c. 594, s. 8. (1989, c. 784, s. 2; 1991, c. 621, s. 2; 1991 (Reg. Sess., 1992), c. 1013, s. 6; 1995 (Reg. Sess., 1996), c. 594, s. 8.)

### § 130A309.26. Regulation of medical waste.

(a) As used in this section:

- (1) "Sharps" means needles, syringes, and scalpel blades.
- (2) "Treatment" means any process, including steam sterilization, chemical treatment, incineration, and other methods approved by the Commission which changes the character or composition of medical waste so as to render it noninfectious.

(b) It is the intent of the General Assembly to protect the public health by establishing standards for the safe packaging, storage, treatment, and disposal of medical waste. The Commission shall adopt and the Department shall enforce rules for the packaging, storage, treatment, and disposal of:

- (1) Medical waste at facilities where medical waste is generated;
- (2) Medical waste from the point at which the waste is transported from the facility where it was generated;
- (3) Onsite and offsite treatment of medical waste; and
- (4) The offsite transport, storage, treatment or disposal of medical waste.

(c) No later than 1 August 1990, the Commission shall adopt rules necessary to protect the health, safety, and welfare of the public and to carry out the purpose of this section. Such rules shall address, but need not be limited to, the packaging of medical waste, including specific requirements for the safe packaging of sharps and the segregation, storage, treatment, and disposal of medical wastes at the facilities in which such waste is generated. (1989, c. 784, s. 2; 1995 (Reg. Sess., 1996), c. 594, s. 20.)

### **15A NCAC 13B .1203 GENERAL REQUIREMENTS FOR REGULATED MEDICAL WASTE**

(a) Regulated medical waste shall be treated prior to disposal. Acceptable methods of treatment are as follows:

(1) blood and body fluids in individual containers in volumes greater than 20 ml - Incineration or sanitary sewage systems, provided the sewage treatment authority is notified;

(2) microbiological waste - Incineration, steam sterilization, microwave treatment, or chemical treatment;

(3) pathological wastes - Incineration.

(b) Other methods of treatment shall require approval by the Division.

(c) Regulated medical waste treated in accordance with Paragraph (a) of this Rule may be managed in accordance with 15A NCAC 13B .0100 - .0700.

(d) Crematoriums are not subject to the requirements of Rule .1207(3) of this Section.

(e) A person who treats Regulated medical waste at the generating facility or within an integrated medical facility is not subject to the storage and record keeping requirements of Rule .1207(1) of this Section.

(f) Generating facilities and integrated medical facilities in operation on October 1, 1990 that incinerate Regulated medical waste are not subject to the requirements of Rule .1207(3)(a-1) of this Section until January 1, 1995.

*History Note: Authority G.S. 130A-309.26;*

*Eff. October 1, 1990;*

*Amended Eff. April 1, 1993.*

### **15A NCAC 13B .1204 REQUIREMENTS FOR GENERATORS OF REGULATED MEDICAL WASTE**

(a) A person who ships regulated medical waste from the generating facility for off-site treatment shall meet the following requirements:

(1) Regulated medical waste shall be packaged in a minimum of one plastic bag placed in a rigid fiberboard

box, rigid drum, or other rigid container constructed in a manner that prevents leakage of the contents. The plastic bag shall be impervious to moisture and have a strength sufficient to preclude ripping, tearing or bursting the waste-filled bag under normal conditions of usage and handling. Each bag shall be constructed of material of sufficient single thickness strength to pass the 165-gram dropped dart impact resistance test as prescribed by Standard D 1709-91 of the American Society for Testing and Materials, which is incorporated by reference including subsequent amendments and editions, and certified by the bag manufacturer. A copy is available for inspection at the Department of Environment, Health, and Natural Resources, Division of Solid Waste Management, 401 Oberlin Road, Raleigh, North Carolina. Copies may be requested by mail at American Society for Testing and Materials, 1916 Race Street, Philadelphia, P.A. 19103 or by calling (215) 299-5400 for a cost of twelve dollars (\$12.00) plus one dollar and fifty cents (\$1.50) for shipping and handling unless prepaid, then the fee is twelve dollars (\$12.00).

(2) Regulated medical waste shall be stored in a manner that maintains the integrity of the packaging at all times.

(3) Each package of regulated medical waste shall be labeled with a water-resistant universal biohazard symbol.

(4) Each package of regulated medical waste shall be marked on the outer surface with the following information:

(A) the generator's name, address, and telephone number;

(B) the transporter's name, address, and telephone number;

(C) storage facility name, address, and telephone number, when applicable;

(D) treatment facility name, address and telephone number;

(E) date of shipment; and

(F) "INFECTIOUS WASTE" or "MEDICAL WASTE".

(b) Records of regulated medical waste shall be maintained for each shipment and shall include the information listed in this Paragraph. This information shall be maintained at the generating facility for no less than three years.

(1) amount of waste by number of packages (piece count);

(2) date shipped off-site;

(3) name of transporter;

(4) name of storage or treatment facility.

The requirements of this Paragraph shall not apply to persons who generate less than 50 pounds of regulated medical waste per month.

(c) A plan to ensure proper management of regulated medical waste shall be prepared and maintained at the generating facility.

*History Note: Authority G.S. 130A-309.26;*

*Eff. October 1, 1990;*

*Amended Eff. October 1, 1992; December 1, 1991; March 1, 1991.*

## FOOTNOTES

---

<sup>1</sup>NCDENR. Division of Waste Management. Incinerator Facility Annual Reports, Stericycle and BMWMC, July 1, 2009 - June 30, 2010. See Figure 1 and Appendix B.

<sup>2</sup>Heller, Katherine, Nourani, Vesall, & Braun, Fern. Economic Impacts of Revised MACT Standards for Hospital/Medical/Infectious Waste Incinerators: Final Report. Prepared for Tom Walton. U.S. Environmental Protection Agency. Office of Air Quality Planning and Standards (MD-C439-02). Research Triangle Park, NC. July 2009, pages 2-1, 2-2. It is noted that since the publication of this report, at least one incinerator has already shutdown (Loyola University Health System), reducing the number to 56.

<sup>3</sup>Op. cit., page 2-14.

<sup>4</sup>Op. cit., page 2-19.

<sup>5</sup>NCDENR. Division of Waste Management. Incinerator Facility Annual Reports, Stericycle and BMWMC, July 1, 2006-June 30, 2010. See Appendix A.

<sup>6</sup>Op. cit. See 2009-2010 data in Appendix A.

<sup>7</sup>Op. cit. See Appendix A & D.

<sup>8</sup>HealthCare Without Harm ([http://www.noharm.org/us\\_canada/issues/waste/](http://www.noharm.org/us_canada/issues/waste/)) and Practice GreenHealth (<http://www.practicegreenhealth.org/>)

<sup>9</sup>Krisiunas, E. President, WNWN International. 2008. Personal communication with Vesall Nourani, RTI international. Cited in Heller, Katherine & Nourani, Vessall. Economic Impacts of Revised MACT Standards for Hospital/Medical/Infectious Waste Incinerators: Final Report. Prepared for Tom Walton. U.S. Environmental Protection Agency. Office of Air Quality Planning and Standards (MD-C439-02). Research Triangle Park, NC. October 2008.

<sup>10</sup>Hoboy, Selin (Stericycle). 2009. E-mail Communication to the EPA Docket Center (EPA/DC). Docket ID Number EPA-HQ-OAR-2006-0534. <<http://www.regulations.gov>>. As obtained on July 3, 2009. Cited in Heller, K., Nourani, V., & Braun, F., op cit., page 2-18.

<sup>11</sup><http://www.chwmeg.org/asp/search/detail.asp?ID=193> as indexed on 12-5-2010.

<sup>12</sup>Heller, K., Nourani, V., & Braun, F. Op.cit., page 2-19. See also Appendix E for a national chart of regional incinerator markets.

<sup>13</sup>See footnotes #10 and 11.

---

<sup>14</sup>Pyrek, Kelly M. Hospitals Boost Sustainability Efforts, Reduce Environmental Impact. Infection Control Today. (<http://www.infectioncontrolday.com/articles/2010/11/hospitals-boost-sustainability-efforts-reduce-environmental-impact.aspx> obtained on 12-4-2010).

<sup>15</sup>Federal Register. Part III. Environmental Protection Agency. 40 CFR Part 60 Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Hospital/Medical/Infectious Waste Incinerators; Proposed Rule. December 1, 2008, page 72989.

<sup>16</sup>Pyrek, K.M. Op. cit.

<sup>17</sup>Green Guide for Health Care™ See (<http://www.gghc.org/>)

<sup>18</sup>Heller, Katherine & Nourani, Vessall. Economic Impacts of Revised MACT Standards for Hospital/Medical/Infectious Waste Incinerators: Final Report. Prepared for Tom Walton. U.S. Environmental Protection Agency. Office of Air Quality Planning and Standards (MD-C439-02). Research Triangle Park, NC. October 2008, page 2-16.

<sup>19</sup>Memorandum. To :Sheila C. Holman, Director, Division of Air Quality. From: Ronald E. Slack, Regional Supervisor, DAQ, Mooresville Regional Office. Subject: Hearing Officer's Report and recommendations, Renewal of Air Permit Number 05896T18. Stericycle, Inc. Haw River, Alamance County, North Carolina, Facility ID 04/01/00010, July 26, 2010, page 3. See Appendix F for excerpt.

<sup>20</sup>Environmental Management Commission. State of North Carolina. Department of Environmental and Natural Resources. Division of Air Quality. Report of Proceedings of Public Hearing on Proposed Amendments to 15A NCAC 02D .1206, HOSPITAL, MEDICAL, AND INFECTIOUS WASTE INCINERATORS. September 7, 2010. Greensboro, NC 27412.

<sup>21</sup>See Appendix C.

<sup>22</sup>§ 130A309.04. State solid waste management policy and goals. See Appendix H.

<sup>23</sup>NCDENR. Division of Waste Management. Incinerator Facility Annual Reports, Stericycle and BMWMC, July 1, 2009 - June 30, 2010. See Appendix D.

<sup>24</sup>§ 130A309.04. State solid waste management policy and goals. See Appendix H.