RTI INTERNATIONAL | Memorandum

Date: October 24, 2008

Subject: Summary of Industry Responses to HMIWI Waste Segregation Information Collection Request
EPA Contract No. EP-D-06-118; Work Assignment No. 1-07; SPPD No. 02/30
RTI Project No. 0210426.001.007

From: Thomas Holloway

To: Mary Johnson
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I. Background

On September 15, 1997, the U.S. Environmental Protection Agency (EPA) adopted new source performance standards (NSPS) and emission guidelines for hospital/medical/infectious waste incinerators (HMIWI). The NSPS and emission guidelines were established under sections 111 and 129 of the Clean Air Act (CAA). The HMIWI regulations limit emissions of nine air pollutants (particulate matter, carbon monoxide, dioxins/furans, sulfur dioxide, nitrogen oxides, hydrogen chloride, lead, mercury, and cadmium) from HMIWI and also include provisions for compliance and performance testing, monitoring, reporting and recordkeeping, siting of new HMIWI, operator training and qualification, and a waste management plan.

On November 14, 1997, the Sierra Club and the Natural Resources Defense Council filed suit in the U.S. Court of Appeals for the District of Columbia Circuit challenging EPA's methodology for adopting the HMIWI regulations. On March 2, 1999, the Court issued its opinion, remanding the rule to EPA to further explain its reasoning in determining the maximum achievable control technology (MACT) floors for new and existing HMIWI. The Court did not vacate the regulations, so the NSPS and emission guidelines remained in effect during the remand and were fully implemented by September 2002.

On February 6, 2007, EPA proposed its responses to the questions raised in the Court's remand and solicited public comments on the proposal. As a result of recent Court decisions (e.g., Brick and Structural Clay Products MACT standard), as well as issues raised in public comments on the HMIWI proposal, EPA determined that a re-proposal of responses to the questions raised in the Court's remand was necessary. To assist in this effort, on November 5, 2007, EPA sent out an information collection request (ICR) to nine industry contacts, under the authority of section 114 of the CAA, to gather information on the waste segregation practices that the industry currently employs to reduce the amount of hospital/medical/infectious waste that is incinerated. The industry contacts that were chosen include:

- Washington County Hospital—Hagerstown, MD
- Sacred Heart Health System—Pensacola, FL (the facility recently shut down its HMIWI)
- Merck & Co., Inc.—Whitehouse Station, NJ
- Bayfront Health System—St. Petersburg, FL
- Mercy Health Services—Baltimore, MD (the facility recently shut down its HMIWI)
- East Carolina University—Greenville, NC
- Kona Community Hospital—Kealakekua, HI
- St. Jude Children's Research Hospital—Memphis, TN
- Stericycle, Inc.—Bannockburn, IL

These specific industry contacts were chosen:

- To include HMIWI facilities with varying levels of mercury emissions, which may suggest differences in mercury waste segregation programs (e.g., batteries, fluorescent light bulbs)
- To obtain a sampling of different types of facilities (hospitals, pharmaceutical operations, universities, and commercial operations), incinerator sizes (large, medium, and small HMIWI), incinerator ages (existing vs. new HMIWI), and emission controls (dry injection fabric filters, wet scrubbers, combustion controls, and others) for HMIWI

Attachment 1 to this memorandum presents the ICR that was sent to each of the industry contacts.

II. Summary of Responses

Responses to the ICR were received from all nine industry contacts (comprising 15 facilities) and are discussed below and presented in more detail in Table 1.[1-9] Note that the label for each column in Table 1 includes the corresponding survey question number. The facility ID number from the HMIWI project database (at the time of the survey) was also included in Table 1 to facilitate any future links with the database.[10] Although two of the facilities had recently shut down their HMIWI, they provided information about the waste segregation practices that were employed while the HMIWI was operating. Their responses will be discussed on that basis.

A. Waste Segregation Practices

Except for Stericycle, all of the other industry contacts (nine facilities) practice onsite waste segregation to reduce the volume of waste being incinerated, and five of the nine facilities also accept offsite waste and require the offsite waste generators to employ waste segregation practices. Stericycle (six facilities) only accepts waste from offsite waste generators and does not generate waste onsite. Stericycle encourages waste segregation from its waste generator clients through a number of efforts, including a waste management plan, contract requirements and waste acceptance protocols, a dental waste management program, and educational programs and supporting posters. None of the facilities responding to the ICR employ waste segregation practices onsite after receiving waste from offsite.

Based on ICR responses, waste segregation began at different times at the facilities, with most starting the practice in the 1980s and 1990s. Two facilities began waste segregation fairly recently (2003 and 2006). One facility contact did not know when waste segregation began there, and another stated that waste segregation was implemented over time. A third facility contact provided no response to the question. Stericycle initiated its waste segregation program in 1989, when the company was founded, and the program has expanded since then.

All nine of the facilities that practice onsite waste segregation separate batteries and fluorescent bulbs (i.e., mercury waste) from the hospital/medical/infectious (HMI) waste stream. Eight of the nine facilities separate paper and/or cardboard, four separate glass, and three separate plastics from the HMI waste stream. With one exception, none of the hospitals separate glass or plastics. (Hospitals comprise six of the nine facilities that practice onsite waste segregation.) Other materials that are separated from the HMI waste stream include hazardous waste, waste oil, wood, construction debris, refrigerants, and various metals and metals-containing materials (e.g., aluminum, copper, lead, mercury, steel, and electronics). Disposal methods for the segregated materials from these nine facilities include landfilling, recycling, hazardous waste program, autoclaving, incineration by third party, and use in fuel blending.

B. Costs/Effects of Waste Segregation

Contacts for seven of the nine facilities that practice onsite waste segregation provided estimates of current annual costs for segregation and disposal of the aforementioned materials. The estimated annual costs for the seven facilities range from approximately $9,700 to $675,000 per year. Cost components were provided for the $20,000 and $675,000 cost estimates. The $20,000 cost estimate includes materials, staff time, and contractor costs, and the $675,000 cost estimate includes labor to conduct pickup, segregation, and storage, as well as transportation and disposal. When the annual cost estimates are correlated with annual waste throughput for the facilities, the cost estimates range from approximately $7/ton to $554/ton. Annual waste throughput values for all but one facility were obtained from the HMIWI project database based on 2002-2003 data obtained from HMIWI facilities and EPA Regions.[10] The contact for the remaining facility provided an annual waste throughput value in the ICR response.

None of the facility contacts responding to the ICR had emissions test data showing the effects of waste segregation. One facility contact stated that they could not estimate the effects because the date when waste segregation began at their facility was not known. Another facility contact stated that all compliance testing was conducted under State regulations, and there were no stack test or relative accuracy test audit (RATA) requirements for waste segregation.

C. Feasibility of Future Waste Segregation Requirements

Contacts for all nine of the facilities that practice onsite waste segregation indicated that, if they were required to implement waste segregation practices, disposal of the segregated waste material would be feasible for them. However, one facility contact estimated that such a requirement would cost $150,000 for them to implement, compared to the $20,000 they estimated they spend currently. Another facility contact estimated an initial cost of $500,000, and a

monthly cost of $12,500, compared to the $200,000 to $300,000 they spend currently. Another facility contact said that total costs of such a requirement were still being determined. Three other facility contacts estimated no additional cost, indicating that further waste segregation would not be necessary for them because they were already segregating the materials; however, one of these contacts stated that they would incur costs for recordkeeping, reporting, and other administration if waste segregation were regulated. Another facility contact stated that they could not segregate further than they are already doing due to the requirements of their permit.

Regarding other impacts, one facility contact stated that further segregation would be challenging based on space requirements (in a hospital) and costly. A second facility contact mentioned confidential document destruction as another impact from disposal of their waste. Another facility contact pointed out that Select Agent registration with the U.S. Department of Agriculture requires incineration of material contaminated with biological agents on site. According to the facility contact, cradle-to-grave responsibility of infectious materials would now include a new liability of transportation to a third-party site. The facility contact also stated that the loss of their incinerator would hamper the disposal of recognizable body parts and animal carcasses generated in clinical and research areas. According to the facility contact, these limitations seemed unjustified in light of their limited use of the incinerator, which puts them consistently well below HMIWI emission limits.

III. Conclusions

The ICR provided a useful window into the current status of waste segregation practices in the HMIWI industry. Based on ICR responses, it appears that the industry is already practicing waste segregation to a significant extent, except for glass and plastics at hospitals. The facilities surveyed indicated that a requirement to employ waste segregation could be feasible to implement, but the estimated cost to implement varied widely. Based on the responses received, any new waste segregation requirement would need to account for what is already being done and recognize the limitations of what can be done due to certain permit conditions and other requirements.

IV. References

1. Letter and attachment from Earl G. Greenia, Kona Community Hospital, to Mary Johnson, EPA. November 15, 2007. "Waste Segregation Practices Questionnaire-Hospital/Medical/Infectious Waste Incinerators."

2. Letter from William A. Christie, Bayfront Medical Center, to Mary Johnson, EPA. November 26, 2007. "Re: Requirement to provide information according to Title 42 of the United States Code, Chapter 85, Subchapter I, Part A, section 7414."

3. Letter from Sue Ann Wise, Merck and Company, Inc., to Mary Johnson, EPA. December 14, 2007. "Re: Requirement to provide information according to Title 42 of the United States Code, Chapter 85, Subchapter I, Part A, section 7414 (42 U.S.C. § 7414)."

4. Letter from Jim Gaut, St. Jude Children's Research Hospital, to Mary Johnson, EPA. December 18, 2007. "Waste Segregation Practices Questionnaire-Hospital/Medical/Infectious Waste Incinerators."

5. Letter from Selin Hoboy, Stericycle, Inc., to Mary Johnson, EPA. December 20, 2007. "Re: Requirement to provide information according to Title 42 of the United States Code, Chapter 85, Subchapter I, Part A, Section 7414 (42 U.S.C. §7414)."

6. E-mail from Mike Rowe, East Carolina University, to Mary Johnson, EPA. December 20, 2007. "Waste Segregation Practices Questionnaire-Hospital/Medical/Infectious Waste Incinerators."

7. Letter from Sacred Heart Hospital to Mary Johnson, EPA. January 10, 2008. "Waste Segregation Practices Questionnaire-Hospital/Medical/Infectious Waste Incinerators."

8. Letter from Mark Mills, Washington County Hospital, to Mary Johnson, EPA. January 16, 2008. "Waste Segregation Practices Questionnaire-Hospital/Medical/Infectious Waste Incinerators."

9. Letter from Rachel DeMunda, Mercy Medical Center, to Mary Johnson, EPA. January 17, 2008. "Waste Segregation Practices Questionnaire-Hospital/Medical/Infectious Waste Incinerators."

10. Memorandum from Thomas Holloway, RTI, to project file. February 6, 2007. *Hospital/Medical/Infectious Waste Incinerator (HMIWI) Inventory and Emissions Database*.

Attachment 1

Enclosure 1

WASTE SEGREGATION PRACTICES QUESTIONNAIRE
HOSPITAL/MEDICAL/INFECTIOUS WASTE INCINERATORS

1. Respondent's name, address, and phone number

_____

_____

_____

_____

2. Are facilities that you own or represent currently using incinerators to dispose of hospital, medical, and/or infectious waste?

_____

3. If incinerators are being used, provide the following information <u>for each incinerator</u>:

a. Location of incinerator

Facility Name: _____

Street Address: _____

City, State, and Zip Code: _____

b. (1) If the facility burns waste generated onsite: Does the facility currently employ waste segregation practices that reduce the volume of waste being incinerated?

_____

(2) If the facility burns waste generated offsite (e.g., at other facilities): Are the offsite waste generators required to employ waste segregation practices that reduce the volume of waste being incinerated?

_____

If no, does the facility that burns the offsite-generated unsegregated waste employ waste segregation practices after receiving the waste?

_____

c. When were waste segregation practices begun? _____

d. What types of materials are segregated from the waste stream?

paper/cardboard _____ glass _____

plastics _____ batteries _____

fluorescent light bulbs _____

other metal containing materials (please list) _____

other chlorine containing materials (please list) _____

other (please list) _____

e. How are the segregated materials disposed of (e.g., local trash collection, landfilling)?

_____

_____

f. Estimate of your current cost to segregate and dispose of materials identified above (please indicate whether cost estimate is on an annual basis, monthly basis, or other)

_____

_____

g. Do you have any emissions test data that would show the effects of segregating materials from the waste stream (e.g., test data before and after waste segregation practices were employed)? _____

If yes, please attach complete copies of the test reports and any analyses of the impact of waste segregation on emissions.

4. If you were to be required to implement waste segregation practices:

a. Would disposal of the segregated waste material through local trash collection; by landfilling; or by sending it to another incinerator (e.g., municipal waste combustor) be feasible? _____

_____

b. How much would it cost to segregate the material and use local trash collection, landfill it, or send it to another incinerator, instead of burning that portion of your waste?

_____

_____

c. Would there be other impacts on disposal of your waste? (If so, please describe them.)

_____

_____

_____

Table 1. Summary of Industry Responses to HMIWI Waste Segregation Practices Questionnaire

FACID	Date of response	Resp. name (1)	Resp. title (1)	Resp. facility (1)	Resp. address (1)	Resp. city (1)	Resp. state (1)	Resp. zip (1)	Resp. phone no. (1)	Use HMIWI (2)	Notes (2)
115	11/15/2007	Earl G. Greenia, FACHE	Regional Chief Operating Officer	Kona Community Hospital	79-1019 Haukapila Street	Kealakekua	HI	96750	(808) 322-4430	Yes	
54	11/26/2007	William A. Christie	Director of Plant Operations, Safety, Security, and Environmental Services	Bayfront Medical Center	701 6th Street S.	St. Petersburg	FL	33701	(727) 823-1234	Yes	
36	12/14/2007	Sue Ann Wise, P.E.	Global Safety & the Environment	Merck & Co., Inc.	Two Merck Drive, P.O. Box 200	Whitehouse Station	NJ	08889	(908) 423-3181	Yes	The West Point facility operates two Residual and Municipal incinerators that are subject to the HMIWI regulations; these incinerators are permitted by the PA DEP to burn certain regulated Residual and Municipal wastes not categorized as medical or infectious wastes.
5	12/14/2007	Sue Ann Wise, P.E.	Global Safety & the Environment	Merck & Co., Inc.	Two Merck Drive, P.O. Box 200	Whitehouse Station	NJ	08889	(908) 423-3181	Yes	Rahway facility
63	12/18/2007	Jim Gaut, Ph.D.	Director, Environmental Health and Safety	St. Jude Children's Research Hospital	332 N. Lauderdale - Mailstop #730	Memphis	TN	38105	(910) 495-5191	Yes	Under title V permit #00465-01TV
42	12/20/2007	Selin Hoboy	Corp. VP ESH	Stericycle, Inc.	286161 N. Keith Drive	Lake Forest	IL	60045	(847) 367-5910	Yes	Stericycle owns and operates six HMIWI.
65	12/20/2007	Selin Hoboy	Corp. VP ESH	Stericycle, Inc.	286161 N. Keith Drive	Lake Forest	IL	60045	(847) 367-5910	Yes	Stericycle owns and operates six HMIWI.
59	12/20/2007	Selin Hoboy	Corp. VP ESH	Stericycle, Inc.	286161 N. Keith Drive	Lake Forest	IL	60045	(847) 367-5910	Yes	Stericycle owns and operates six HMIWI.
106	12/20/2007	Selin Hoboy	Corp. VP ESH	Stericycle, Inc.	286161 N. Keith Drive	Lake Forest	IL	60045	(847) 367-5910	Yes	Stericycle owns and operates six HMIWI.

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110	12/20/2007	Selin Hoboy	Corp. VP ESH	Stericycle, Inc.	286161 N. Keith Drive	Lake Forest	IL	60045	(847) 367-5910	Yes	Stericycle owns and operates six HMIWI.
94	12/20/2007	Selin Hoboy	Corp. VP ESH	Stericycle, Inc.	286161 N. Keith Drive	Lake Forest	IL	60045	(847) 367-5910	Yes	Stericycle owns and operates six HMIWI.
125	12/20/2007	Mike Rowe	Assistant Director, Facilities Services	East Carolina University, Health Sciences Campus - HSC Utility Plant	600 Moye Boulevard	Greenville	NC	27834	(252) 744-3448	Yes	
53	1/10/2008	Not provided	Not provided	Sacred Heart Hospital	5151 N. 9th Avenue	Pensacola	FL	32513	(880) 416-7000	No	HMIWI closed 8/2/07.
21	1/16/2008	Mark Mills	Manager, Facilities Engineering	Washington County Hospital	251 E. Antietam Street	Hagerstown	MD	21740	(301) 790-8000	Yes	General number for facility.
14	1/17/2008	Rachel DeMunda		Mercy Medical Center	301 St. Paul Place	Baltimore	MD	21202	(410) 951-7916	No	HMIWI closed Feb 2007.

Note: The label for each table column includes the number of the question that is being addressed.

Table 1.

FACID	Facility name (3.a)	Facility address (3.a)	Facility city (3.a)	Facility state (3.a)	Facility zip (3.a)	Onsite waste segreg. (3.b.1)	Notes (3.b.1)
115	Kona Community Hospital	79-1019 Haukapila Street	Kealakekua	HI	96750	Yes	
54	Bayfront Medical Center	750 5th Avenue S.	St. Petersburg	FL	33701	Yes	
36	Merck & Co., Inc.	770 Sumneytown Pike	West Point	PA	19486	Yes	The facility segregates as many materials as practical for diversion from the Residual and Municipal incinerators; separate collection containers and pickups are conducted to accommodate this activity; the West Point site accepts some offsite waste from Merck-owned or operated facilities and community service organizations (i.e., police dept, postal service, etc.), which is allowed under the permit; both offsite and onsite waste is generally packaged in an effort to reduce the volume of the waste; however, due to the nature of the material being burned, some plastics, paper, and glass are included for incineration as well.
5	Merck & Co., Inc.	126 E. Lincoln Avenue	Rahway	NJ	07065	Yes	
63	St. Jude Children's Research Hospital	332 N. Lauderdale	Memphis	TN	38105	Yes	
42	Stericycle, Inc.	254 W. Keene Road	Apopka	FL	32703	N/A	As a commercial HMIWI, Stericycle does not generate HMI waste.
65	Stericycle, Inc.	RR4. Box 243L	Clinton	IL	61727	N/A	As a commercial HMIWI, Stericycle does not generate HMI waste.
59	Stericycle, Inc.	1168 Porter Avenue	Haw River	NC	27258	N/A	As a commercial HMIWI, Stericycle does not generate HMI waste.
106	Stericycle, Inc.	3150 N. 7th Street	Kansas City	KS	66115	N/A	As a commercial HMIWI, Stericycle does not generate HMI waste.

Table 1.

FACID	Facility name (3.a)	Facility address (3.a)	Facility city (3.a)	Facility state (3.a)	Facility zip (3.a)	Onsite waste segreg. (3.b.1)	Notes (3.b.1)
110	Stericycle, Inc.	90 N. 1100 W.	North Salt Lake	UT	84054	N/A	As a commercial HMIWI, Stericycle does not generate HMI waste.
94	Stericycle, Inc.	1901 Pine Avenue S.E.	Warren	OH	44483	N/A	As a commercial HMIWI, Stericycle does not generate HMI waste.
125	East Carolina University, Health Sciences Campus	600 Moye Boulevard	Greenville	NC	27834	Yes	ECU does employ waste segregation practices; these practices originally began for separation of recyclable material from materials to be disposed of in a landfill; these practices are still in place, and the material that is sent for incineration is "Red Bag" HMI waste and sensitive documents (paper).
53	Sacred Heart Hospital	5151 N. 9th Avenue	Pensacola	FL	32513	Yes	Prior to shutdown
21	Washington County Hospital	251 E. Antietam Street	Hagerstown	MD	21740	Yes	
14	Mercy Medical Center	301 St. Paul Place	Baltimore	MD	21202	Yes	Prior to incinerator closure

Note:

Table 1.

FACID	Offsite waste segreg. (3.b.2)	Notes (3.b.2)	Onsite segreg. of offsite waste (3.b.3)	When segreg. begun (3.c)	Notes (3.c)
115	Yes		N/A		Unknown
54	Yes		N/A	1990s	Approximately 10 years ago
36	Yes	The facility accepts only waste allowed by the permit; offsite waste is segregated by the offsite generator to reduce volume as much as possible.	N/A	1980s	Waste segregation practices have been in place onsite since the 1980s, prior to the HMIWI regulations
5	No	The facility does not accept waste that is generated offsite.	N/A	1994	
63	N/A		N/A	2003	
42	Yes	Stericycle strives for waste segregation through a number of educational programs and efforts that are required of the waste generator, including but not limited to waste management plan, contract requirements and waste acceptance protocols (including customer acceptance and signature), dental waste management program, and educational programs and supporting posters.	N/A	1989	Waste segregation practices began in 1989 when Stericycle was founded, were expanded in the late 1990s during implementation of the NSPS, and continue today with ongoing waste segregation awareness training.
65	Yes	Stericycle strives for waste segregation through a number of educational programs and efforts that are required of the waste generator, including but not limited to waste management plan, contract requirements and waste acceptance protocols (including customer acceptance and signature), dental waste management program, and educational programs and supporting posters.	N/A	1989	Waste segregation practices began in 1989 when Stericycle was founded, were expanded in the late 1990s during implementation of the NSPS, and continue today with ongoing waste segregation awareness training.
59	Yes	Stericycle strives for waste segregation through a number of educational programs and efforts that are required of the waste generator, including but not limited to waste management plan, contract requirements and waste acceptance protocols (including customer acceptance and signature), dental waste management program, and educational programs and supporting posters.	N/A	1989	Waste segregation practices began in 1989 when Stericycle was founded, were expanded in the late 1990s during implementation of the NSPS, and continue today with ongoing waste segregation awareness training.
106	Yes	Stericycle strives for waste segregation through a number of educational programs and efforts that are required of the waste generator, including but not limited to waste management plan, contract requirements and waste acceptance protocols (including customer acceptance and signature), dental waste management program, and educational programs and supporting posters.	N/A	1989	Waste segregation practices began in 1989 when Stericycle was founded, were expanded in the late 1990s during implementation of the NSPS, and continue today with ongoing waste segregation awareness training.

Table 1.

FACID	Offsite waste segreg. (3.b.2)	Notes (3.b.2)	Onsite segreg. of offsite waste (3.b.3)	When segreg. begun (3.c)	Notes (3.c)
110	Yes	Stericycle strives for waste segregation through a number of educational programs and efforts that are required of the waste generator, including but not limited to waste management plan, contract requirements and waste acceptance protocols (including customer acceptance and signature), dental waste management program, and educational programs and supporting posters.	N/A	1989	Waste segregation practices began in 1989 when Stericycle was founded, were expanded in the late 1990s during implementation of the NSPS, and continue today with ongoing waste segregation awareness training.
94	Yes	Stericycle strives for waste segregation through a number of educational programs and efforts that are required of the waste generator, including but not limited to waste management plan, contract requirements and waste acceptance protocols (including customer acceptance and signature), dental waste management program, and educational programs and supporting posters.	N/A	1989	Waste segregation practices began in 1989 when Stericycle was founded, were expanded in the late 1990s during implementation of the NSPS, and continue today with ongoing waste segregation awareness training.
125	Yes	ECU does accept HMI waste from Pitt County Memorial Hospital (PCMH); this hospital is part of the University Health Systems and is used as a teaching facility for ECU School of Medicine; PCMH does employ waste segregation practices.	N/A	1980s	Estimate; not sure
53	N/A		N/A		Implemented over time
21	Yes		N/A		Not provided
14	N/A		N/A	Jul-2006	

Note:

Table 1.

FACID	Segreg. materials (3.d)								Notes (3.d)	Disposal method (3.e)
	Paper/ card-board	Plastics	Glass	Batteries	Fluor. bulbs	Other metal-containing materials	Other chlorine-containing materials	Other		
115	X			X	X	Needles				Local trash collection
54	X			X	X			Hazardous pharmaceuticals		Cardboard compacted; batteries and bulbs disposed by hazardous waste hauler
36	X	X	X	X	X	Aluminum and other types of metals including steel; electronics		Wood, construction debris	Several waste streams are separated out from being incinerated onsite in the Residual and Municipal incinerators; these currently include aluminum and other types of metals including steel, unused/uncontaminated glass, wood, electronics, plastics, and construction debris; alkaline batteries are not segregated from the waste stream.	Aluminum/other metals, paper, cardboard, batteries, glass, wood, some plastics, fluorescent bulbs, and electronics are wholly or partially recycled; construction debris is landfilled.
5	X	X	X	X	X	Mercury				Recycling
63			X	X	X			Biohazardous research waste		Depending on the item, it is either recycled, autoclaved, incinerated by third party, used in fuel blending, or sent to landfill.
42									Stericycle does not segregate materials from the regulated waste stream received from generators; Stericycle's waste segregation program is required of the generator of the HMI waste; Stericycle prohibits the opening of contaminated sharps containers and regulated red bag waste to prevent percutaneous injuries in accordance with 29 CFR 1910.1030 Bloodborne pathogens, specifically §1910.1030(d).	N/A; Stericycle is not involved with generator waste segregation disposal methods.
65									Stericycle does not segregate materials from the regulated waste stream received from generators; Stericycle's waste segregation program is required of the generator of the HMI waste; Stericycle prohibits the opening of contaminated sharps containers and regulated red bag waste to prevent percutaneous injuries in accordance with 29 CFR 1910.1030 Bloodborne pathogens, specifically §1910.1030(d).	N/A; Stericycle is not involved with generator waste segregation disposal methods.
59									Stericycle does not segregate materials from the regulated waste stream received from generators; Stericycle's waste segregation program is required of the generator of the HMI waste; Stericycle prohibits the opening of contaminated sharps containers and regulated red bag waste to prevent percutaneous injuries in accordance with 29 CFR 1910.1030 Bloodborne pathogens, specifically §1910.1030(d).	N/A; Stericycle is not involved with generator waste segregation disposal methods.
106									Stericycle does not segregate materials from the regulated waste stream received from generators; Stericycle's waste segregation program is required of the generator of the HMI waste; Stericycle prohibits the opening of contaminated sharps containers and regulated red bag waste to prevent percutaneous injuries in accordance with 29 CFR 1910.1030 Bloodborne pathogens, specifically §1910.1030(d).	N/A; Stericycle is not involved with generator waste segregation disposal methods.

Table 1.

FACID	Segreg. materials (3.d)								Notes (3.d)	Disposal method (3.e)
	Paper/ card-board	Plastics	Glass	Batteries	Fluor. bulbs	Other metal-containing materials	Other chlorine-containing materials	Other		
110									Stericycle does not segregate materials from the regulated waste stream received from generators; Stericycle's waste segregation program is required of the generator of the HMI waste; Stericycle prohibits the opening of contaminated sharps containers and regulated red bag waste to prevent percutaneous injuries in accordance with 29 CFR 1910.1030 Bloodborne pathogens, specifically §1910.1030(d).	N/A; Stericycle is not involved with generator waste segregation disposal methods.
94									Stericycle does not segregate materials from the regulated waste stream received from generators; Stericycle's waste segregation program is required of the generator of the HMI waste; Stericycle prohibits the opening of contaminated sharps containers and regulated red bag waste to prevent percutaneous injuries in accordance with 29 CFR 1910.1030 Bloodborne pathogens, specifically §1910.1030(d).	N/A; Stericycle is not involved with generator waste segregation disposal methods.
125	X	X	X	X	X	Hg-containing devices		Waste oil, hazardous waste (including anti-neoplastics)	ECU segregates sensitive documents fron non-sensitive, with the sensitive documents sent for incineration and the non-sensitive documents disposed; ECU has a recycling program for (1) plastics and glass, (2) Hg-containing devices (however, medical devices that are defined as HMI waste are disposed of via incineration), and (3) waste oil (contracted services); ECU has a hazardous waste program to dispose of materials defined per EPA as hazardous waste; this waste stream and disposal includes anti-neoplastics (contracted services).	Landfilling, recycling, hazardous waste program (contracted services).
53	X			X	X			Hazardous waste	Facility segregated cardboard, but not paper.	All are recycled, except hazardous waste, which is transported and recycled/treated by a licensed contractor.
21	X			X	X	Copper, steel, aluminum	Refrigerants		Refrigerants are recycled.	Landfilling, except for refrigerants, which are recycled.
14	X			X	X	Mercury, lead			Recycled.	Recycled

Note:

Table 1.

FACID	Current segreg./disp. cost (3.f)	Notes (3.f)	Annual waste throughput, tpy	Cost per ton of segreg./ disp.	Emis test data (3.g)	Notes (3.g)	Feasibility of disp. reqt (4.a)	Notes (4.a)
115		Unable to estimate	12		No	Unable to estimate since date of segregation not known	Yes	
54	$35,000	Minimum cost; annual estimate	1,796	$19	No		Yes	Outsource vendor
36	$675,000	Includes the costs for labor to conduct pickup, segregation, and storage, as well as transportation and disposal; approximate annual estimate.	3,393	$199	No	All compliance testing is conducted per the PA DEP regulations, and there are no stack test or RATA requirements for waste segregation.	Yes/No	Waste segregation is currently being done in accordance with municipal requirements, which require recycling of aluminum, cardboard, and office paper to the extent practical; it would not be feasible to remove infectious waste from outer cardboard or plastic containers in an effort to recycle the container due to contamination and employee safety concerns.
5	$46,000	Approximate annual estimate	572	$80	No		Yes	Merck is currently segregating these materials, and, therefore, it is feasible.
63	$20,000	Includes materials, staff time, contractor costs; approximate annual estimate	78	$258	No		Yes	
42	N/A	Waste segregation costs are the responsibility of the generator.			N/A		N/A	Stericycle is not involved with generator waste segregation disposal methods.
65	N/A	Waste segregation costs are the responsibility of the generator.			N/A		N/A	Stericycle is not involved with generator waste segregation disposal methods.
59	N/A	Waste segregation costs are the responsibility of the generator.			N/A		N/A	Stericycle is not involved with generator waste segregation disposal methods.
106	N/A	Waste segregation costs are the responsibility of the generator.			N/A		N/A	Stericycle is not involved with generator waste segregation disposal methods.

Table 1.

FACID	Current segreg./disp. cost (3.f)	Notes (3.f)	Annual waste throughput, tpy	Cost per ton of segreg./ disp.	Emis test data (3.g)	Notes (3.g)	Feasibility of disp. reqt (4.a)	Notes (4.a)
110	N/A	Waste segregation costs are the responsibility of the generator.			N/A		N/A	Stericycle is not involved with generator waste segregation disposal methods.
94	N/A	Waste segregation costs are the responsibility of the generator.			N/A		N/A	Stericycle is not involved with generator waste segregation disposal methods.
125		Will need to provide estimate at future date	98		No		Yes	ECU has a contingency plan with another incineration company to handle HMI waste should a situation arise that ECU was unable to incinerate its own; all other segregated material is either appropriately landfilled or recycled.
53	$9,684	Reflects annual cost for batteries and fluorescent bulbs; no cost to recycle cardboard, receive approximately $20/ton; hazardous material disposal cost not available.	1,350	$7.2	No		Yes	HMIWI is shut down.
21	$200,000-$300,000	Annual estimate; will use midpoint to determine cost per ton.	451	$554	No		Yes	
14	$30,000	Annual estimate (600,000 lbs waste); will use this throughput to determine cost per ton.	300	$100	No		Yes	

Note:

Table 1.

FACID	Reqd segreg./ disp. cost (4.b)	Notes (4.b)	Other impacts (4.c)	Notes (4.c)
115		Unable to estimate		
54	N/A	Not allowed by permit	Yes	Segregation would be challenging by space requirements (in a hospital) and costly
36	N/A	Further segregation is not necessary since the facilities serve as Residual and Municipal incinerators.	No	Further segregation is not necessary since the facilities serve as Residual and Municipal incinerators.
5	$46,000	Merck is currently segregating these materials, and the costs are noted in question 3.f; please note that if segregation of waste were regulated, additional costs would be incurred for recordkeeping, reporting, and other administration.	No	
63	$150,000	Approximate annual estimate	Yes	Select Agent registration with the USDA requires incineration of material contaminated with biological agent on site; cradle-to-grave responsibility of infectious materials would now include new liability of transportation to third-party site; loss of incinerator would hamper disposal of recognizable body parts and animal carcasses generated in clinical and research areas; limitations seem unjustified in light of limited use that puts us consistently well below emission thresholds.
42	N/A	Waste segregation costs are the responsibility of the generator.	N/A	
65	N/A	Waste segregation costs are the responsibility of the generator.	N/A	
59	N/A	Waste segregation costs are the responsibility of the generator.	N/A	
106	N/A	Waste segregation costs are the responsibility of the generator.	N/A	

Table 1.

FACID	Reqd segreg./ disp. cost (4.b)	Notes (4.b)	Other impacts (4.c)	Notes (4.c)
110	N/A	Waste segregation costs are the responsibility of the generator.	N/A	
94	N/A	Waste segregation costs are the responsibility of the generator.	N/A	
125	N/A		N/A	
53		Total costs still being determined.	Yes	Confidential document destruction
21	$500,000 initial cost, $12,500 monthly		No	
14	$30,000	See previous cost (3.f).	No	

Note: