

Date: October 24, 2008

Subject: Compliance Costs and Economic Inputs for Existing HMIWI
EPA Contract No. EP-D-06-118; Work Assignment No. 2-03; SPPD No. 02/30
RTI Project No. 0210426.002.003

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I. Background

The U.S. Environmental Protection Agency (EPA), under sections 111 and 129 of the Clean Air Act (CAA), is required to regulate emissions of nine pollutants from hospital/medical/infectious waste incinerators (HMIWI): hydrogen chloride (HCl), carbon monoxide (CO), lead (Pb), cadmium (Cd), mercury (Hg), particulate matter (PM), dioxins/furans (CDD/CDF), nitrogen oxides (NO_x), and sulfur dioxide (SO₂). To respond to concerns raised by the U.S. Court of Appeals for the D.C. Circuit regarding the methodology originally used to develop the regulation, EPA is re-developing the HMIWI standards. The EPA has developed a series of maximum achievable control technology (MACT) floor and beyond-the-floor (BTF) options to support that re-development. These options are discussed further in separate memoranda.^{1,2} The purpose of this memorandum is to present for existing sources the model costs, nationwide costs, and nationwide cost effectiveness associated with these compliance options and with alternatives to compliance. The memorandum also provides employment and sales information for those companies that employ HMIWI, to serve as inputs (along with costs) in conducting an economic impacts analysis of the re-developed HMIWI regulation.

II. Model Costs

This section presents the costs estimated for a series of model existing HMIWI for (1) the emission controls used to comply with the MACT floor and BTF compliance options; (2) the monitoring, testing, recordkeeping, and reporting activities used to demonstrate compliance; and (3) the alternatives to compliance. The model existing HMIWI include large, medium, small non-rural, and small rural units. Table 1 shows the basis for the development of the parameters for the model HMIWI (e.g., incinerator charge rate, stack gas flow rate, incinerator operating hours, and concentrations) were developed. Table 2 presents a summary of the model costs for each emission control and alternative to compliance.

A. Emission Controls

Emission control technologies and other control measures that can be used to comply with the MACT floor and BTF options for existing HMIWI include packed-bed wet scrubbers, fabric filters, dry scrubbers, HMIWI secondary chamber retrofits, selective noncatalytic reduction (SNCR), activated carbon injection (ACI), and various other control measures designed to obtain incremental emission reductions. This section presents the model costs that were estimated for these control measures.

The retrofit factors for the model capital costs were assumed to be 40 percent for wet scrubbers, fabric filters, and dry scrubbers and 20 percent for SNCR and ACI.^{3,4} Downtime costs for the retrofits were assumed to be negligible (except for secondary chamber retrofits, which already include retrofit/downtime costs). Most HMIWI are expected to be outdoors with adequate space to install an emission control system without shutting down the incinerator. It was also expected that connecting the ductwork could be performed during a scheduled downtime for maintenance.⁵

The model annual costs for the emission controls were estimated in units of dollars per year (\$/yr) and \$/flow. The \$/flow costs were calculated by dividing the \$/yr control cost estimate for each model HMIWI by the gas flow rate for that model. The \$/flow costs were used to calculate unit-specific control costs for each HMIWI, as discussed in section III of this memorandum.

1. Packed-bed wet scrubbers. Packed-bed wet scrubbers are especially effective at reducing emissions of acid gases such as HCl, and also provide limited control of PM, metals, and SO₂ (if present at high enough concentrations). These wet scrubbers can be installed either alone or after a dry scrubber/ fabric filter. Wet scrubber costs are presented for each model HMIWI in Table 3 and were estimated based on algorithms in the *Model Plant Description and Control Cost Report* for HMIWI and a memo update.^{5,6} The wet scrubber capital costs from these algorithms were updated to 2007 dollars using the Chemical Engineering Plant Cost Index (CEPCI) and range from approximately \$260,000 to \$453,000.

The wet scrubber annual costs were updated to 2007 dollars using current estimates for unit costs and labor rates and range from approximately \$51,600/yr to \$104,000/yr. The updated unit costs for electricity and caustic were obtained from online sources.^{7,8} Unit costs for water and sewage disposal were obtained from the latest version of EPA's Air Compliance Advisor.⁹ Current operating labor rates were estimated based on occupational employment statistics available online from the U.S. Bureau of Labor Statistics for several industries that use HMIWI, specifically the May 2007 mean hourly wage estimates for Stationary Engineers and Boiler Operators in the following sectors: General Medical and Surgical Hospitals; Waste Treatment and Disposal; Pharmaceutical and Medicine Manufacturing; and Colleges, Universities, and Professional Schools.¹⁰ To determine an average operating labor rate for all HMIWI, a weighted average was taken of the aforementioned mean hourly wage estimates using the fraction of HMIWI located in each of those sectors.

2. Fabric filters. Fabric filters can be used to improve the PM (and associated particulate metals) emission control at HMIWI. Fabric filters can be installed either alone or before a wet scrubber. Fabric filter costs are presented for each model HMIWI in Table 4 and were estimated based on algorithms in the *Model Plant Description and Control Cost Report* for HMIWI.⁵ The fabric filter capital costs from these algorithms were updated to 2007 dollars using the CEPCI and range from approximately \$689,000 to \$1.02 million.

The fabric filter annual costs were updated to 2007 dollars using current estimates for unit costs and labor rates and range from approximately \$130,000/yr to \$268,000/yr. Updated unit costs for electricity, compressed air, and dust disposal were obtained from online sources.^{7,11,12} A unit cost for water was obtained from the latest version of EPA's Air Compliance Advisor.⁹ Current operating labor rates were estimated based on the aforementioned occupational employment statistics available online from the U.S. Bureau of Labor Statistics.¹⁰

3. Dry scrubbers. A dry scrubber can be used in concert with a fabric filter to reduce emissions of PM, as well as emissions of acid gases such as HCl. The predominant type of dry system used at HMIWI is a dry sorbent injection system followed by a fabric filter (DIFF). DIFF costs are presented for each model HMIWI in Table 5 and were estimated based on algorithms in the *Model Plant Description and Control Cost Report* for HMIWI and a memo update.^{5,13} The DIFF capital costs from these algorithms were updated to 2007 dollars using the CEPCI and range from approximately \$917,000 to \$1.36 million.

The DIFF annual costs were updated to 2007 dollars using current estimates for unit costs and labor rates and range from approximately \$168,000/yr to \$347,000/yr. Updated unit costs for electricity, lime, compressed air, and dust disposal were obtained from online sources.^{7,11,12,14} A unit cost for water was obtained from the latest version of EPA's Air Compliance Advisor.⁹ Current operating labor rates were estimated based on the aforementioned occupational employment statistics available online from the U.S. Bureau of Labor Statistics.¹⁰

4. Secondary chamber retrofits. Secondary chamber retrofits, which include retrofitting the incinerator with a larger secondary chamber (with a longer gas residence time, e.g., 2 seconds) and operating it at a higher temperature (e.g., 1800°F), can achieve greater reductions in emissions of combustion-related pollutants such as CO and CDD/CDF. Secondary chamber retrofit costs are presented for each model HMIWI in Table 6 and were estimated based on algorithms in the *Model Plant Description and Control Cost Report* for HMIWI and a memo update.^{5,15} Estimates of waste charging hours and downtime days were also taken from the *Model Plant Description and Control Cost Report* for HMIWI.⁵ The secondary chamber retrofit capital costs estimated based on the algorithms were updated to 2007 dollars using the CEPCI and range from approximately \$75,300 to \$346,000.

The secondary chamber retrofit annual costs were estimated in 2007 dollars using an updated unit cost for natural gas obtained from an online source, and range from approximately \$15,100/yr to \$80,800/yr.¹⁶

5. Selective noncatalytic reduction. SNCR systems have been used for NO_x emission control on industrial boilers, electric utility steam generators, thermal incinerators, and municipal

solid waste energy recovery facilities.³ NO_x reductions of 45 percent or higher are estimated for HMIWI using SNCR systems.¹⁷ The costs for an SNCR system are presented for each model HMIWI in Table 7 and were estimated based on algorithms in the *OAQPS Control Cost Manual*.³ The SNCR capital costs from these algorithms were updated to 2007 dollars using the CEPCI and range from approximately \$186,000 to \$586,000.

The SNCR annual costs were updated to 2007 dollars using current estimates for unit costs and labor rates and range from approximately \$22,900/yr to \$67,900/yr. The unit cost for a 50 percent urea solution (\$0.85/gallon [gal]) was taken from the *OAQPS Control Cost Manual*.³ Two other unit costs for urea were found online, but one cost (up to \$0.46/gal) was based on delivery of dry urea (with the urea solution later mixed onsite), while the other cost (\$0.60/gal) was over 5 years old.^{18,19} To be conservative, the higher unit cost from the *OAQPS Control Cost Manual* was used. An updated unit cost for electricity was obtained from an online source.⁷ A unit cost for water was obtained from the latest version of EPA's Air Compliance Advisor.⁹ The average heating value of 8,500 British thermal units per pound (Btu/lb) of medical waste, used in the annual electricity cost equation, was obtained from the *Process Description Report* for HMIWI.²⁰

The annual electricity cost for SNCR systems is also dependent on the NO_x concentration at the SNCR inlet, which was estimated to be 0.28 lb/million Btu (MM Btu), based on the average of the NO_x concentration data for currently operating HMIWI. The NO_x concentration for each HMIWI was estimated (as shown in the following equation) using baseline emissions estimates developed in a separate memorandum:²¹

$$\text{NO}_x \text{ concentration (lb/MM Btu)} = \text{NO}_x \text{ baseline emissions (lb/yr)} / [\text{operating hours per year (hr/yr)} \times \text{incinerator charge rate (lb waste/hr)} \times \text{heating value (8,500 Btu/lb waste)}] \times 10^6 \text{ Btu/MM Btu}$$

6. Activated carbon injection system. Injecting activated carbon before the fabric filter has been demonstrated to improve the removal efficiency of both Hg and CDD/CDF from HMIWI. Activated carbon injection costs are presented for each model HMIWI in Table 8 and were estimated based on algorithms in the *Model Plant Description and Control Cost Report* for HMIWI.⁵ Capital costs for the ACI system from these algorithms were updated to 2007 dollars using the CEPCI and range from approximately \$3,800 to \$12,000.

Annual costs for the ACI system were updated to 2007 dollars using current estimates for unit costs and labor rates and range from approximately \$5,400/yr to \$56,300/yr. Updated unit costs for activated carbon and dust disposal were obtained from online sources.^{12,22-24} Current operating labor rates were estimated based on the occupational employment statistics available online from the U.S. Bureau of Labor Statistics.¹⁰

The factor of 0.00127 in the annual cost equation for dust disposal is based on an ACI rate capable of producing a carbon concentration of 338 milligrams per dry standard cubic meter (mg/dscm), which is expected to achieve reductions of 90 percent for Hg and 98 percent for CDD/CDF relative to inlet levels.⁵

7. Incremental controls. In some instances, it may not be necessary to install a new control system to achieve the emissions reductions necessary to comply with the control options.

An incremental reduction in emissions may be achievable by simply increasing the flow of lime, sodium bicarbonate (NaHCO_3), or activated carbon prior to the fabric filter; increasing the amount of natural gas used in the incinerator; or increasing the amount of caustic used in the wet scrubber. Table 9 presents model costs for each of these incremental control measures, and the following sections discuss how the model costs were estimated for these controls.

a. Increase caustic. One strategy to reduce acid gas emissions such as SO_2 further is to increase the amount of caustic used in the wet scrubber to react with and neutralize the acid gases in the gas stream. The addition of caustic is assumed to sufficiently reduce emissions without requiring any changes to the wet scrubber. Model costs to increase the amount of caustic were estimated using the same caustic equation employed in costing packed-bed wet scrubbers and range from approximately \$5/yr to \$200/yr.^{5,6}

b. Increase lime/sodium bicarbonate flow. Emissions of acid gases such as HCl may be reduced further by increasing the feed rate of lime or NaHCO_3 prior to the fabric filter. Model costs to increase lime flow were estimated using the same equations for makeup lime and dust disposal employed for the DIFF costs and range from approximately \$200/yr to \$20,900/yr.^{5,13} Model costs to increase NaHCO_3 flow were estimated using similar equations, with a slight difference based on the stoichiometry and molecular weight for NaHCO_3 , and range from approximately \$800/yr to \$81,600/yr.^{5,13}

c. Increase activated carbon flow. As noted previously, injecting activated carbon before the fabric filter has been demonstrated to improve the removal efficiency of both Hg and CDD/CDF from HMIWI. Model costs to increase activated carbon flow were estimated using the same equations for activated carbon and dust disposal employed for installing an ACI system and range from approximately \$1,600/yr to \$42,600/yr.⁵

d. Increase natural gas use. One strategy to reduce CO and CDD/CDF emissions further is to increase the amount of natural gas fired in the secondary chamber and consequently increase the temperature in the secondary chamber. Carbon monoxide is a product of incomplete combustion, and increasing the temperature in the secondary chamber should subsequently increase the degree of combustion in the chamber; higher temperatures in the secondary chamber should also contribute to the decomposition of CDD/CDF compounds.²⁵ Combustion can be improved in other ways (e.g., tuning up burners or improving mixing in the secondary chamber), but for purposes of this memorandum, analyses were conservatively based on increased natural gas use. Model costs to fire additional natural gas were estimated using the same natural gas equation employed in costing secondary chamber retrofits and range from \$1,100/yr to \$30,200/yr.^{5,15}

e. Improve fabric filter performance. One strategy to reduce PM and metals emissions further is to improve the performance of the fabric filter by replacing the filter bags used to capture the particulate emitted from the HMIWI. Model costs to improve fabric filter performance were estimated using the same equations for bag and cage replacement employed in costing fabric filters and DIFF and range from \$1,300/yr to \$8,600/yr.⁵

f. Increase NO_x reagent. One strategy to reduce NO_x emissions further is to increase the amount of ammonia or urea used in SNCR systems. Model costs to increase the amount of NO_x reagent were estimated using the same reagent cost equation employed in costing SNCR systems and range from \$500/yr to \$1,800/yr.³

B. Monitoring

1. Inspections. Under the 1997 HMIWI regulation, existing small rural HMIWI were required to conduct annual equipment inspections to compensate for the lack of annual emissions testing at those sources. The inspections would include the incinerator, control device (if any), and monitoring equipment. For the re-developed regulation, EPA has determined that annual control device inspections should be expanded to the other HMIWI to demonstrate that the control devices are operating sufficiently well to allow compliance with the tighter emission limits under the re-developed regulation.

Information on equipment inspections was gathered for the 1997 regulation.²⁶ Four companies (one incinerator dealer, one maintenance contractor, and two incinerator manufacturers) were contacted for information on the types of activities normally conducted during a equipment inspection, including control device inspections; the companies provided inspection cost estimates ranging from \$350 to \$800.²⁶ These costs were averaged and updated to 2007 dollars using the CEPCI to develop the inspection cost (\$900). (See Table 10.) This inspection cost was estimated for all model HMIWI regardless of size.

2. Parameter monitors. Monitoring of operating parameters can be used to indicate whether air pollution control equipment and practices are functioning properly to minimize air pollution. The 1997 HMIWI regulation included parameter monitoring requirements for good combustion, wet scrubbers, and dry scrubbers with fabric filters. For the re-developed regulation, EPA is keeping these parameter monitoring requirements and adding an additional parameter requirement for those HMIWI that are expected to install SNCR systems in order to comply with the more stringent NO_x limits. The model costs associated with these parameter monitoring requirements are presented in Table 11.

The 1997 regulation required all HMIWI to monitor charge rate and secondary chamber temperature to demonstrate good combustion practices. Because HMIWI are already monitoring these parameters, the monitoring costs presented in this memorandum only include the costs to monitor additional (e.g., wet scrubber, DIFF, ACI, and SNCR) parameters, plus any ancillary equipment costs (e.g., computer, data logger/computer interface, logging and reporting software, and printer) and other costs. (Some of the other costs include planning, selecting the type of equipment, providing support facilities, installing and checking the equipment, conducting performance specification tests, preparing a quality assurance/quality control [QA/QC plan], and recordkeeping and reporting.)

The 1997 regulation required HMIWI equipped with wet scrubbers, DIFF, and ACI to monitor the following parameters:

- Wet scrubbers: flue gas temperature, pressure drop across the wet scrubber (or the horsepower or amperage to the wet scrubber), scrubber liquor flow rate, and scrubber liquor pH
- DIFF: fabric filter inlet temperature, and HCl sorbent (i.e., lime) flow rate
- ACI: Hg and CDD/CDF sorbent (i.e., activated carbon) flow rate

Consequently, the wet scrubber monitoring costs developed for the 1997 regulation included costs for (1) thermocouple wire, (2) signal wire, (3) pressure transducer, (4) liquid flow transducers, and (5) controller element and transmitter for pH meter; the DIFF monitoring costs included costs for (1) thermocouple wire and (2) labor to monitor and record lime flow; and the ACI monitoring costs included labor costs to monitor and record activated carbon flow.²⁷ The wet scrubber, DIFF, and ACI monitoring costs estimated for the 1997 regulation were updated to 2007 dollars using the CEPCI and latest labor rates and rounded to the nearest \$100. Monitoring costs range from \$5,500/yr to \$9,000/yr for DIFF and \$1,300/yr to \$4,800/yr for ACI systems. Fabric filter monitoring costs are similar to those for DIFF, but do not include operating labor and overhead costs for recording lime flow. Fabric filter monitoring costs were estimated to be \$4,200/yr for all four model HMIWI. Wet scrubber monitoring costs are also identical for all four models, and were estimated at \$5,200/yr.

Under the re-developed HMIWI regulation, those HMIWI equipped with SNCR systems will be required to monitor ammonia or urea injection rate. SNCR monitoring costs estimated by EPA in August 2008 include costs to purchase and install an ammonia injection rate sensor with data acquisition system and data reduction.²⁸ These SNCR monitoring costs were adapted to the cost format in Table 11 and rounded to the nearest \$100. The SNCR monitoring costs for all four model HMIWI were estimated to be \$3,100/yr.

3. Bag leak detector. Although the re-developed HMIWI regulation is not requiring existing HMIWI equipped with fabric filters to install bag leak detectors, use of bag leak detectors is presented as an option for fabric filter-controlled HMIWI. Since the 1997 regulation, bag leak detectors have been shown to be an effective method for demonstrating continuous compliance for sources equipped with fabric filters. Bag leak detector costs estimated by EPA in July 2006 were updated to 2007 dollars using the CEPCI, and rounded to the nearest \$100.²⁹ The total cost for this monitor was estimated to be \$8,400/yr. (See Table 11.)

There are no parameter monitoring requirements for which bag leak detectors can be substituted. However, in the re-developed regulation, EPA would allow sources to use bag leak detectors to replace annual opacity testing, which would reduce the bag leak detector cost.

4. Continuous emissions monitoring systems (CEMS). The most direct means of monitoring compliance is the use of CEMS to measure the emissions of a pollutant on a continuous basis. The following text describes the voluntary CEMS options for existing HMIWI that will be included in the re-developed regulation. The costs for the various CEMS are presented in Table 11.

Although the re-developed regulation is not requiring CO, HCl, PM, Hg, or multi-metal CEMS for existing HMIWI, such systems are presented as an option for all sources. The costs for

these CEMS, estimated by EPA in 2006, were updated to 2007 dollars using the CEPCI and rounded to the nearest \$100.^{29,30} The total costs for these CEMS were estimated to be \$26,300/yr for CO CEMS; \$42,400/yr for HCl CEMS; \$51,200/yr for PM CEMS; \$102,900/yr for Hg CEMS; and \$57,800/yr for multi-metal CEMS. (See Table 11.)

In the re-developed regulation, EPA would allow sources to use these CEMS to replace the following annual tests and parameter monitoring to reduce the cost of the CEMS:

- CO CEMS: replace annual CO testing and monitoring of secondary chamber temperature
- HCl CEMS: replace annual HCl testing and monitoring of HCl sorbent (e.g., lime) flow rate for dry scrubbers and scrubber liquor pH for wet scrubbers
- PM CEMS: replace annual PM and opacity testing and monitoring of pressure drop (or horsepower or amperage) for wet scrubbers
- Multi-metals/Hg CEMS: replace flue gas temperature (there are no annual metals/Hg tests to replace)

5. Sorbent trap biweekly monitoring. Although EPA is not requiring sorbent trap biweekly monitoring of CDD/CDF or Hg emissions for existing HMIWI, such a system is presented as an option for all sources. The costs for this monitoring system, estimated by EPA in July 2006, were updated to 2007 dollars using the CEPCI and rounded to the nearest \$100.²⁹ The total cost for a sorbent trap biweekly monitoring system was estimated to be \$37,900/yr. (See Table 11.)

a. CDD/CDF sorbent trap monitoring. In the re-developed regulation, EPA would allow sources to use sorbent trap biweekly monitoring of CDD/CDF to replace monitoring of fabric filter inlet temperature to reduce the cost of the monitor. None of the other parameter monitoring requirements associated with CDD/CDF emissions, which include monitoring of CDD/CDF sorbent (i.e., activated carbon) flow rate, waste charge rate, and secondary chamber temperature, can afford to be replaced. (In addition to CDD/CDF, activated carbon flow rate also serves to demonstrate compliance with the Hg emission limit, and monitoring of charge rate and secondary chamber temperature also serves to demonstrate compliance with the PM and CO emission limits.) Furthermore, there is no annual CDD/CDF stack test that could be replaced with sorbent trap biweekly monitoring.

If sorbent trap biweekly monitoring of CDD/CDF was combined with a multi-metals or Hg CEMS, or Hg sorbent trap monitoring, additional parameter monitors could be eliminated. For HMIWI equipped with a dry scrubber or a dry/wet scrubber system, such a combination could be used to replace monitoring of fabric filter inlet temperature and monitoring of Hg and CDD/CDF sorbent flow rate (i.e., activated carbon). For HMIWI equipped with a wet scrubber, such a combination could be used to replace monitoring of flue gas temperature.

b. Hg sorbent trap monitoring. In the re-developed regulation, EPA would allow sources to use sorbent trap biweekly monitoring of Hg to replace monitoring of wet scrubber outlet flue gas temperature to reduce the cost of the monitor. None of the other parameter monitoring requirements associated with Hg emissions, which include monitoring of Hg sorbent

(i.e., activated carbon) flow rate, waste charge rate, and secondary chamber temperature, can afford to be replaced. (In addition to Hg, activated carbon flow rate also serves to demonstrate compliance with the CDD/CDF emission limit, and monitoring of charge rate and secondary chamber temperature also serves to demonstrate compliance with the PM and CO emission limits.) Furthermore, there is no annual Hg stack test that could be replaced with sorbent trap biweekly monitoring.

If sorbent trap biweekly monitoring of Hg was combined with CDD/CDF sorbent trap monitoring, additional parameter monitors could be eliminated. For HMIWI equipped with a dry scrubber or a dry/wet scrubber system, such a combination could be used to replace monitoring of fabric filter inlet temperature and monitoring of Hg and CDD/CDF sorbent flow rate (i.e., activated carbon). For HMIWI equipped with a wet scrubber, such a combination could be used to replace monitoring of flue gas temperature.

C. Testing

1. Stack testing. Under the 1997 HMIWI regulation, all existing HMIWI except small rural units were required to:

- Demonstrate initial compliance with the emission limits for HCl, CO, Pb, Cd, Hg, PM, CDD/CDF, and opacity by conducting an initial stack test for those pollutants; and
- Demonstrate ongoing compliance with the emission limits for HCl, CO, PM, and opacity by conducting annual stack tests for those pollutants.

The re-developed regulation will keep these requirements and also require those HMIWI to demonstrate initial compliance with the revised limits for NO_x and SO₂ by conducting an initial stack test for those two pollutants (unless they have already been tested for and are in compliance with the revised limits). Also, those HMIWI whose previous stack tests do not demonstrate compliance with one or more of the revised emission limits in the re-developed regulation will be required to conduct another stack test for those pollutants.

Under the 1997 HMIWI regulation, existing small rural HMIWI were required to:

- Demonstrate initial compliance with the emission limits for CO, Hg, PM, CDD/CDF, and opacity by conducting an initial stack test for those pollutants; and
- Demonstrate ongoing compliance with the emission limit for opacity by conducting annual opacity stack tests.

The re-developed regulation will keep these requirements and also require the small rural HMIWI to demonstrate initial compliance with the revised HCl, Pb, Cd, NO_x, and SO₂ emission limits by conducting an initial stack test for those pollutants (unless they have already been tested for and are in compliance with the revised limits). For the first time, the small rural units will also be required to demonstrate ongoing compliance with the emission limits for HCl, CO, and PM by conducting annual stack tests for those pollutants. As with the other HMIWI, those small rural HMIWI whose previous stack tests do not demonstrate compliance with one or more of the

revised emission limits in the re-developed regulation will be required to conduct another stack test for those pollutants.

Stack test costs developed for each EPA test method for the 1997 regulation were updated to 2007 dollars using the CEPCI, adjusted as necessary to conform to the range of more recent, typical test costs, and rounded to the nearest \$1,000 (except for the less expensive opacity test, which was rounded to the nearest \$100).^{27,31,32} The updated and adjusted stack test costs are presented in Table 12 for all model HMIWI. Stack test costs were estimated at \$12,000 for EPA Method 5 (PM); \$2,500 for EPA Method 9 (opacity); \$26,000 for EPA Method 23 (CDD/CDF); \$14,000 for EPA Method 29 (metals); and \$7,000 each for EPA Methods 6C (SO₂), 7E (NO_x), 10 (CO), and 26 (HCl).

2. Visible emissions testing. Under the 1997 HMIWI regulation, new large HMIWI were subject to a 5 percent visible emissions (VE) limit for fugitive emissions generated during ash handling. To demonstrate compliance with this emission limit, new large HMIWI were required to conduct annual performance tests for fugitive emissions from ash handling using EPA Method 22. For the re-developed regulation, EPA has determined that this minimal testing requirement should be extended to the other HMIWI, but only as an initial test requirement to determine whether fugitive ash emissions are a concern from these sources. Because of its simple requirements, Method 22 VE testing is expected to be conducted in-house by operating personnel at the HMIWI facility. Certification training is not required for this test method.

A Method 22 VE test requires only one stopwatch to monitor the duration of the observation period, another stopwatch to observe the emissions, a light meter to monitor illuminance indoors (if necessary), and an anemometer to monitor wind speed and wind direction. Capital costs for the equipment were obtained online from two vendors: (1) Professional Equipment, which provided a wide range of models and costs for light meters and anemometers, and (2) Cole-Parmer, which provided a wide range of models and costs for stopwatches.^{33,34} The median costs for the equipment (\$200 for a combination light meter/anemometer, \$50 for two digital stopwatches) were used to develop the Method 22 capital cost (\$250).

The Method 22 annual costs (including labor, overhead, taxes, insurance, administration, capital recovery) were estimated using standard EPA cost procedures and the latest labor rates, assuming 1 hr/reading, and 3 readings/test. Rounded to the nearest \$100, the total annual test cost was estimated at \$200. (See Table 13.) This test cost was estimated for all model HMIWI regardless of size.

D. Recordkeeping and Reporting Costs

The additional recordkeeping and reporting burden needed to comply with the re-developed regulation includes the following:

- Reading instructions on the new requirements—1 person-hour
- Initial demonstrations of continuous monitoring systems (CMS) to develop new parameter limits (including reports of the results)—16 person-hours

- Notifications of initial performance tests—1 person-hour each for the VE and stack tests
- Notifications of CMS demonstrations—2 person-hours
- Reports of initial performance tests—8 person-hours for both VE and stack tests and 2 person-hours for just VE tests
- Annual report, including results of performance tests conducted during the year—40 person-hours

Some of these burden items only apply to certain HMIWI. There are two different burden estimates for the notification and report of the initial performance test—one that applies to HMIWI conducting both pollutant stack tests and fugitive ash tests and one that applies to HMIWI conducting just fugitive ash tests. Also, the burden associated with reporting the annual results of performance tests applies only to the small rural HMIWI that will, for the first time, be required to conduct annual stack tests for HCl, CO, and PM. The recordkeeping and reporting burden for control equipment inspections is already included with the monitoring.

The burden estimate for initial CMS demonstrations (16 person-hours) was determined by dividing the cost to certify CMS by the composite hourly labor rate. The cost to certify CMS was based on an estimate for the 1997 regulation.²⁷ That cost estimate was updated to 2007 dollars using the CEPCI. The composite hourly labor rate was determined (as shown in the following bullets) based on occupational employment statistics available online from the U.S. Bureau of Labor Statistics which were adjusted upwards by 60 percent to include overhead and profit.¹⁰

- Technical labor rate (natural resources, construction, and maintenance) = (total compensation of \$23.47/hr) x (overhead and profit rate of 1.6) = \$37.55/hr
- Management labor rate (management, professional, and related) = (total compensation of \$49.23/hr) x (overhead and profit rate of 1.6) = \$78.76/hr
- Clerical labor rate (sales and office) = (total compensation of \$13.19/hr) x (overhead and profit rate of 1.6) = \$21.10/hr
- Composite hourly labor rate = (technical labor rate) + (0.05 x management labor rate) + (0.1 x clerical labor rate) = \$43.60/hr

The management and clerical burden for each HMIWI were estimated at 5 and 10 percent of the technical burden, respectively. The recordkeeping and reporting costs were estimated by multiplying the technical, management, and clerical burden estimates by their respective labor rates. The results are presented in Table 14.

E. Alternatives to Compliance

In addition to the compliance options listed above, alternatives to compliance have also been developed, including autoclaving and landfilling the waste, hauling the waste to a municipal waste combustor (MWC), and contracting with a commercial medical waste disposal company. This section presents the model costs that were estimated for these alternatives.

1. Autoclave/landfill. The cost to comply with the re-developed HMIWI regulation may lead some facilities (e.g., hospitals) to switch to other waste treatment and disposal methods,

such as onsite autoclaving, followed by landfilling the waste. Costs for this option are presented for each model HMIWI in Table 15 and were estimated using cost estimates provided by an autoclave vendor and an online source.^{35,36}

Cost estimates from the vendor included capital costs for the sterilizer and compactor; operational costs for chamber liners, labor, capital expense, maintenance, steam, and electricity; and hauling costs; the vendor also provided costs for a biological indicators test (including test kit).³⁵ Inspection costs and permit fees were obtained from an online source.³⁶

The hauling costs from the vendor were revised to extract landfill costs. National average landfill tip fees from the 2005 Tip Fee Survey prepared by the National Solid Wastes Management Association (NSWMA) were then used to estimate model landfill costs.¹² The total annual autoclave/landfill costs in Table 15 are presented in \$/lb of waste and in \$/yr. Calculation of the costs in \$/yr assumes each model HMIWI operates at two-thirds of its capacity. The \$/yr costs range from \$9,100/yr to \$205,000/yr.

2. Hauling waste to municipal waste combustor. Rather than treat their waste onsite, some facilities may decide to haul the waste to the nearest MWC. Costs for this option are presented for each model HMIWI in Table 16 and were estimated using the national average incineration tip fee (\$61.64/ton) from NSWMA's 2005 Tip Fee Survey and the national average hauling cost (\$0.27/ton-mile) from the U.S. Bureau of Transportation Statistics, assuming 50 miles/trip to reach the nearest MWC.^{12,37} The total annual costs in Table 16 are presented in \$/ton of waste and in \$/yr. Calculation of the costs in \$/yr assumes each HMIWI operates at two-thirds of its capacity. The \$/yr costs range from \$4,700/yr to \$226,000/yr. Because these costs overlap significantly with the autoclave/landfill costs and because some MWCs may not accept medical waste, EPA decided to use the autoclave/landfill costs as a means of comparison to the compliance costs on a nationwide basis.

3. Commercial medical waste disposal. Some facilities may decide to contract with a commercial medical waste disposal company to pick up and dispose of the waste, instead of treating or hauling the waste themselves. Cost for this option are presented for each model HMIWI in Table 17 and were estimated using a commercial disposal fee of \$0.24/lb of waste from a memorandum prepared for the 1997 HMIWI regulation.³⁸ Although this cost is about 10 years old, it is still in the range of recent cost estimates found online:³⁹⁻⁴¹

- a. \$0.16/lb for 2006 contract for pickup and disposal of medical waste from sources at University of Kentucky
- b. \$0.35/lb for 2007 pickup and disposal of medical waste from sources at University of Texas at San Antonio
- c. \$0.22 to \$0.27/lb for 2004 pickup and disposal of medical waste from hospitals in Maine

The model costs in Table 17 are presented in \$/lb of waste and in \$/yr. Calculation of the costs in \$/yr assumes each HMIWI operates at two-thirds of its capacity. The \$/yr costs range from \$30,200/yr to \$1.45 million/yr. Because these costs are significantly more expensive than

the autoclave/landfill costs, EPA decided to use the autoclave/landfill costs as a means of comparison to the compliance costs on a nationwide basis.

III. Nationwide Costs

To determine nationwide costs for all 57 HMIWI currently operating, average emission estimates for each pollutant and each HMIWI currently operating were first compared to the MACT floor emission limits to determine which HMIWI would be impacted for a particular pollutant, and by how much. Then, the type of emission control needed to bring the HMIWI into compliance with the emission limit was determined. For example, if a HMIWI equipped with a DIFF was impacted for HCl by a substantial amount (e.g., over 50 percent), then it was determined that a packed-bed scrubber should be installed to bring the HMIWI into compliance with the HCl limit. If the HCl impact was minimal, then a less stringent control (e.g., adding more lime to the DIFF) was determined to be sufficient. This approach was taken with each pollutant individually, and the results were compared across all pollutants to determine the best combination of emission controls needed to bring the HMIWI into compliance with all of the MACT floor emission limits. See Table 18 for this list of emission controls.

Once the best combination of emission controls was determined, the model costs associated with those emission controls were assigned to the impacted HMIWI, based on which HMIWI size category (large, medium, small non-rural, small rural) the impacted HMIWI belonged. For example, large model costs for packed-bed scrubbers and ACI systems would be applied to a large HMIWI that needs to install those emission controls to comply with the HCl and CDD/CDF emission limits. The model costs that would be applied would include the control costs and monitoring costs associated with packed-bed scrubbers and ACI systems. Control costs were applied on a unit-specific basis by using model \$/flow values, which were multiplied by unit-specific gas flow rates to calculate the control costs in \$/yr. Table 18 shows the control/monitoring cost estimates applied to each HMIWI at the MACT floor and presents nationwide totals. Control costs were estimated to be approximately \$20 million/yr (including \$16 million/yr for the large units; \$3.7 million/yr for the medium units; \$33,000/yr for the small units; and \$160,000/yr for the small rural units). Monitoring costs were estimated to be approximately \$550,000/yr (including \$400,000/yr for the large units; \$140,000/yr for the medium units; \$5,000/yr for the small units; and \$6,800/yr for the small rural units).

Stack testing costs were also assigned to individual HMIWI, based on which revised emission limits the HMIWI exceeds, on average. For example, those HMIWI which exceed the revised emission limits for HCl and CDD/CDF would be required to conduct initial stack tests for those pollutants and would, therefore, be assigned costs for HCl and CDD/CDF stack tests. The total cost for multiple stack tests such as these was adjusted by two-thirds to account for travel, accommodations, test methods/sampling trains, etc. that are common to the various stack tests.³² (Opacity tests are the exception since that test method cannot be combined with any others.) Because these stack tests would only be conducted once, their costs were annualized over 15 years at 7 percent interest. Because small rural HMIWI would be required, for the first time, to conduct annual stack tests for HCl, CO, and PM, costs for those tests were assigned to those two HMIWI. Fugitive ash testing costs were assigned to all 57 HMIWI. Table 18 presents the testing costs assigned to impacted HMIWI (approximately \$110,000/yr for the large units; \$52,000/yr for the

medium units; \$3,100/yr for the small units; and \$38,000/yr for the small rural units, for a nationwide total of \$200,000/yr).

Recordkeeping and reporting costs were assigned based on which HMIWI would be impacted by the revised emission limits and would need to conduct stack tests to demonstrate compliance and conduct CMS demonstrations to reestablish their parameter limits. For those impacted HMIWI, costs were assigned for conducting CMS demonstrations, submitting notifications of performance tests and CMS demonstrations, and submitting reports of the initial performance tests. Costs to submit reports of annual stack tests were assigned to the two small rural HMIWI, which would be required to conduct annual HCl, CO, and PM tests under the re-developed regulation. Costs to submit notifications and reports of the initial fugitive ash tests were assigned to all 57 HMIWI. Table 18 presents the recordkeeping and reporting costs assigned to impacted HMIWI (approximately \$45,000/yr for the large units; \$21,000/yr for the medium units; \$2,500/yr for the small units; and \$6,000/yr for the small rural units, for a nationwide total of \$75,000/yr).

Including the costs of emission controls, monitoring, testing, and recordkeeping/reporting, the total nationwide costs at the MACT floor were estimated at approximately \$21 million/yr (including \$17 million/yr for the large units; \$3.9 million/yr for the medium units; \$44,000/yr for the small units; and \$210,000/yr for the small rural units).

The approach described above was used to estimate compliance costs for both the MACT floor and BTF options, except that for the BTF options, the type of control assigned at the MACT floor was taken into consideration in determining the type of BTF control. For example, if a HMIWI is impacted for HCl at the MACT floor and a packed-bed scrubber is determined to be necessary, then if the HMIWI is also impacted for HCl under the more stringent BTF option, the incremental control to achieve the BTF HCl limit might be to use more caustic in the packed-bed scrubber. Beyond-the-floor costs are presented in Table 19 as both an incremental increase over the MACT floor costs and as an overall total that includes both the MACT floor costs and incremental BTF increase. The incremental increase in costs beyond the floor was estimated to be:

	<u>Control</u>	<u>Monitoring</u>	<u>Testing</u>	<u>Recordkeeping and reporting</u>	<u>Total</u>
Large	\$14,000,000	\$110,000	\$18,000	\$920	\$14,000,000
Medium	\$1,100,000	\$56,000	\$12,000	\$0	\$1,200,000
Small	\$480,000	\$24,000	\$0	\$0	\$500,000
Small rural	\$360,000	\$23,800	\$5,800	\$780	\$390,000
Total	\$16,000,000	\$210,000	\$36,000	\$1,700	\$16,000,000

Costs for the primary alternative to compliance (i.e., autoclaving and landfilling the waste) were also assigned to each HMIWI, so that the costs for this alternative option could be compared to the total compliance costs for each HMIWI at the floor and beyond the floor. Regional average landfill tip fees from NSWMA's 2005 Tip Fee Survey were used in estimating the nationwide autoclave/landfill costs.¹² For example, the regional average tip fee for the Mid-Atlantic region was used in estimating the autoclave/landfill costs for HMIWI in Maryland, Pennsylvania, and

West Virginia. An autoclave/landfill cost (in \$/yr) was calculated for each HMIWI by taking the applicable model autoclave cost (in \$/lb of waste) and regional average tip fee (in \$/ton of waste), converting them into compatible units, and multiplying them by the annual operating hours and charge rate for the HMIWI (assuming each HMIWI operates at two-thirds of its capacity). See Tables 18 and 19 for a comparison of autoclave/landfill costs with MACT floor and BTF compliance costs for each HMIWI and nationwide. As shown in Tables 18 and 19, nationwide autoclave/landfill costs are approximately \$11 million/yr (including \$10 million/yr for large units; \$540,000/yr for medium units; \$40,000/yr for small units; and \$18,000/yr for small rural units). The nationwide autoclave/landfill costs are lower than the MACT floor compliance costs by 50 percent nationwide (lower by about 40 percent for large, 85 percent for medium, 10 percent for small, and 90 percent for small rural units). The difference is even larger when BTF costs are added; the autoclave/landfill costs are lower than the BTF costs by about 70 percent nationwide (lower by about 70 percent for large units, 90 percent for medium units, and 95 percent for all small and small rural units).

IV. Cost Effectiveness

The cost effectiveness of the MACT floor and BTF options was calculated for each unit by dividing the estimated compliance cost (emission control, monitoring, testing, recordkeeping, and reporting) for each unit by the estimated total emission reduction (HCl, CO, Pb, Cd, Hg, PM, CDD/CDF, NO_x, and SO₂) for each unit needed to meet the revised emission limits for those options. Emission reductions are discussed in a separate memorandum.²¹ Unit average cost effectiveness values were then calculated for each HMIWI size category and nationwide by averaging the cost effectiveness values for all HMIWI in each size category and nationwide. Table 20 presents the estimated cost effectiveness values at the floor and beyond the floor. Beyond-the-floor cost effectiveness values are presented as the incremental increase over the MACT floor and as an overall total that includes the MACT floor. As shown in Table 20, the unit average cost effectiveness of the MACT floor options was estimated to be \$25.9 million/ton for the large units; \$15.8 million/ton for the medium units; \$1.10 million/ton for the small units; and \$1.35 billion/ton for the small rural units (\$45.6 million/ton nationwide). The unit average cost effectiveness of the incremental BTF increase was estimated to be \$167,000/ton for the large units; \$118,000/ton for the medium units; \$325,000/ton for the small units; and \$1.27 million/ton for the small rural units (\$197,000/ton nationwide).

V. Economic Inputs

Using information from the *Dun & Bradstreet 2008 Million Dollar Directory*, sales and employment figures were determined for parent companies of all 57 HMIWI currently operating.⁴² These figures were then compared to the following small business size standards from the U.S. Small Business Administration (SBA), which are based on the North American Industry Classification System (NAICS) codes for the individual HMIWI:⁴³

NAICS Code	Industry Title	Size Standards
325411	Medicinal/Botanical Manufacturing	750 employees
325412	Pharmaceutical Preparation Manufacturing	750 employees
541710	R&D in Physical/Engineering/Life Sciences	500 employees

NAICS Code	Industry Title	Size Standards
562213	Solid Waste Combustors/Incinerators	\$11.5 million
611310	Colleges/Universities/Professional Schools	\$6.5 million
622110	General Medical/Surgical Hospitals	\$31.5 million
622310	Specialty Hospitals	\$31.5 million
923120	Public Health Programs	N/A
924110	Waste Management Program Administration	N/A ^a
928110	National Security	N/A

^a Although the SBA does not have a size standard for this NAICS code, a small governmental jurisdiction is defined as a government of a city, county, town, township, village, school district, or special district with a population of less than 50,000. (See 5 U.S.C. 601(5).)

Based on this comparison, it was determined that one of the HMIWI parent companies (Chambers County) could be considered a small entity because the county has a population of less than 50,000. Three other parent companies (BMWNC, Curtis Bay Energy, and South Bend Medical Bend Foundation) are slightly above the small business cutoff. All of this information is presented in Table 21. This information has been submitted along with the nationwide costs discussed above to serve as inputs for an economic impacts analysis of the re-developed HMIWI regulation.

VI. References

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Table 1. Basis for Model HMIWI Parameters

FACID	UNITID	Facility name	Unit number	City	State	Category	New/ existing	APCD code	APCD type	APCD description
1	1	Bristol-Myers Squibb Co.		Wallingford	CT	L	E	FF	Dry	Secondary chamber (1800F) and baghouse
5	5	Merck & Company, Inc.		Rahway	NJ	L	E	DIFF	Dry	Secondary chamber (1500F, 1 sec), partial quench, dry acid gas scrubber with dry lime injection, and baghouse
15	15--1	Curtis Bay Energy	Unit 1	Baltimore	MD	L	E	DIFF	Dry	Secondary chamber, dry scrubber, and baghouse
15	15--2	Curtis Bay Energy	Unit 2	Baltimore	MD	L	E	DIFF	Dry	Secondary chamber, dry scrubber, and baghouse
36	36--1	Merck & Company, Inc.	Unit 2	West Point (Upper Gwynedd Township)	PA	L	E	DIFF	Dry	Secondary/tertiary chamber (2000F, 2 sec), water quench followed by sodium bicarbonate injection system with dry reaction chamber and pulse-jet baghouse
36	36--2	Merck & Company, Inc.	Unit 5	West Point (Upper Gwynedd Township)	PA	L	E	DIFF	Dry	Secondary chamber (1800F, 2.2 sec), water quench followed by sodium bicarbonate injection system and pulse-jet baghouse
40	40	Charleston Area Medical Center, General Hospital		Charleston	WV	L	E	DIFF	Dry	Secondary chamber (1800F, 2 sec), dry injection/baghouse scrubber system with activated carbon
42	42	Stericycle, Inc.		Apopka	FL	L	E	DIFF	Dry	Secondary chamber (1800, 1 sec), dry scrubbing system with quench chamber, passive absorber, lime and carbon injection, and baghouse.
51	51	Lakeland Regional Medical Center		Lakeland	FL	L	E	DIFF	Dry	Secondary chamber (1800F, 1 sec), lime injection system, and baghouse
60	60--1	BMWNC, Inc.	Unit 1	Matthews	NC	L	E	DIFF	Dry	Secondary chamber (1641F), dry scrubber with lime and activated carbon injection, and baghouse
84	84	Mayo Clinic, Waste Management Facility		Rochester	MN	L	E	DIFF	Dry	Secondary chamber (1800F, 1 sec) and baghouse with lime and carbon injection
87	87	MedCentral Health System, Mansfield Hospital		Mansfield	OH	L	E	DIFF	Dry	Secondary chamber (1800F, 2 sec) and baghouse with lime and carbon injection system
109	109	Healthcare Environmental Services Inc.		Fargo	ND	L	E	DIFF	Dry	Secondary chamber (1800F) and dry scrubber/baghouse system with lime and carbon injection
120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	Anahuac	TX	L	N	DIFF	Dry	Secondary chamber, baghouse with virgin lime injection, urea injection, and activated carbon injection
120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	Anahuac	TX	L	N	DIFF	Dry	Secondary chamber, baghouse with virgin lime injection, urea injection, and activated carbon injection
29	29	Hamot Medical Center		Erie	PA	L	E	DIFF/WS	Dry/wet	Secondary chamber (2000F, 2 sec), lime injection system, powdered activated carbon injection system, baghouse, and vertical upflow two-stage multi-microventuri scrubber system
55	55	St. Joseph's Hospital		Tampa	FL	L	E	DIFF/WS	Dry/wet	Secondary chamber (1800F, 1 sec), lime injection, baghouse, and venturi scrubber
110	110	Stericycle, Inc.		North Salt Lake	UT	L	E	DI-ESP/WS	Dry/wet	Secondary chamber (1834F), carbon injection system, ESP, dry scrubber, and wet scrubber
125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		Greenville	NC	L	N	CA/WS	Dry/wet	Secondary chamber (1985F), rotary atomizing wet scrubber (with NaOH scrubbing medium), carbon bed adsorber, HEPA filtering system, and heat recovery system
20	20--1	Fort Detrick	Unit 5	Fort Detrick	MD	L	E	WS	Wet	Secondary chamber and rotary atomizing wet scrubber

Table 1. Basis for Model HMIWI Parameters

FACID	UNITID	Facility name	Unit number	City	State	Category	New/ existing	APCD code	APCD type	APCD description
20	20--2	Fort Detrick	Unit 6	Fort Detrick	MD	L	E	WS	Wet	Secondary chamber and rotary atomizing wet scrubber
43	43	Boca Raton Community Hospital		Boca Raton	FL	L	E	WS	Wet	Secondary chamber (1800F, 1 sec) and rotary atomizing wet scrubber system with caustic soda injection
44	44	Bethesda Memorial Hospital		Boynton Beach	FL	L	E	WS	Wet	Secondary chamber (1800F, 2 sec) and rotary atomizing scrubber with mist eliminator
46	46	Holy Cross Hospital		Fort Lauderdale	FL	L	E	WS	Wet	Secondary chamber (1800F, 1 sec) and venturi scrubber with packed bed absorption unit using dilute NaOH
48	48	Memorial Regional Hospital		Hollywood	FL	L	E	WS/WESP	Wet	Secondary chamber (1800F, 1 sec), packed column gas scrubber, and wet ESP
54	54	Bayfront Medical Center		St. Petersburg	FL	L	E	WS	Wet	Secondary chamber (1800F, 1 sec) and flux force/condensation collision scrubber system using dilute NaOH
59	59--1	Stericycle, Inc.	Unit 1	Haw River	NC	L	E	WS	Wet	Secondary chamber (1800F, 1 sec), rapid gas quench system, wet scrubber system consisting of a packed bed absorber and venturi scrubber, and demister.
59	59--2	Stericycle, Inc.	Unit 2	Haw River	NC	L	E	WS	Wet	Secondary chamber (1800F, 1 sec), rapid gas quench system, wet scrubber system consisting of a packed bed absorber and venturi scrubber, and demister.
65	65--1	Stericycle, Inc.	Unit 1	Clinton	IL	L	E	WS	Wet	Secondary chamber (1800F), venturi scrubber, and condensing absorber
65	65--2	Stericycle, Inc.	Unit 2	Clinton	IL	L	E	WS	Wet	Secondary chamber (1800F), venturi scrubber, and condensing absorber
71	71	Loyola University Medical Center		Maywood	IL	L	E	WS	Wet	Two secondary chambers (1600F), twin rotary atomizer scrubber using 50% caustic solution, and two demister pads
77	77	Parkview Hospital		Fort Wayne	IN	L	E	WS	Wet	Secondary chamber and wet scrubber
94	94	Stericycle, Inc.		Warren	OH	L	E	WS	Wet	Secondary chamber (1800F, 2 sec), wet scrubber
98	98--1	University of Texas Medical Branch		Galveston	TX	L	E	WS	Wet	Secondary chamber, packed tower, and venturi scrubber with activated carbon injection
106	106	Stericycle, Inc.		Kansas City	KS	L	E	WS	Wet	Secondary chamber (1800F, 2 sec), wet scrubber
130	130	Department of Veterans Affairs Medical Center		Miami	FL	L	E	WS	Wet	Secondary chamber (1800F, 1 sec), venturi scrubber, and packed tower absorber
						Avg L				
						Avg L, dry				
						Avg L, wet				
38	38	Wilkes-Barre General Hospital		Wilkes-Barre	PA	M	N	DIFF	Dry	Secondary/tertiary chambers (1800F, 2.85 sec) and dry scrubber/baghouse with lime and activated carbon injection
63	63	St. Jude Children's Research Hospital		Memphis	TN	M	E	DIFF	Dry	Secondary chamber (1528F) and baghouse with sodium bicarbonate and carbon injection
95	95	St. Joseph's Hospital		Marshfield	WI	M	E	DIFF	Dry	Secondary chamber (1800F), quench tower, and baghouse with lime/carbon injection
13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		Baltimore	MD	M	E	WS	Wet	Secondary chamber (1832F) and venturi caustic scrubber with packed-bed scrubber

Table 1. Basis for Model HMIWI Parameters

FACID	UNITID	Facility name	Unit number	City	State	Category	New/ existing	APCD code	APCD type	APCD description
16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		Baltimore	MD	M	E	WS	Wet	Secondary chamber (1800F) and venturi wet scrubber followed by saturation chamber and mist eliminator
18	18	Franklin Square Hospital Center		Baltimore	MD	M	E	WS	Wet	Secondary chamber (1800F) and venturi scrubber followed by quench chamber and mist eliminator
21	21	Washington County Hospital		Hagerstown	MD	M	E	WS	Wet	Secondary chamber and venturi caustic scrubber
25	25	Holy Spirit Hospital		Camp Hill	PA	M	E	WS	Wet	Secondary chamber (1800F) and venturi scrubber with prequench and NaOH injection
30	30	Riddle Memorial Hospital		Media	PA	M	E	WS	Wet	Secondary chamber (1800F, 2 sec), caustic packed tower scrubber, and high pressure venturi, with activated carbon injection
34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		State College	PA	M	E	WS	Wet	Secondary chamber (1900F) and rotary atomizing wet scrubber with demister
41	41	Thomas Memorial Hospital		South Charleston	WV	M	E	WS	Wet	Secondary chamber (1800F) and venturi packed tower wet scrubber with caustic injection
47	47	Malcolm Randall Veterans Affairs Medical Center		Gainesville	FL	M	E	WS	Wet	Secondary chamber (1800F, 1 sec) and wet scrubber with caustic soda injection
81	81	South Bend Medical Foundation		South Bend	IN	M	E	WS	Wet	Secondary chamber and wet scrubber
82	82	Good Samaritan Hospital		Vincennes	IN	M	E	WS	Wet	Secondary chamber and multi-chamber spray scrubber
88	88	Medina General Hospital		Medina	OH	M	E	WS	Wet	Secondary chamber (1800F, 1 sec) and wet scrubber
108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	Hamilton	MT	M	E	WS	Wet	Secondary chamber and wet scrubber
111	111	Wyoming Medical Center		Casper	WY	M	E	WS	Wet	Secondary chamber and wet scrubber
						Avge M				
						Avge M, dry				
						Avge M, wet				
86	86	Fairfield Medical Center		Lancaster	OH	S	E	WS	Wet	Secondary chamber (1800F, 1 sec) and wet scrubber
129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	Atlanta	GA	S	N	WS	Wet	Secondary chamber (1800F, 1.68 sec) and rotary atomizing wet scrubber
						Avge S				
115	115	Kona Community Hospital		Kealahakua	HI	SR	E	CC	Comb ctrl	Secondary chamber (1900F, 2 sec), no APCD
116	116	Yukon-Kuskokwim Delta Regional Hospital		Bethel	AK	SR	E	CC	Comb ctrl	Secondary chamber, no APCD
						Avge SR				

Notes:

1. Assumed values are highlighted in yellow.
2. For dry APCD, 95% HCl control assumed based on average % HCl control (96.59%) for several of the HMIWI in database equipped with dry APCD, and 99% PM control assumed based on % Pb and Cd control (99.6% and 99.2%) for a recently shutdown HMIWI (Northwest Hospital Center) equipped with a dry APCD.
3. For wet APCD, 99% HCl control assumed based on % HCl control (99.29%) for an HMIWI in database equipped with a wet APCD, and 85% PM control assumed based on % Pb and Cd control (87.2% and 88.4%) for a recently shutdown HMIWI (Northwest Hospital Center) equipped with a dry APCD.

Table 1. Basis for Model HMIWI Parameters

FACID	UNITID	Facility name	Unit number	Maximum charge rate (lb/hr)	Stack gas flow rate (dscfm)	Stack gas temperature (°F)	Operating hours (hr/yr)	HCl (ppmvd)	HCl % reduction	HCl unc. (ppmvd)	PM (gr/dscf)	PM % reduction	PM unc. (gr/dscf)
1	1	Bristol-Myers Squibb Co.		1,000	1,648	217	2,072	65.7			0.00180	99.00%	0.180
5	5	Merck & Company, Inc.		799	7,346	246	4,321	0.780			0.00330	99.00%	0.330
15	15--1	Curtis Bay Energy	Unit 1	7,083	27,698	296	8,736	85.2	93.19%	1,251	0.00823	99.00%	0.823
15	15--2	Curtis Bay Energy	Unit 2	7,083	30,578	303	8,736	76.9	92.27%	994	0.00407	99.00%	0.407
36	36--1	Merck & Company, Inc.	Unit 2	2,000	5,235	358	865	4.22			0.00156	99.00%	0.156
36	36--2	Merck & Company, Inc.	Unit 5	3,045	8,119	304	5,753	3.75			0.00255	99.00%	0.255
40	40	Charleston Area Medical Center, General Hospital		1,000	4,323	312	1,248	26.6			0.00106	99.00%	0.106
42	42	Stericycle, Inc.		1,900	7,008	327	7,951	27.1			0.00203	99.00%	0.203
51	51	Lakeland Regional Medical Center		750	3,323	212	6,247	2.68			0.00254	99.00%	0.254
60	60--1	BMWNC, Inc.	Unit 1	1,500	6,763	343	7,456	38.8	96.24%	1,031	0.00504	99.00%	0.504
84	84	Mayo Clinic, Waste Management Facility		2,000	6,516	294	6,240	15.2	96.93%	497	0.0137	99.00%	1.367
87	87	MedCentral Health System, Mansfield Hospital		600	2,351	260	3,120	24.8			0.00357	99.00%	0.357
109	109	Healthcare Environmental Services Inc.		1,686	4,478	302	1,872	72.5			0.00611	99.00%	0.611
120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	4,167	10,031	296	7,896	11.0	98.76%	888	0.00702	99.00%	0.702
120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	4,167	9,028	291	7,896	5.30	99.11%	594	0.00947	99.00%	0.947
29	29	Hamot Medical Center		1,060	3,701	122	2,080	16.6			0.00174	99.00%	0.174
55	55	St. Joseph's Hospital		1,500	3,347	400	8,008	12.5			0.00111	99.00%	0.111
110	110	Stericycle, Inc.		1,935	6,291	126	7,309	3.93			0.00449	99.00%	0.449
125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		1,000	3,124	125	625	1.58	99.996%	43,053	0.00323	99.00%	0.323
20	20--1	Fort Detrick	Unit 5	1,000	2,424	87	1,300	0.190			0.00721	85.00%	0.048

Table 1. Basis for Model HMIWI Parameters

FACID	UNITID	Facility name	Unit number	Maximum charge rate (lb/hr)	Stack gas flow rate (dscfm)	Stack gas temperature (°F)	Operating hours (hr/yr)	HCl (ppmvd)	HCl % reduction	HCl unc. (ppmvd)	PM (gr/dscf)	PM % reduction	PM unc. (gr/dscf)
20	20--2	Fort Detrick	Unit 6	1,000	2,308	92	1,300	0.353			0.00775	85.00%	0.052
43	43	Boca Raton Community Hospital		730	2,078	91	8,736	0.986			0.0104	85.00%	0.069
44	44	Bethesda Memorial Hospital		1,000	4,537	106	3,024	0.608			0.00960	85.00%	0.064
46	46	Holy Cross Hospital		1,300	3,378	124	2,964	1.18			0.0103	85.00%	0.069
48	48	Memorial Regional Hospital		1,800	4,568	143	4,992	1.02			0.00973	85.00%	0.065
54	54	Bayfront Medical Center		1,500	2,898	133	3,352	0.947			0.00543	85.00%	0.036
59	59--1	Stericycle, Inc.	Unit 1	1,911	4,002	135	8,400	4.24			0.00714	85.00%	0.048
59	59--2	Stericycle, Inc.	Unit 2	1,911	3,917	138	8,400	3.88			0.0102	85.00%	0.068
65	65--1	Stericycle, Inc.	Unit 1	1,500	3,304	143	7,665	1.12			0.00921	85.00%	0.061
65	65--2	Stericycle, Inc.	Unit 2	1,500	3,125	141	7,558	1.43			0.00878	85.00%	0.059
71	71	Loyola University Medical Center		1,650	3,526	156	4,800	2.22			0.0105	85.00%	0.070
77	77	Parkview Hospital		1,200	2,766	114	8,395	2.68	99.29%	380	0.0109	85.00%	0.073
94	94	Stericycle, Inc.		1,400	2,737	138	7,904	0.661			0.00617	85.00%	0.041
98	98--1	University of Texas Medical Branch		1,500	4,534	111	5,328	2.12			0.0147	85.00%	0.098
106	106	Stericycle, Inc.		1,500	3,590	152	8,760	0.567			0.00828	85.00%	0.055
130	130	Department of Veterans Affairs Medical Center		1,000	6,422	155	4,160	8.32	99.00%	832	0.0111	85.00%	0.074
				1,500	3,959	154	5,997	3.82	98.76%	888	0.007		0.108
						291		24.83	96.59%		0.004		
						127		1.12	99.15%		0.010		
38	38	Wilkes-Barre General Hospital		400	2,063	274	4,472	8.95	95.00%	179	0.00399	99.00%	0.399
63	63	St. Jude Children's Research Hospital		500	2,333	276	1,050	27.5	95.00%	551	0.00505	99.00%	0.505
95	95	St. Joseph's Hospital		500	1,634	223	1,404	5.27	95.00%	105	0.00294	99.00%	0.294
13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		500	1,972	189	1,440	0.708	99.00%	71	0.0126	85.00%	0.084

Table 1. Basis for Model HMIWI Parameters

FACID	UNITID	Facility name	Unit number	Maximum charge rate (lb/hr)	Stack gas flow rate (dscfm)	Stack gas temperature (°F)	Operating hours (hr/yr)	HCl (ppmvd)	HCl % reduction	HCl unc. (ppmvd)	PM (gr/dscf)	PM % reduction	PM unc. (gr/dscf)
16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		320	1,890	179	1,350	1.39	99.00%	139	0.0294	85.00%	0.196
18	18	Franklin Square Hospital Center		500	2,999	54	5,408	1.48	99.00%	148	0.0256	85.00%	0.170
21	21	Washington County Hospital		500	1,834	112	2,496	6.26	99.00%	626	0.0197	85.00%	0.131
25	25	Holy Spirit Hospital		500	1,702	99	3,944	0.736	99.00%	74	0.0164	85.00%	0.110
30	30	Riddle Memorial Hospital		500	1,730	239	2,920	2.10	99.00%	210	0.0124	85.00%	0.083
34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		500	2,117	175	1,022	1.27	99.00%	127	0.0239	85.00%	0.159
41	41	Thomas Memorial Hospital		470	1,526	146	2,080	2.62	99.00%	262	0.0261	85.00%	0.174
47	47	Malcolm Randall Veterans Affairs Medical Center		495	1,645	115	1,664	4.69	99.00%	469	0.0173	85.00%	0.115
81	81	South Bend Medical Foundation		470	2,325	121	2,028	12.3	99.00%	1,230	0.01159	85.00%	0.077
82	82	Good Samaritan Hospital		500	1,352	128	2,574	1.58	99.00%	158	0.0137	85.00%	0.091
88	88	Medina General Hospital		300	1,153	100	3,016	3.29	99.00%	329	0.0267	85.00%	0.178
108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	500	1,790	112	1,248	0.455	99.00%	46	0.0216	85.00%	0.144
111	111	Wyoming Medical Center		400	1,505	130	989	1.17	99.00%	117	0.00336	85.00%	0.022
				500	1,790	130	2,028	2.10		158	0.016		0.144
						258		8.95			0.004		
						136		1.53			0.018		
86	86	Fairfield Medical Center		95	1,095	97	5,018	1.03	99.00%	103	0.0137	85.00%	0.091
129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	120	715	163	2,920	1.30	99.00%	130	0.00760	85.00%	0.051
				108	905	130	3,969	1.16		116	0.011		0.071
115	115	Kona Community Hospital		200	684	1,787	1,430	135		135	0.0128		0.0128
116	116	Yukon-Kuskokwim Delta Regional Hospital		50	559	1,457	1,560	298		298	0.0162		0.0162
				125	621	1,622	1,495	216		216	0.015		0.015

Notes:

1. Assumed values are highlighted in yellow.
2. For dry APCD, 95% HCl control assumed based on average % HCl control (96.59%) for several of the HMIWI in database equipped with dry APCD, and 99% PM control assumed based on % Pb and Cd control (99.6% and 99.2%) for a recently shutdown HMIWI (Northwest Hospital Center) equipped with a dry APCD.
3. For wet APCD, 99% HCl control assumed based on % HCl control (99.29%) for an HMIWI in database equipped with a wet APCD, and 85% PM control assumed based on % Pb and Cd control (87.2% and 88.4%) for a recently shutdown HMIWI (Northwest Hospital Center) equipped with a dry APCD.

Table 1. Basis for Model HMIWI Parameters

FACID	UNITID	Facility name	Unit number	NO _x (lb/yr)	NO _x (lb/hr)	NO _x (lb/lb waste)	NO _x (lb/MMBtu)
1	1	Bristol-Myers Squibb Co.		2,273	1.10	0.0011	0.13
5	5	Merck & Company, Inc.		19,121	4.43	0.0055	0.65
15	15--1	Curtis Bay Energy	Unit 1	226,518	25.93	0.0037	0.43
15	15--2	Curtis Bay Energy	Unit 2	237,734	27.21	0.0038	0.45
36	36--1	Merck & Company, Inc.	Unit 2	2,090	2.42	0.0012	0.14
36	36--2	Merck & Company, Inc.	Unit 5	21,826	3.79	0.0012	0.15
40	40	Charleston Area Medical Center, General Hospital		2,452	1.96	0.0020	0.23
42	42	Stericycle, Inc.		39,974	5.03	0.0026	0.31
51	51	Lakeland Regional Medical Center		9,015	1.44	0.0019	0.23
60	60--1	BMWNC, Inc.	Unit 1	24,601	3.30	0.0022	0.26
84	84	Mayo Clinic, Waste Management Facility		35,973	5.76	0.0029	0.34
87	87	MedCentral Health System, Mansfield Hospital		4,418	1.42	0.0024	0.28
109	109	Healthcare Environmental Services Inc.		8,612	4.60	0.0027	0.32
120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	28,677	3.63	0.0009	0.10
120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	31,733	4.02	0.0010	0.11
29	29	Hamot Medical Center		6,563	3.16	0.0030	0.35
55	55	St. Joseph's Hospital		14,483	1.81	0.0012	0.14
110	110	Stericycle, Inc.		67,691	9.26	0.0048	0.56
125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		845	1.35	0.0014	0.16
20	20--1	Fort Detrick	Unit 5	3,068	2.36	0.0024	0.28

Table 1. Basis for Model HMIWI Parameters

FACID	UNITID	Facility name	Unit number	NO _x (lb/yr)	NO _x (lb/hr)	NO _x (lb/lb waste)	NO _x (lb/MMBtu)
20	20--2	Fort Detrick	Unit 6	3,068	2.36	0.0024	0.28
43	43	Boca Raton Community Hospital		15,052	1.72	0.0024	0.28
44	44	Bethesda Memorial Hospital		8,102	2.68	0.0027	0.32
46	46	Holy Cross Hospital		4,403	1.49	0.0011	0.13
48	48	Memorial Regional Hospital		20,301	4.07	0.0023	0.27
54	54	Bayfront Medical Center		8,694	2.59	0.0017	0.20
59	59--1	Stericycle, Inc.	Unit 1	37,888	4.51	0.0024	0.28
59	59--2	Stericycle, Inc.	Unit 2	37,888	4.51	0.0024	0.28
65	65--1	Stericycle, Inc.	Unit 1	27,136	3.54	0.0024	0.28
65	65--2	Stericycle, Inc.	Unit 2	26,757	3.54	0.0024	0.28
71	71	Loyola University Medical Center		11,087	2.31	0.0014	0.16
77	77	Parkview Hospital		23,777	2.83	0.0024	0.28
94	94	Stericycle, Inc.		26,118	3.30	0.0024	0.28
98	98--1	University of Texas Medical Branch		12,637	2.37	0.0016	0.19
106	106	Stericycle, Inc.		31,014	3.54	0.0024	0.28
130	130	Department of Veterans Affairs Medical Center		13,396	3.22	0.0032	0.38
							0.28
38	38	Wilkes-Barre General Hospital		4,222	0.94	0.0024	0.28
63	63	St. Jude Children's Research Hospital		1,648	1.57	0.0031	0.37
95	95	St. Joseph's Hospital		1,657	1.18	0.0024	0.28
13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		1,652	1.15	0.0023	0.27

Table 1. Basis for Model HMIWI Parameters

FACID	UNITID	Facility name	Unit number	NO _x (lb/yr)	NO _x (lb/hr)	NO _x (lb/lb waste)	NO _x (lb/MMBtu)
16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		1,328	0.98	0.0031	0.36
18	18	Franklin Square Hospital Center		10,116	1.87	0.0037	0.44
21	21	Washington County Hospital		2,946	1.18	0.0024	0.28
25	25	Holy Spirit Hospital		4,654	1.18	0.0024	0.28
30	30	Riddle Memorial Hospital		3,398	1.16	0.0023	0.27
34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		1,206	1.18	0.0024	0.28
41	41	Thomas Memorial Hospital		1,870	0.90	0.0019	0.23
47	47	Malcolm Randall Veterans Affairs Medical Center		2,670	1.60	0.0032	0.38
81	81	South Bend Medical Foundation		460	0.23	0.0005	0.06
82	82	Good Samaritan Hospital		3,038	1.18	0.0024	0.28
88	88	Medina General Hospital		2,136	0.71	0.0024	0.28
108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	1,884	1.51	0.0030	0.36
111	111	Wyoming Medical Center		1,343	1.36	0.0034	0.40
							0.28
86	86	Fairfield Medical Center		1,125	0.22	0.0024	0.28
129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	827	0.28	0.0024	0.28
							0.28
115	115	Kona Community Hospital		675	0.47	0.0024	0.28
116	116	Yukon-Kuskokwim Delta Regional Hospital		163	0.10	0.0021	0.25
							0.26

Notes:

1. Assumed values are highlighted in yellow.
2. For dry APCD, 95% HCl control assumed based on average % HCl control (96.59%) for several of the HMIWI in database equipped with dry APCD, and 99% PM control assumed based on % Pb and Cd control (99.6% and 99.2%) for a recently shutdown HMIWI (Northwest Hospital Center) equipped with a dry APCD.
3. For wet APCD, 99% HCl control assumed based on % HCl control (99.29%) for an HMIWI in database equipped with a wet APCD, and 85% PM control assumed based on % Pb and Cd control (87.2% and 88.4%) for a recently shutdown HMIWI (Northwest Hospital Center) equipped with a dry APCD.

Table 2. Summary of HMIWI Control Option Costs

Control option	Pollutants controlled	Large	Medium	Small	Small rural
A. Total Capital Investment, \$					
1. Packed-bed scrubber	HCl, SO ₂	\$452,658	\$327,726	\$276,618	\$259,582
2. Fabric filter	Pb, Cd, Hg, PM, CDD/CDF	\$1,017,892	\$805,145	\$718,112	\$689,101
3. Dry injection fabric filter	HCl, Pb, Cd, Hg, PM, CDD/CDF, SO ₂	\$1,363,508	\$1,074,716	\$956,574	\$917,193
4. Secondary chamber retrofit	CO, CDD/CDF	\$346,250	\$129,951	\$87,914	\$75,338
5. Selective noncatalytic reduction	NO _x	\$585,709	\$368,048	\$186,362	\$204,799
6. Activated carbon injection system	Hg, CDD/CDF	\$11,989	\$7,425	\$4,899	\$3,841
B. Annual Costs, \$/yr					
1. Packed-bed scrubber	HCl, SO ₂	\$104,101	\$65,687	\$61,608	\$51,634
2. Fabric filter	Pb, Cd, Hg, PM, CDD/CDF	\$267,793	\$160,542	\$161,434	\$130,164
3. Dry injection fabric filter	HCl, Pb, Cd, Hg, PM, CDD/CDF, SO ₂	\$347,053	\$206,105	\$201,708	\$168,361
4. Secondary chamber retrofit	PM, CO, CDD/CDF	\$80,819	\$27,090	\$19,999	\$15,119
5. Selective noncatalytic reduction	NO _x	\$67,918	\$41,529	\$22,910	\$23,350
6. Activated carbon injection system	Hg, CDD/CDF	\$56,313	\$12,522	\$14,134	\$5,412
7. Increase caustic flow	HCl, SO ₂	\$55	\$7	\$5	\$229
8. Increase lime flow	HCl, SO ₂	\$20,895	\$563	\$423	\$194
9. Increase NaHCO ₃ flow	HCl, SO ₂	\$81,587	\$2,200	\$1,650	\$756
10. Increase carbon flow	Hg, CDD/CDF	\$42,585	\$6,388	\$6,388	\$1,597
11. Increase natural gas	PM, CO, CDD/CDF	\$30,207	\$4,531	\$4,531	\$1,133
12. Improve FF performance	Pb, Cd, Hg, PM, CDD/CDF	\$8,608	\$8,608	\$1,937	\$1,291
13. Increase NO _x reagent	NO _x	\$1,836	\$612	\$1,224	\$459
14. Autoclave/landfill	Alternative to compliance	\$205,273	\$27,758	\$19,497	\$9,139
15. Haul waste to municipal waste combustor	Alternative to compliance	\$225,944	\$25,105	\$10,042	\$4,707
16. Commercial medical waste disposal	Alternative to compliance	\$1,447,200	\$160,800	\$64,320	\$30,150

Notes:

1. National average landfill tip fees used to estimate model autoclave costs.
2. National average incinerator tip fees used to estimate model costs to haul waste to municipal waste combustor.

Table 3. Packed Bed Scrubber Costs

Parameters/Costs	Equation	Large	Medium	Small	Small rural
A. Parameters					
1. Incinerator capacity, lb/hr (C)		1,500	500	100	125
2. Temperature into quench, F (T1)		300	300	130	1,600
3. Temperature out of PB to ID fan, F (T2)		130	130	130	130
4. Annual operating hours, hr/yr (H)		6,000	2,000	4,000	1,500
5. Exhaust gas flow rate, dscfm (Qd)		4,000	1,800	900	600
6. Assumed moisture content in gas entering quench, % (M)		10	10	10	10
7. Exhaust gas flow rate, scfm (Qw)	= (Qd) / (1 - M/100)	4,444	2,000	1,000	667
8. Water added in quench, scfm (Qh)	= ((7.010 x (T1 - 77°F) - 6.958 x (T2 - 77°F)) x 0.9 + (8.154 x (T1 - 77°F) - 8.064 x (T2 - 77°F)) x 0.1) x (lb-mole/385 scf) x Qw / (1,160 Btu/lb) / (18 lb/lb-mole) x (0.7302 ft ³ -atm/lb-mol-°R) x 528°R / 1 atm	259	116	0	335
9. Actual flow out of PB, acfm (Qa)	= (Qw + Qh) x (460°F + T2)/(528°R)	5,256	2,365	1,118	1,119
10. HCl concentration, ppmvd (HCl)		25	9	1.2	220
11. Operating labor rate, \$/hr (LR)		\$24	\$24	\$24	\$24
12. Electricity cost, \$/kWh (EC)		\$0.06	\$0.06	\$0.06	\$0.06
13. Caustic cost, \$/ton (CC)		\$357	\$357	\$357	\$357
14. Sewage disposal cost, \$/1,000 gal (SDC)		\$3.80	\$3.80	\$3.80	\$3.80
15. Water cost, \$/1,000 gal (WC)		\$0.20	\$0.20	\$0.20	\$0.20
16. Assumed pressure drop through control system, inches of water (ΔP)		15	15	15	15
17. Surface area-to-volume ratio for 1" dia. Ceramic Raschig rings, ft ² /ft ³ (SAV)		58	58	58	58
18. Minimum packing wetting rate, ft ² /hr (WR)		1	1	1	1
19. Water density, lb/ft ³ (Wd)		62.4	62.4	62.4	62.4
20. Water circulation flow rate, lb/hr-ft ² (Gs)	= SAV x Wd x WR	4,705	4,705	4,705	4,705
21. Estimated column cross-sectional area from separate analysis, ft ² (A)		19.2	8.6	3.8	4.7
22. Water circulation rate, gpm (GPM)	= Gs x A x (1 hr/60 min) x (1 gal/8.33 lb)	181	81	36	44
23. Water head, ft of water (Head)		60	60	60	60
24. Wastewater (blowdown) flow, gpm (B)	= (HCl/1000000) x (Qd) x (lb-mole/385 ft ³) x (1 lb-mole NaCl/1 lb-mole HCl) x (58.2 lb NaCl/lb-mole NaCl) x (1 lb wastewater/0.1 lb NaCl) x (1 gal/8.33 lb)	0.018	0.003	0.0002	0.024
25. Capital recovery factor, 15-yr equipment life, 7% interest (CRF)	= [i x (1 + i) ^a] / [(1 + i) ^a - 1], where i = interest rate, a = equipment life	0.10979	0.10979	0.10979	0.10979
26. Chemical Engineering plant cost index					
a. 2007		525.4	525.4	525.4	525.4
b. 1989		357.5	357.5	357.5	357.5

Table 3. Packed Bed Scrubber Costs

Parameters/Costs	Equation	Large	Medium	Small	Small rural
B. Total Capital Investment, \$	$= (27.6 \times Q_d + 109,603) \times (525.4/357.5) \times (1.4 \text{ retrofit factor})$	\$452,658	\$327,726	\$276,618	\$259,582
C. Direct Annual Costs, \$/yr					
1. Operating labor	$= (\text{if } Q_a < 20,000, \text{ then } 0, \text{ otherwise } 0.5 \text{ hr/shift}) \times H \times LR$	\$0	\$0	\$0	\$0
2. Supervisory labor	$= 0.15 \times (\text{operating labor})$	\$0	\$0	\$0	\$0
3. Maintenance labor	$= (0.5 \text{ hr}/8\text{-hr shift}) \times H \times (LR \times 1.1)$	\$9,900	\$3,300	\$6,600	\$2,475
4. Maintenance materials	$= 0.02 \times TCI$	\$9,053	\$6,555	\$5,532	\$5,192
5. Electricity	$= (0.000181 \times Q_a \times \Delta P \times H \times EC) + (0.000289 \times GPM \times \text{Head} \times H \times EC)$	\$5,172	\$775	\$755	\$221
6. Caustic	$= HCl \times (3.117E-9) \times Q \times H \times CC$	\$667	\$36	\$5	\$220
7. Sewage disposal	$= B \times (60 \text{ min}/\text{hr}) \times H \times SDC$	\$25	\$1	\$0	\$8
8. Makeup water	$= (B + Q_h \times (\text{lb-mole}/385 \text{ scf}) \times (18 \text{ lb}/\text{lb-mole}) \times (\text{gal}/8.33 \text{ lb})) \times (60 \text{ min}/\text{hr}) \times H \times WC$	\$106	\$16	\$0	\$34
D. Indirect Annual Costs, \$/yr					
1. Overhead	$= 0.6 \times (\text{labor} + \text{maintenance materials})$	\$11,372	\$5,913	\$7,279	\$4,600
2. Property taxes, insurance, and administration	$= 0.04 \times TCI$	\$18,106	\$13,109	\$11,065	\$10,383
3. Capital recovery	$= CRF \times TCI$	\$49,699	\$35,983	\$30,371	\$28,501
E. Total Annual Cost					
1. \$/yr	$= \text{Direct Annual Costs} + \text{Indirect Annual Costs}$	\$104,101	\$65,687	\$61,608	\$51,634
2. \$/dscfm	$= (\$/\text{yr}) / Q$	\$26.03	\$36.49	\$68.45	\$86.06

Sources:

1. Cost equations: Model Plant Description and Cost Report (II-A-112); and Wet Scrubber Cost Memorandum (IV-B-30).
2. Operating labor rate: Bureau of Labor Statistics, Occupational Employment Statistics, May 2007 National Industry-Specific Occupational Employment and Wage Estimates.
3. Electricity cost: Energy Information Administration. Average Retail Price of Electricity: 2006.
4. Caustic cost: Purchasing.com. Caustic soda price hike is on the horizon. August 29, 2007.
5. Sewage disposal cost, water cost: Air Compliance Advisor, version 7.5.

Table 4. Fabric Filter Costs

Parameters/Costs	Equation	Large	Medium	Small	Small rural
A. Parameters					
1. Incinerator capacity, lb/hr (C)		1,500	500	100	125
2. Annual operating hours, hr/yr (H)		6,000	2,000	4,000	1500
3. Exhaust gas flow rate, dscfm (Q)		4,000	1,800	900	600
4. PM concentration, gr/dscf (PM)		0.10	0.15	0.07	0.015
5. Water vapor in gas from incinerator (10% by weight)					
a. lb/min	= $Q / (385 \text{ ft}^3/\text{lb-mol}) \times (29 \text{ lb/lb-mol}) \times \text{moisture content } (0.10)$	30.1	13.6	6.8	4.5
b. scfm	= $(\text{lb/min}) / (18 \text{ lb/lb-mol}) \times (385 \text{ ft}^3/\text{lb-mol})$	644	290	145	97
6. Enthalpy change in quench (1800°F to 300°F)					
a. Dry gas from incinerator, Btu/lb air	= $[7.010 \times (300^\circ\text{F} - 77^\circ\text{F}) - 7.554 \times (1800^\circ\text{F} - 77^\circ\text{F})] / (29 \text{ lb/lb-mol})$	395	395	395	395
b. Water vapor from incinerator, Btu/lb water vapor	= $[8.154 \times (300^\circ\text{F} - 77^\circ\text{F}) - 9.215 \times (1800^\circ\text{F} - 77^\circ\text{F})] / (18 \text{ lb/lb-mol})$	781	781	781	781
c. Total gas stream, Btu/yr	= $[(\text{Btu/lb air}) \times Q / (385 \text{ ft}^3/\text{lb-mol}) \times (29 \text{ lb/lb-mol}) \times (60 \text{ min/hr}) \times H] + [(\text{Btu/lb water vapor}) \times Q \times (0.00753 \text{ lb water vapor/ft}^3) \times (60 \text{ min/hr}) \times H]$	5.13E+10	7.70E+09	7.70E+09	1.92E+09
d. Cooling water					
i. Heat of vaporization at 77°F, Btu/lb		1,050	1,050	1,050	1,050
ii. Sensible heat for vapor, Btu/lb		85	85	85	85
iii. Total, Btu/lb water		1,135	1,135	1,135	1,135
7. Cooling water evaporated, lb/yr					
a. lb/yr	= $[\text{enthalpy change (total gas stream, Btu/yr)}] / [\text{enthalpy change (cooling water, Btu/lb)}]$	4.52E+07	6.78E+06	6.78E+06	1.70E+06
b. scfm	= $[\text{cooling water evaporated (lb/yr)}] / (18 \text{ lb/lb-mol}) \times (385 \text{ ft}^3/\text{lb-mol}) / (H \times 60 \text{ min/hr})$	2,686	1,209	604	403
8. Actual gas flow into fabric filter, acfm (AQ)	= $[Q + (\text{water vapor in gas from incinerator, scfm}) + (\text{water vapor added in quench, i.e., cooling water evaporated, scfm})] \times [(300^\circ\text{F} + 460^\circ\text{F})/528^\circ\text{R}]$	10,551	4,748	2,374	1,583
9. Operating labor rate, \$/hr (LR)		\$24	\$24	\$24	\$24
10. Electricity cost, \$/kWh (EC)		\$0.06	\$0.06	\$0.06	\$0.06
11. Water cost, \$/1,000 gal (WC)		\$0.20	\$0.20	\$0.20	\$0.20
12. Compressed air cost, \$/1,000 ft ³ (CAC)		\$0.24	\$0.24	\$0.24	\$0.24
13. Dust disposal cost, \$/ton (DDC)		\$34.29	\$34.29	\$34.29	\$34.29
14. Capital recovery factors	= $[i \times (1 + i)^a] / [(1 + i)^a - 1]$, where i = interest rate, a = equipment life				
a. Bag CRF, 2-yr life, 7% interest		0.55309	0.55309	0.55309	0.55309
b. Cage CRF, 4-yr life, 7% interest		0.29523	0.29523	0.29523	0.29523
c. Equipment CRF, 20-yr life, 7% interest		0.09439	0.09439	0.09439	0.09439
15. Cost index					
a. 2007		525.4	525.4	525.4	525.4
b. 1989		357.5	357.5	357.5	357.5
B. Total Capital Investment, \$					
	= $(47.0 \times Q + 306,720) \times (1.4 \text{ retrofit cost factor}) \times (525.4/357.5)$	\$1,017,892	\$805,145	\$718,112	\$689,101

Table 4. Fabric Filter Costs

Parameters/Costs	Equation	Large	Medium	Small	Small rural
C. Direct Annual Operating Costs, \$/yr					
1. Electricity	= (0.746 kW/hp) x hp (0.0072 x Q + 3.20) x H x EC	\$8,823	\$1,485	\$1,779	\$518
3. Evaporative cooler water	= (0.1007 x Q + 23.1506) gal/min x (60 min/hr) x H x WC	\$30,668	\$4,906	\$5,461	\$1,504
4. Operating labor	= (1 hr/shift) x (1 shift/8 hr) x H x LR	\$18,000	\$6,000	\$12,000	\$4,500
5. Supervisory labor	= 0.15 x (operating labor)	\$2,700	\$900	\$1,800	\$675
6. Maintenance labor	= (0.5 hr/shift) x (1 shift/8 hr) x H x (LR x 1.1)	\$9,900	\$3,300	\$6,600	\$2,475
7. Maintenance materials	= 0.02 x TCI	\$20,358	\$16,103	\$14,362	\$13,782
8. Compressed air	= AQ x (2 ft ³ air/1,000 ft ³ filtered) x (60 min/hr) x H x CAC	\$1,823	\$273	\$273	\$68
9. Dust disposal	= (PM gr/dscf x Q x 60 min/hr x 1 lb/7,000 gr) x (1 ton/2,000 lb) x H x DDC	\$353	\$79	\$37	\$2
10. Bag replacement					
a. Bag cost	= AQ x (\$2.5/ft ²) x (525.4/317.4) x (1.08 taxes and freight ratio)/(3.5 ft/min G/C ratio)	\$13,473	\$6,063	\$3,031	\$2,021
b. Bag replacement labor cost	= AQ x (0.15 hr/bag)/(18 ft ² bag area)/(3.5 ft/min G/C ratio) x LR	\$603	\$271	\$136	\$90
c. Bag replacement cost	= Bag CRF x [(total bag cost) + (bag replacement labor cost)]	\$7,785	\$3,503	\$1,752	\$1,168
11. Cage replacement					
a. Number of bags	= AQ/(3.5 ft/min G/C ratio)/(18 ft ² bag area)	\$167	\$75	\$38	\$25
b. Cage replacement labor cost	= bag replacement labor cost	\$603	\$271	\$136	\$90
c. Cage replacement cost	= Cage CRF x [single-cage cost (4.941+ 0.163 x 18 ft ² bag area) x (number of bags) x (525.4/317.4) + (cage replacement labor cost)]	\$823	\$370	\$185	\$123
D. Indirect Annual Costs, \$/yr					
1. Overhead	= 0.6 x (labor + maintenance materials)	\$30,575	\$15,782	\$20,857	\$12,859
2. Property taxes, insurance, and administration	= 0.04 x TCI	\$40,716	\$32,206	\$28,724	\$27,564
3. Capital recovery	= Equipment CRF x (TCI - bag replacement cost - cage replacement cost)	\$95,269	\$75,634	\$67,602	\$64,924
E. Total Annual Cost					
1. \$/yr	= Direct Annual Costs + Indirect Annual Costs	\$267,793	\$160,542	\$161,434	\$130,164
2. \$/dscfm	= (\$/yr) / Q	\$66.95	\$89.19	\$179.37	\$216.94

Sources:

1. Cost equations: Model Plant Description and Cost Report (II-A-112); and Dry Injection Fabric Filter Cost Memorandum (IV-B-32).
2. Operating labor rate: Bureau of Labor Statistics, Occupational Employment Statistics, May 2007 National Industry-Specific Occupational Employment and Wage Estimates
3. Electricity cost: Energy Information Administration. Average Retail Price of Electricity: 2006.
4. Water cost: Air Compliance Advisor, version 7.5.
5. Compressed air cost: P2Pays.org. Energy Tips – Compressed Air. Compressed Air Tip Sheet #1. August 2004.
6. Dust disposal cost: NSWMA's 2005 Tip Fee Survey

Table 5. Dry Injection Fabric Filter Costs

Parameters/Costs	Equation	Large	Medium	Small	Small rural
A. Parameters					
1. Incinerator capacity, lb/hr (C)		1,500	500	100	125
2. Annual operating hours, hr/yr (H)		6,000	2,000	4,000	1,500
3. Exhaust gas flow rate, dscfm (Q)		4,000	1,800	900	600
4. HCl concentration, ppmvd (HCl)		890	160	120	220
5. PM concentration, gr/dscf (PM)		0.10	0.15	0.07	0.015
6. Water vapor in gas from incinerator (10% by weight)					
a. lb/min	= $Q / (385 \text{ ft}^3/\text{lb-mol}) \times (29 \text{ lb}/\text{lb-mol}) \times \text{moisture content } (0.10)$	30.1	13.6	6.8	4.5
b. scfm	= $(\text{lb}/\text{min}) / (18 \text{ lb}/\text{lb-mol}) \times (385 \text{ ft}^3/\text{lb-mol})$	644	290	145	97
7. Enthalpy change in quench (1800°F to 300°F)					
a. Dry gas from incinerator, Btu/lb air	= $[7.010 \times (300^\circ\text{F} - 77^\circ\text{F}) - 7.554 \times (1800^\circ\text{F} - 77^\circ\text{F})] / (29 \text{ lb}/\text{lb-mol})$	395	395	395	395
b. Water vapor from incinerator, Btu/lb water vapor	= $[8.154 \times (300^\circ\text{F} - 77^\circ\text{F}) - 9.215 \times (1800^\circ\text{F} - 77^\circ\text{F})] / (18 \text{ lb}/\text{lb-mol})$	781	781	781	781
c. Total gas stream, Btu/yr	= $[(\text{Btu}/\text{lb air}) \times Q / (385 \text{ ft}^3/\text{lb-mol}) \times (29 \text{ lb}/\text{lb-mol}) \times (60 \text{ min}/\text{hr}) \times H] + [(\text{Btu}/\text{lb water vapor}) \times Q \times (0.00753 \text{ lb water vapor}/\text{ft}^3) \times (60 \text{ min}/\text{hr}) \times H]$	5.13E+10	7.70E+09	7.70E+09	1.92E+09
d. Cooling water					
i. Heat of vaporization at 77°F, Btu/lb		1,050	1,050	1,050	1,050
ii. Sensible heat for vapor, Btu/lb		85	85	85	85
iii. Total, Btu/lb water		1,135	1,135	1,135	1,135
8. Cooling water evaporated, lb/yr					
a. lb/yr	= $[\text{enthalpy change (total gas stream, Btu/yr)}] / [\text{enthalpy change (cooling water, Btu/lb)}]$	4.52E+07	6.78E+06	6.78E+06	1.70E+06
b. scfm	= $[\text{cooling water evaporated (lb/yr)}] / (18 \text{ lb}/\text{lb-mol}) \times (385 \text{ ft}^3/\text{lb-mol}) / (H \times 60 \text{ min}/\text{hr})$	2,686	1,209	604	403
9. Actual gas flow into fabric filter, acfm (AQ)	= $[Q + (\text{water vapor in gas from incinerator, scfm}) + (\text{water vapor added in quench, i.e., cooling water evaporated, scfm})] \times [(300^\circ\text{F} + 460^\circ\text{F})/528^\circ\text{R}]$	10,551	4,748	2,374	1,583
10. Operating labor rate, \$/hr (LR)		\$24	\$24	\$24	\$24
11. Electricity cost, \$/kWh (EC)		\$0.06	\$0.06	\$0.06	\$0.06
12. Lime cost, \$/ton (LC)		\$95	\$95	\$95	\$95
13. Water cost, \$/1,000 gal (WC)		\$0.20	\$0.20	\$0.20	\$0.20
14. Compressed air cost, \$/1,000 ft ³ (CAC)		\$0.24	\$0.24	\$0.24	\$0.24
15. Dust disposal cost, \$/ton (DDC)		\$34.29	\$34.29	\$34.29	\$34.29
16. Capital recovery factors (CRF)	= $[i \times (1 + i)^a] / [(1 + i)^a - 1]$, where i = interest rate, a = equipment life				
a. Bag CRF, 2-yr life, 7% interest		0.55309	0.55309	0.55309	0.55309
b. Cage CRF, 4-yr life, 7% interest		0.29523	0.29523	0.29523	0.29523
c. Equipment CRF, 20-yr life, 7% interest		0.09439	0.09439	0.09439	0.09439
17. Cost index					
a. 2007		525.4	525.4	525.4	525.4
b. 1989		357.5	357.5	357.5	357.5
B. Total Capital Investment, \$	= $(63.8 \times Q + 407,498) \times (1.4 \text{ retrofit cost factor}) \times (525.4/357.5)$	\$1,363,508	\$1,074,716	\$956,574	\$917,193

Table 5. Dry Injection Fabric Filter Costs

Parameters/Costs	Equation	Large	Medium	Small	Small rural
C. Direct Annual Operating Costs, \$/yr					
1. Electricity	= (0.746 kW/hp) x hp (0.0079 x Q + 3.51) x H x EC	\$9,681	\$1,630	\$1,952	\$569
2. Makeup lime	= (2.4E-7 lb/dscf x HCl x Q) x (1 ton/2,000 lb) x (60 min/hr) x H x LC	\$14,610	\$394	\$295	\$135
3. Evaporative cooler water	= (0.1007 x Q + 23.1506) gal/min x (60 min/hr) x H x WC	\$30,668	\$4,906	\$5,461	\$1,504
4. Operating labor	= (1 hr/shift) x (1 shift/8 hr) x H x LR	\$18,000	\$6,000	\$12,000	\$4,500
5. Supervisory labor	= 0.15 x (operating labor)	\$2,700	\$900	\$1,800	\$675
6. Maintenance labor	= (0.5 hr/shift) x (1 shift/8 hr) x H x (LR x 1.1)	\$9,900	\$3,300	\$6,600	\$2,475
7. Maintenance materials	= 0.02 x TCI	\$27,270	\$21,494	\$19,131	\$18,344
8. Compressed air	= AQ x (2 ft ³ air/1,000 ft ³ filtered) x (60 min/hr) x H x CAC	\$1,823	\$273	\$273	\$68
9. Dust disposal	= [(PM gr/dscf x Q x 60 min/hr x 1 lb/7,000 gr) + (HCl x Q x 60 min/hr x 2.86E-7 lb/dscf)] x (1 ton/2,000 lb) x H x DDC	\$6,637	\$249	\$164	\$60
10. Bag replacement					
a. Bag cost	= AQ x (\$2.5/ft ²) x (525.4/317.4) x (1.08 taxes and freight ratio)/(3.5 ft/min G/C ratio)	\$13,473	\$6,063	\$3,031	\$2,021
b. Bag replacement labor cost	= AQ x (0.15 hr/bag)/(18 ft ² bag area)/(3.5 ft/min G/C ratio) x LR	\$603	\$271	\$136	\$90
c. Bag replacement cost	= Bag CRF x [(total bag cost) + (bag replacement labor cost)]	\$7,785	\$3,503	\$1,752	\$1,168
11. Cage replacement					
a. Number of bags	= AQ/(3.5 ft/min G/C ratio)/(18 ft ² bag area)	167	75	38	25
b. Cage replacement labor cost	= bag replacement labor cost	\$603	\$271	\$136	\$90
c. Cage replacement cost	= Cage CRF x [single-cage cost (4.941 + 0.163 x 18 ft ² bag area) x (number of bags) x (525.4/317.4) + (cage replacement labor cost)]	\$823	\$370	\$185	\$123
D. Indirect Annual Costs, \$/yr					
1. Overhead	= 0.6 x (labor + maintenance materials)	\$34,722	\$19,017	\$23,719	\$15,596
2. Property taxes, insurance, and administration	= 0.04 x TCI	\$54,540	\$42,989	\$38,263	\$36,688
3. Capital recovery	= Equipment CRF x (TCI - bag replacement cost - cage replacement cost)	\$127,893	\$101,080	\$90,111	\$86,455
E. Total Annual Cost					
1. \$/yr	= Direct Annual Costs + Indirect Annual Costs	\$347,053	\$206,105	\$201,708	\$168,361
2. \$/dscfm	= (\$/yr) / Q	\$86.76	\$114.50	\$224.12	\$280.60

Sources:

1. Cost equations: Model Plant Description and Cost Report (II-A-112); and Dry Injection Fabric Filter Cost Memorandum (IV-B-32).
2. Operating labor rate: Bureau of Labor Statistics, Occupational Employment Statistics, May 2007 National Industry-Specific Occupational Employment and Wage Estimates
3. Electricity cost: Energy Information Administration. Average Retail Price of Electricity: 2006.
4. Lime cost: U.S. Geological Survey. Mineral Commodity Summaries 2008. Hydrated Lime Average Value, 2007.
5. Water cost: Air Compliance Advisor, version 7.5.
6. Compressed air cost: P2Pays.org. Energy Tips – Compressed Air. Compressed Air Tip Sheet #1. August 2004.
7. Dust disposal cost: NSWMA's 2005 Tip Fee Survey.

Table 6. Secondary Chamber Retrofit Costs

Parameters/Costs	Equation	Large	Medium	Small	Small rural
A. Parameters					
1. Incinerator capacity, lb/hr (C)		1,500	500	100	125
2. Annual operating hours, hr/yr (H)		6,000	2,000	4,000	1,500
3. Exhaust gas flow rate, dscfm (Q)		4,000	1,800	900	600
4. Waste charging hours, hr/d (WCH)		24	7.5	5.5	5.5
5. Downtime days (DD)		12	4	3	3
6. Natural gas cost, \$/1,000 ft ³ (NGC)		\$7.97	\$7.97	\$7.97	\$7.97
7. Capital recovery factor, 20-yr equipment life, 7% interest (CRF)	= $[i \times (1 + i)^a] / [(1 + i)^a - 1]$, where i = interest rate, a = equipment life	0.09439	0.09439	0.09439	0.09439
8. Cost index					
a. 2007		525.4	525.4	525.4	525.4
b. 1989		357.5	357.5	357.5	357.5
B. Total Capital Investment, \$					
	= $(28.80 \times Q + 33,568) \times (525.4/357.5)$	\$218,637	\$125,520	\$87,427	\$74,729
C. Downtime Cost, \$					
	= $\$0.3/\text{lb disposal cost} \times (525.4/357.5) \times (C \times 0.67) \times WCH \times DD$	\$127,613	\$4,431	\$487	\$609
D. Direct Annual Costs, \$/yr					
1. Refractory replacement					
a. Large/medium/small models	= $0.01 \times \text{TCl for 1-sec secondary chamber}$	\$2,186	\$1,255	\$874	
b. Small rural model	= $0.02 \times \text{TCl for 1/4-sec secondary chamber}$				\$1,495
2. Auxiliary fuel	= $(0.32 \text{ Btu/lb/}^\circ\text{F}) \times (28.5 \text{ lb/lbmole}) \times (100^\circ\text{F}) \times (\text{lbmole}/385 \text{ ft}^3) \times (\text{ft}^3/1,000 \text{ Btu}) \times (Q/0.9) \times (60 \text{ min/hr}) \times H \times \text{NGC}$	\$30,207	\$4,531	\$4,531	\$1,133
3. Maintenance materials	= $0.02 \times \text{TCl}$	\$4,373	\$2,510	\$1,749	\$1,495
E. Indirect Annual Costs, \$/yr					
1. Overhead	= $0.6 \times \text{maintenance materials}$	\$2,624	\$1,506	\$1,049	\$897
2. Property taxes, insurance, and administration	= $0.04 \times \text{TCl}$	\$8,745	\$5,021	\$3,497	\$2,989
3. Capital recovery	= $\text{CRF} \times \text{TCl}$	\$20,638	\$11,848	\$8,252	\$7,054
4. Annualized downtime cost	= $\text{CRF} \times \text{downtime cost}$	\$12,046	\$418	\$46	\$58
F. Total Annual Cost					
1. \$/yr	= $\text{Direct Annual Costs} + \text{Indirect Annual Costs}$	\$80,819	\$27,090	\$19,999	\$15,119
2. \$/dscfm	= $(\$/\text{yr}) / Q$	\$20.20	\$15.05	\$22.22	\$25.20

- Sources:
1. Cost equations: Model Plant Description and Cost Report (II-A-112); and Secondary Chamber Retrofit Cost Memorandum (IV-B-33).
 2. Waste charging hours, downtime days: Model Plant Description and Cost Report (II-A-112).
 3. Natural gas cost: Energy Information Administration. Natural Gas Prices: December 2007.

Table 7. Selective Noncatalytic Reduction Costs

Parameters/Costs	Equation	Large	Medium	Small	Small rural
A. Parameters					
1. Incinerator capacity, lb/hr (C)		1,500	500	100	125
2. Annual operating hours, hr/yr (H)		6,000	2,000	4,000	1,500
3. Exhaust gas flow rate, dscfm (Q)		4,000	1,800	900	600
4. NO _x , lb/MMBtu		0.28	0.28	0.28	0.28
5. Heating value, Btu/lb (HV)		8,500	8,500	8,500	8,500
6. Urea solution cost, \$/gal (U)		\$0.85	\$0.85	\$0.85	\$0.85
7. Electricity cost, \$/kWh (EC)		\$0.06	\$0.06	\$0.06	\$0.06
8. Water cost, \$/1,000 gal (WC)		\$0.20	\$0.20	\$0.20	\$0.20
9. Capital recovery factor, 20-yr equipment life, 7% interest (CRF)	= $[i \times (1 + i)^a] / [(1 + i)^a - 1]$, where i = interest rate, a = equipment life	0.09439	0.09439	0.09439	0.09439
10. Cost index					
a. 2007		525.4	525.4	525.4	525.4
b. 1998		390.6	390.6	390.6	390.6
B. Total Capital Investment, \$ (TCI)					
1. Total Direct Capital Cost (DC)	= $[\$950/(\text{MMBtu/hr})] \times [(C \times \text{HV}) / 10^6] \times [(2,375 \text{ MMBtu/hr} / (C \times \text{HV}))^{0.577} \times (0.66 + 0.85 \times 45\% \text{ NO}_x \text{ removal efficiency}) \times (1.2 \text{ retrofit factor}) \times (525.4/390.6)]$	\$416,033	\$261,400	\$132,325	\$145,423
2. Indirect Installation Costs, \$ (IC)	= 0.2 x DC	\$83,207	\$52,280	\$26,465	\$29,085
3. Other Capital Costs, \$ (OC)	= $[0.173 \times (\text{DC} + \text{IC})] + (119.3 \text{ gal} \times \text{U})$	\$86,470	\$54,368	\$27,572	\$30,291
4. Total	= DC + IC + OC	\$585,709	\$368,048	\$186,362	\$204,799
C. Direct Annual Costs, \$/yr					
1. Maintenance	= 0.015 x TCI	\$8,786	\$5,521	\$2,795	\$3,072
2. Reagent	= $(0.36 \text{ gal/hr}) \times H \times U$	\$1,836	\$612	\$1,224	\$459
3. Electricity	= $\text{kW} [0.47 \times \text{NO}_x \times (C \times \text{HV}) / 10^6] / 9.5 \times H \times \text{EC}$	\$65	\$7	\$3	\$1
4. Water	= $(1.62 \text{ gal/hr}) \times H \times \text{WC}$	\$1,944	\$648	\$1,296	\$486
D. Indirect Annual Costs, \$/yr					
1. Capital recovery	= CRF x TCI	\$55,287	\$34,741	\$17,591	\$19,332
E. Total Annual Cost					
1. \$/yr	= Direct Annual Costs + Indirect Annual Costs	\$67,918	\$41,529	\$22,910	\$23,350
2. \$/dscfm	= $(\$/\text{yr}) / Q$	\$16.98	\$23.07	\$25.46	\$38.92

Sources:

1. Cost equations, urea solution cost: OAQPS Control Cost Manual. Section 4.2: NO_x Post-Combustion, Chapter 1: Selective Noncatalytic Reduction.
2. Heating value: Process Description Report (II-A-110).
3. Electricity cost: Energy Information Administration. Average Retail Price of Electricity: 2006.
4. Water cost: Air Compliance Advisor, version 7.5.
5. NO_x removal efficiency: Clean Air Technology Center. EPA Technical Bulletin: Nitrogen Oxides (NO_x)--Why and How They Are Controlled. 456/F-99-006R. November 1999.

Table 8. Activated Carbon Injection Costs

Parameters/Costs	Equation	Large	Medium	Small	Small rural
A. Parameters					
1. Incinerator capacity, lb/hr (C)		1,500	500	100	125
2. Annual operating hours, hr/yr (H)		6,000	2,000	4,000	1,500
3. Exhaust gas flow rate, dscfm (Q)		4,000	1,800	900	600
4. Operating labor rate, \$/hr (LR)		\$24	\$24	\$24	\$24
5. Activated carbon cost, \$/lb (ACC)		\$1.38	\$1.38	\$1.38	\$1.38
6. Dust disposal cost, \$/ton (DDC)		\$34.29	\$34.29	\$34.29	\$34.29
7. Capital recovery factor, 20-yr equipment life, 7% interest (CRF)	= $[i \times (1 + i)^a] / [(1 + i)^a - 1]$, where i = interest rate, a = equipment life	0.09439	0.09439	0.09439	0.09439
8. Cost index					
a. 2007		525.4	525.4	525.4	525.4
b. 1990		361.3	361.3	361.3	361.3
B. Total Capital Investment, \$					
	= $4,500 \times (Q/1,976)^{0.6} \times (1.2 \text{ retrofit factor}) \times (525.4/361.3)$	\$11,989	\$7,425	\$4,899	\$3,841
C. Direct Annual Costs, \$/yr					
1. Operating labor	= $(0.25 \text{ hr}/8\text{-hr shift}) \times H \times LR$	\$4,500	\$1,500	\$3,000	\$1,125
2. Supervisory labor	= $0.15 \times (\text{operating labor})$	\$675	\$225	\$450	\$169
3. Maintenance	= $0.2 \times TCI$	\$2,398	\$1,485	\$980	\$768
4. Activated carbon	= $0.00127 \times Q \times H \times ACC$	\$42,062	\$6,309	\$6,309	\$1,577
5. Dust disposal	= $0.00127 \times Q \times (1 \text{ ton}/2,000 \text{ lb}) \times H \times DDC$	\$523	\$78	\$78	\$20
D. Indirect Annual Costs, \$/yr					
1. Overhead	= $0.6 \times (\text{labor} + \text{maintenance materials})$	\$4,544	\$1,926	\$2,658	\$1,237
2. Property taxes, insurance, and administration	= $0.04 \times TCI$	\$480	\$297	\$196	\$154
3. Capital recovery	= $CRF \times TCI$	\$1,132	\$701	\$462	\$363
E. Total Annual Cost					
1. \$/yr	= Direct Annual Costs + Indirect Annual Costs	\$56,313	\$12,522	\$14,134	\$5,412
2. \$/dscfm	= $(\$/\text{yr}) / Q$	\$14.08	\$6.96	\$15.70	\$9.02

Note:

Factor of 1.27×10^{-3} for activated carbon is based on injecting carbon at a rate to achieve a carbon concentration of 338 mg/dscm (achieving reductions of 90% for Hg, 98% for CDD/CDF).

Sources:

1. Cost equations: Model Plant Description and Cost Report (II-A-112).
2. Operating labor rate: Bureau of Labor Statistics, Occupational Employment Statistics, May 2007 National Industry-Specific Occupational Employment and Wage Estimates.
3. Activated carbon cost: The Innovation Group. Chemical Profiles: Carbon, Activated. 2002. Assumed 20% price increase based on online information from Norit, an activated carbon vendor.
4. Dust disposal cost: NSWMA's 2005 Tip Fee Survey.

Table 9. Incremental Control Costs

Parameters/Costs	Equation	Large	Medium	Small	Small rural
A. Parameters					
1. Incinerator capacity, lb/hr (C)		1,500	500	100	125
2. Annual operating hours, hr/yr (H)		6,000	2,000	4,000	1,500
3. Exhaust gas flow rate, dscfm (Q)		4,000	1,800	900	600
4. Unc. HCl concentration, ppmvd (HCl _u)		890	160	120	220
5. Cont. HCl concentration, ppmvd (HCl _c)		1.1	1.5	1.2	220
6. Operating labor rate, \$/hr (LR)		\$24	\$24	\$24	\$24
7. Wastewater (blowdown) flow, gpm (B)		0.018	0.003	0.0002	0.024
8. Caustic cost, \$/ton (CC)		\$357	\$357	\$357	\$357
9. Sewage disposal cost, \$/1,000 gal (SDC)		\$3.80	\$3.80	\$3.80	\$3.80
10. Water cost, \$/1,000 gal (WC)		\$0.20	\$0.20	\$0.20	\$0.20
11. Lime cost, \$/ton (LC)		\$95	\$95	\$95	\$95
12. Sodium bicarbonate cost, \$/ton (SBC)		\$440	\$440	\$440	\$440
13. Dust disposal cost, \$/ton (DDC)		\$34.29	\$34.29	\$34.29	\$34.29
14. Activated carbon cost, \$/lb (ACC)		\$1.38	\$1.38	\$1.38	\$1.38
15. Natural gas cost, \$/1,000 ft ³ (NGC)		\$7.97	\$7.97	\$7.97	\$7.97
16. Capital recovery factors	= $[i \times (1 + i)^a] / [(1 + i)^a - 1]$, where i = interest rate, a = equipment life				
a. Bag CRF, 2-yr life, 7% interest		0.55309	0.55309	0.55309	0.55309
b. Cage CRF, 4-yr life, 7% interest		0.29523	0.29523	0.29523	0.29523
17. Total bag cost, \$/yr		\$13,473	\$13,473	\$3,031	\$2,021
18. Bag replacement labor cost, \$/yr		\$603	\$603	\$136	\$90
19. Total cage cost, \$/yr		\$2,183	\$2,183	\$491	\$327
20. Cage replacement labor cost, \$/yr		\$603	\$603	\$136	\$90
21. Urea solution cost, \$/gal (U)		\$0.85	\$0.85	\$0.85	\$0.85
B. Increase Caustic Flow					
1. Caustic, \$/yr	= HCl x (3.117E-9) x Q x H x CC	\$29	\$6	\$5	\$220
2. Sewage disposal	= B x (60 min/hr) x H x SDC	\$25	\$1	\$0	\$8
3. Makeup water	= B x (60 min/hr) x H x WC	\$1	\$0	\$0	\$0
4. Total cost					
a. \$/yr	= Caustic + Sewage disposal + Makeup water	\$55	\$7	\$5	\$229
b. \$/dscfm	= (\$/yr) / Q	\$0.01	\$0.004	\$0.006	\$0.38
C. Increase Lime Flow					
1. Makeup lime	= (2.4E-7 lb/dscf) x HCl x Q x (1 ton/2000 lb) x (60 min/hr) x H x LC	\$14,610	\$394	\$295	\$135
2. Dust disposal	= HCl x Q x (60 min/hr) x (2.86E-7 lb/dscf) x (1 ton/2,000 lb) x H x DDC	\$6,284	\$169	\$127	\$58

Table 9. Incremental Control Costs

Parameters/Costs	Equation	Large	Medium	Small	Small rural
3. Total cost					
a. \$/yr	= Makeup lime + Dust disposal	\$20,895	\$563	\$423	\$194
b. \$/dscfm	= (\$/yr) / Q	\$5.22	\$0.31	\$0.47	\$0.32
D. Increase NaHCO₃ Flow					
1. Makeup NaHCO ₃ , \$/yr	= (2.73E-7 lb/dscf x HCl x Q) x (1 ton/2000 lb) x (60 min/hr) x H x SBC	\$76,973	\$2,076	\$1,557	\$714
2. Dust disposal, \$/yr	= [(HCl x Q x 60 min/hr x 2.10E-7 lb/dscf)] x (1 ton/2,000 lb) x H x DDC	\$4,614	\$124	\$93	\$43
3. Total cost					
a. \$/yr	= Makeup NaHCO ₃ + Dust disposal	\$81,587	\$2,200	\$1,650	\$756
b. \$/dscfm	= (\$/yr) / Q	\$20.40	\$1.22	\$1.83	\$1.26
E. Increase Carbon Flow					
1. Activated carbon, \$/yr	= (1.27E-3) x Q x H x ACC	\$42,062	\$6,309	\$6,309	\$1,577
2. Dust disposal, \$/yr	= (1.27E-3) x Q x (1 ton/2,000 lb) x H x DDC	\$523	\$78	\$78	\$20
3. Total cost					
a. \$/yr	= Activated carbon + Dust disposal	\$42,585	\$6,388	\$6,388	\$1,597
b. \$/dscfm	= (\$/yr) / Q	\$10.65	\$3.55	\$7.10	\$2.66
F. Increase Natural Gas					
1. Natural gas					
a. \$/yr	= (0.32 Btu/lb/°F) x (28.5 lb/lbmole) x (100°F) x (lbmole/385 ft ³) x (ft ³ /1,000 Btu) x (Q/0.9) x (60 min/hr) x H x NGC	\$30,207	\$4,531	\$4,531	\$1,133
b. \$/dscfm	= (\$/yr) / Q	\$7.55	\$2.52	\$5.03	\$1.89
G. Improve FF Performance					
1. Bag replacement	= Bag CRF x [(total bag cost) + (bag replacement labor cost)]	\$7,785	\$7,785	\$1,752	\$1,168
2. Cage replacement	= Cage CRF x [(total cage cost) + (cage replacement labor cost)]	\$823	\$823	\$185	\$123
3. Total cost					
a. \$/yr	= Bag replacement + Cage replacement	\$8,608	\$8,608	\$1,937	\$1,291
b. \$/dscfm	= (\$/yr) / Q	\$2.15	\$4.78	\$2.15	\$2.15
H. Increase NO_x Reagent					
1. Reagent					
a. \$/yr	= (0.36 gal/hr) x H x U	\$1,836	\$612	\$1,224	\$459
b. \$/dscfm	= (\$/yr) / Q	\$0.46	\$0.34	\$1.36	\$0.77

Table 9. Incremental Control Costs

Parameters/Costs	Equation	Large	Medium	Small	Small rural
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Sources:

1. Cost equations: Model Plant Description and Cost Report (II-A-112); Wet Scrubber Cost Memorandum (IV-B-30); Dry Injection Fabric Filter Cost Memorandum (IV-B-32); and Secondary Chamber Retrofit Cost Memorandum (IV-B-33).
2. Operating labor rate: Bureau of Labor Statistics, Occupational Employment Statistics, May 2007 National Industry-Specific Occupational Employment and Wage Estimates.
3. Lime cost: U.S. Geological Survey. Mineral Commodity Summaries 2008. Hydrated Lime Average Value, 2007.
4. Dust disposal cost: NSWMA's 2005 Tip Fee Survey.
5. Natural gas cost: Energy Information Administration. Natural Gas Prices: December 2007.
6. Electricity cost: Energy Information Administration. Average Retail Price of Electricity: 2006.
7. Water cost, sewage disposal cost: Air Compliance Advisor, version 7.5.
8. Activated carbon cost: The Innovation Group. Chemical Profiles: Carbon, Activated. 2002. Assumed 20% price increase based on online information from Norit, an activated carbon vendor.
9. Sodium bicarbonate cost: Purchasing.com. April 5, 2007. Sodium bicarbonate market supports level pricing—for now.

Table 10. Maintenance and Inspection Costs

Parameters/Costs	Equation	Values
A. Parameters		
1. Cost index		
a. 2007		525.4
d. 1992		358.2
B. Maintenance/Inspection Cost, \$/yr (rounded)		
1. Company A	= \$500 x (525.4/358.2)	\$700
2. Company B	= \$350 x (525.4/358.2)	\$500
3. Company C	= \$800 x (525.4/358.2)	\$1,200
4. Company D	= \$750 x (525.4/358.2)	\$1,100
5. Average	= \sum (Companies A-D) / 4	\$900

Note:

Maintenance/inspection costs have been rounded to the nearest \$100 to be consistent with level of rounding in original costs.

Source:

Maintenance/Inspection Programs Memorandum (II-B-88).

Table 11. Monitoring Costs

Parameters/Costs	Equation	All model sizes									
		FF	WS	SNCR	Bag leak detector	CO CEMS	HCl CEMS	PM CEMS	Hg CEMS	Multi-metal CEMS	Dioxin or Hg sorbent trap biweekly monitoring
A. Parameters											
1. Recording lime/carbon flow, min/4-hr period											
2. Annual operating hours, hr/yr (H)											
3. Cost index											
a. 2007		525.4	525.4	525.4	525.4	525.4	525.4	525.4	525.4	525.4	525.4
b. 2006		499.6	499.6	499.6	499.6	499.6	499.6	499.6	499.6	499.6	499.6
c. 1997		386.5	386.5	386.5	386.5	386.5	386.5	386.5	386.5	386.5	386.5
d. 1993		359.2	359.2	359.2	359.2	359.2	359.2	359.2	359.2	359.2	359.2
e. 1992		358.2	358.2	358.2	358.2	358.2	358.2	358.2	358.2	358.2	358.2
4. Operating labor wage rate, \$/hr (LR)		\$24.00	\$24.00	\$24.00	\$24.00	\$24.00	\$24.00	\$24.00	\$24.00	\$24.00	\$24.00
5. Capital recovery factor, 20-yr equipment life, 7% interest (CRF)	= $[i \times (1 + i)^a] / [(1 + i)^a - 1]$, where i = interest rate, a = equipment life	0.09439	0.09439	0.09439	0.09439	0.09439	0.09439	0.09439	0.09439	0.09439	0.09439
C. Total Capital Investment, \$ (TCI)											
1. Planning		\$700	\$700	\$700	\$700	\$3,700	\$3,000	\$800	\$3,000		
2. Select type of equipment		\$400	\$400	\$400	\$4,100	\$9,100	\$14,700	\$11,100	\$14,700		
3. Provide support facilities		\$1,400	\$1,400	\$1,400	\$400	\$18,800	\$18,800	\$400	\$18,800		
4. Purchased equipment cost (PEC)		\$11,900	\$17,700	\$5,300	\$12,800	\$44,200	\$47,400	\$67,100	\$100,300		
5. Install and check equipment		\$1,000	\$1,000	\$1,000	\$4,400	\$16,600	\$17,700	\$17,800	\$19,700		
6. Perf. spec. tests (certif.)		\$700	\$700	\$700	\$0	\$14,300	\$11,700	\$32,400	\$38,600		
7. Prepare QA/QC plan		\$700	\$700	\$700	\$700	\$16,000	\$16,000	\$14,100	\$16,000		
8. Total capital cost	= Planning + selecting equipment + support facilities + PEC + installation + perf. spec. tests + QA/QC plan	\$16,800	\$22,600	\$10,200	\$23,100	\$123,000	\$129,000	\$144,000	\$211,000	\$210,000	\$105,000
D. Annual Costs, \$/yr											
1. Operating labor	= (5 min to record lime/carbon flow/4-hr period) x (1 hr/60 min) x H x LR										
2. Maintenance materials	= 0.02 x TCI	\$300	\$500	\$200							
3. Operation & maintenance	= Day-to-day activities + annual RATA + CGA + annual QA + O&M review and update				\$5,000	\$25,200	\$22,500	\$24,900	\$71,300		
4. Recordkeeping and reporting	= \$1,000 x (525.4/386.5)	\$1,400	\$1,400	\$1,400	\$200	\$1,100	\$1,500	\$5,800	\$1,500		
5. Overhead	= 0.6 x (labor + maintenance materials)	\$200	\$300	\$100							
6. Property taxes, insurance, and administration	= 0.04 x TCI	\$700	\$900	\$400							
7. Capital recovery	= CRF x TCI	\$1,600	\$2,100	\$1,000	\$3,200		\$18,400	\$20,500	\$30,100		
8. Total annual cost	= Operating labor + maintenance materials + recordkeeping and reporting + overhead + property taxes, insurance, and administration + capital recovery	\$4,200	\$5,200	\$3,100	\$31,500	\$149,300	\$171,400	\$195,200	\$313,900	\$57,800	\$37,900

Notes:

1. Monitoring costs have been rounded to the nearest \$100 to be consistent with level of rounding in original costs.
2. Costs to be replaced include: (a) bag leak detector replacing opacity test; (b) CO CEMS replacing CO test and secondary chamber temperature monitor; (c) HCl CEMS replacing HCl test, HCl sorbent monitor (dry scrubbers) and scrubber liquor pH monitor (wet scrubbers); (d) PM CEMS replacing PM and opacity tests and pressure drop monitor (wet scrubbers); (e) multi-metal/Hg CEMS replacing flue gas temperature monitor (wet scrubbers); (f) dioxin sorbent trap biweekly monitoring replacing fabric filter inlet temperature monitor; and (g) Hg sorbent trap biweekly monitoring replacing flue gas temperature monitor (wet scrubbers).

Sources:

1. Testing and Monitoring Options and Costs Memo (IV-B-66).
2. E-mail and attachment from Peter Westlin, EPA, to Mary Johnson, EPA. August 19, 2008. Monitoring Options for SNCR on Medical Waste Incinerators.
3. E-mail from Dan Bivins, EPA, to Mary Johnson, EPA. September 27, 2006. Cost of CO CEMS.
4. E-mail from Dan Bivins, EPA, to Mary Johnson, EPA. July 28, 2006. Some Preliminary Thoughts on the HWI Monitoring.

Table 11. Monitoring Costs

Parameters/Costs	Large		Medium		Small		Small rural	
	DIFF	ACI	DIFF	ACI	DIFF	ACI	DIFF	ACI
A. Parameters								
1. Recording lime/carbon flow, min/4-hr period	5	5	5	5	5	5	5	5
2. Annual operating hours, hr/yr (H)	6,000	6,000	2,000	2,000	4,000	4,000	1,500	1,500
3. Cost index								
a. 2007	525.4	525.4	525.4	525.4	525.4	525.4	525.4	525.4
b. 2006	499.6	499.6	499.6	499.6	499.6	499.6	499.6	499.6
c. 1997	386.5	386.5	386.5	386.5	386.5	386.5	386.5	386.5
d. 1993	359.2	359.2	359.2	359.2	359.2	359.2	359.2	359.2
e. 1992	358.2	358.2	358.2	358.2	358.2	358.2	358.2	358.2
4. Operating labor wage rate, \$/hr (LR)	\$24.00	\$24.00	\$24.00	\$24.00	\$24.00	\$24.00	\$24.00	\$24.00
5. Capital recovery factor, 20-yr equipment life, 7% interest (CRF)	0.09439	0.09439	0.09439	0.09439	0.09439	0.09439	0.09439	0.09439
C. Total Capital Investment, \$ (TCI)								
1. Planning	\$700		\$700		\$700		\$700	
2. Select type of equipment	\$400		\$400		\$400		\$400	
3. Provide support facilities	\$1,400		\$1,400		\$1,400		\$1,400	
4. Purchased equipment cost (PEC)	\$11,900		\$11,900		\$11,900		\$11,900	
5. Install and check equipment	\$1,000		\$1,000		\$1,000		\$1,000	
6. Perf. spec. tests (certif.)	\$700		\$700		\$700		\$700	
7. Prepare QA/QC plan	\$700		\$700		\$700		\$700	
8. Total capital cost	\$16,800		\$16,800		\$16,800		\$16,800	
D. Annual Costs, \$/yr								
1. Operating labor	\$3,000	\$3,000	\$1,000	\$1,000	\$2,000	\$2,000	\$800	\$800
2. Maintenance materials	\$300		\$300		\$300		\$300	
3. Operation & maintenance								
4. Recordkeeping and reporting	\$1,400		\$1,400		\$1,400		\$1,400	
5. Overhead	\$2,000	\$1,800	\$800	\$600	\$1,400	\$1,200	\$700	\$500
6. Property taxes, insurance, and administration	\$700		\$700		\$700		\$700	
7. Capital recovery	\$1,600		\$1,600		\$1,600		\$1,600	
8. Total annual cost	\$9,000	\$4,800	\$5,800	\$1,600	\$7,400	\$3,200	\$5,500	\$1,300

Notes:

1. Monitoring costs have been rounded to the n
2. Costs to be replaced include: (a) bag leak de
- (c) HCl CEMS replacing HCl test, HCl sorbent r
- opacity tests and and pressure drop monitor (w
- sorbent trap biweekly monitoring replacing fabr
- monitor (wet scrubbers).

Sources:

1. Testing and Monitoring Options and Costs M
2. E-mail and attachment from Peter Westlin, E
3. E-mail from Dan Bivins, EPA, to Mary Johns
4. E-mail from Dan Bivins, EPA, to Mary Johns

Table 12. Stack Testing Costs

Parameters/Costs	Equation	Values
A. Parameters		
1. Cost index		
a. 2007		525.4
d. 1992		358.2
B. Testing Costs, \$		
1. Method 5 (PM)	= \$8,000 x (525.4/358.2)	\$12,000
2. Method 9 (opacity)	= \$1,000 x (525.4/358.2) + \$1,500	\$2,500
3. Method 10 (CO)	= \$4,000 x (525.4/358.2) + \$1,000	\$7,000
4. Method 26 (HCl)	= \$5,000 x (525.4/358.2)	\$7,000
5. Method 29 (metals)	= \$8,000 x (525.4/358.2) + \$2,000	\$14,000
6. Method 23 (CDD/CDF)	= \$21,000 x (525.4/358.2) - \$5,000	\$26,000
7. Method 7E (NO _x)	= \$5,000 x (525.4/358.2)	\$7,000
8. Method 6C (SO ₂)	= \$5,000 x (525.4/358.2)	\$7,000

Note:

1. Initial testing costs to be annualized over 15 years at 7% interest.
2. Testing costs have been rounded to the nearest \$1,000 (except for opacity) to be consistent with level of rounding in original costs; costs also adjusted based on additional information from EPA.
3. Multiple test costs adjusted by 2/3 in nationwide cost estimates to account for travel, accommodations, methods/sampling trains, etc. common to the tests.

Sources:

1. Memorandum from R. Segall, EPA/EMB, to R. Copland, EPA/SDB. October 14, 1992. Medical Waste Incinerator Study: Emission Measurement and Continuous Monitoring. (II-B-89)
2. E-mail from Jason Dewees, EPA, to Peter Westlin, EPA. August 20, 2008. Monitoring Options for SNCR & Test Cost Questions.
3. E-mail from Jason Dewees, EPA, to Mary Johnson, EPA. August 20, 2008. Re: Monitoring Options for SNCR & Test Cost Questions.

Table 13. Visible Emissions Testing Costs

Parameters/Costs	Equation	Values
A. Parameters		
1. Operating labor rate, \$/hr (LR)		\$24
2. Capital recovery factor, 5-yr equipment life, 7% interest (CRF)	= $[i \times (1 + i)^a] / [(1 + i)^a - 1]$, where i = interest rate, a = equipment life	0.24389
B. Total Capital Investment, \$ (TCI)		
	= Combination light meter/anemometer (\$200) + digital stopwatches (2 each at \$25)	\$250
C. Direct Annual Costs, \$/yr		
1. Operating labor	= (1 hr/reading) x (3 readings/test) x (1 test/yr) x LR	\$72
D. Indirect Annual Costs, \$/yr		
1. Overhead	= 0.6 x (operating labor)	\$43
2. Property taxes, insurance, and administration	= 0.04 x TCI	\$10
3. Capital recovery	= CRF x TCI	\$61
E. Total Annual Cost, \$/yr (rounded)		
	= Direct Annual Costs + Indirect Annual Costs	\$200

Sources:

1. Professional Equipment. 2008. Light Meters Industrial and Professional: Digital Light Meter. Website: <http://www.professionalequipment.com>. Accessed July 24, 2008.
2. Cole-Parmer. 2008. Digital Stopwatches -Cole Parmer Instrument Catalog. Website: <http://www.coleparmer.com>. Accessed July 24, 2008.

Table 14. Recordkeeping and Reporting Costs

Burden item	(A) Person-hours per occurrence	(B) Number of occurrences per year	(C) Technical person-hours per year (C = A x B)	(D) Management person-hours per year (D = C x 0.05)	(E) Clerical person-hours per year (E = C x 0.1)	(F) Total person-hours per year (F = C + D + E)	(G) Cost, \$
A. Applications	N/A						
B. Surveys and Studies	N/A						
C. Reporting Requirements							
1. Read instructions	1.0	1	1.0	0.05	0.1	1.2	\$44
2. Required activities							
a. Perf. spec. tests (certif.) for CMS	16	1	16	0.8	1.6	18	\$698
3. Write report							
a. Notification of initial performance test							
i. Pollutants, fugitive ash emissions	2.0	1	2.0	0.1	0.2	2.3	\$87
ii. Fugitive ash emissions	1.0	1	1.0	0.05	0.1	1.2	\$44
b. Notification of initial CMS demonstration	2.0	1	2.0	0.1	0.2	2.3	\$87
c. Report of initial performance test							
i. Pollutants, fugitive ash emissions	8.0	1	8.0	0.4	0.8	9.2	\$349
ii. Fugitive ash emissions	2.0	1	2.0	0.1	0.2	2.3	\$87
d. Report of initial CMS demonstration	Incl. in C2						
e. Annual report							
i. Results of performance tests conducted during the year	40	1	40	2.0	4.0	46	\$1,744
D. Recordkeeping Requirements							
1. Read instructions	Incl. in C1						
2. Plan activities	N/A						
3. Implement activities	N/A						
4. Develop record system	N/A						
5. Time to enter information							
a. Records of initial performance test	Incl. in C3						
b. Records of annual and any subsequent compliance tests	Incl. in C3						
E. Total Labor Burden and Cost			72	3.6	7.2	83	\$3,139

Notes:

- 56 of the 57 HMIWI will be impacted, and all 56 will need to conduct CMS demonstrations to reestablish their parameter limits. Because the 1 HMIWI not impacted will now have to demonstrate compliance with the PM, CO, and HCl limits on an annual basis, it may need to improve its operation to ensure ongoing compliance and may need to conduct CMS demonstrations to reestablish its parameter limits accordingly.
- 54 of the 57 HMIWI will need to conduct additional tests to demonstrate compliance; the other 3 HMIWI already conduct annual tests for the only pollutants for which they are impacted.
- All 57 HMIWI will need to conduct fugitive ash emissions tests; 54 of the 57 HMIWI will need to conduct both stack tests and fugitive ash tests.
- Industry costs are based on the following hourly rates: technical at \$37.55, management at \$78.76, and clerical at \$21.10 (see table below). The composite hourly labor rate is $(\$37.55/\text{hr}) + (0.05 \times \$78.76/\text{hr}) + (0.1 \times \$21.10/\text{hr}) = \$43.60/\text{hr}$. Labor rates were increased by 60% to account for overhead.
- Person-hours per occurrence for CMS performance specification costs are based on the performance specification costs to certify CMS (\$700) divided by the composite hourly

Table 14. Recordkeeping and Reporting Costs

Burden item	(A) Person-hours per occurrence	(B) Number of occurrences per year	(C) Technical person-hours per year (C = A x B)	(D) Management person-hours per year (D = C x 0.05)	(E) Clerical person-hours per year (E = C x 0.1)	(F) Total person-hours per year (F = C + D + E)	(G) Cost, \$
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labor rate (\$43.60/hr).

6. Control device inspection cost already accounted for under monitoring costs.

7. Assume 8 hours for each facility to review the report of the initial performance test for pollutants and fugitive ash.

8. Assume 2 hours for each facility to review the report of the initial performance test for fugitive ash.

9. For small rural HMIWI, assume 40 hours to review report of annual PM, CO, and HCl compliance reports.

10. The average recurrent burden and cost in the first 3 years after promulgation for the sources with recurrent burden are equal to the person-hours added down each column for technical, management, and clerical and the sum of the cost column.

Sources:

1. Bureau of Labor Statistics, Occupational Employment Statistics, May 2007 National Industry-Specific Occupational Employment and Wage Estimates.

2. Testing and Monitoring Options and Costs Memo (IV-B-66).

Labor Rates:

Parameter	General Medical & Surgical Hospitals	Waste Treatment & Disposal	Colleges, Universities, & Professional Schools	Pharmaceutical & Medicine Manufacturing	Total	Loaded
A. Percentage of industry (excl. U.S. military/gov. research facilities)	58.49%	26.42%	7.55%	7.55%	100.00%	
B. Labor Rates						
1. Technical - Stationary Engineers & Boiler Operators	\$23.80	\$23.31	\$22.01	\$22.94	\$23.47	\$37.55
2. Management - Engineering Managers	\$45.95	\$55.00	\$47.07	\$56.56	\$49.23	\$78.76
3. Clerical - Office Clerks, General	\$13.16	\$12.75	\$12.53	\$15.63	\$13.19	\$21.10
4. Composite labor rate						\$43.60

Table 15. Autoclave/Landfill Costs

Parameters/Costs	Equation	Large	Medium	Small	Small rural
A. Parameters					
1. Incinerator capacity, lb/hr (C)		1,500	500	100	125
2. Annual operating hours, hr/yr (H)		6,000	2,000	4,000	1,500
3. Landfill tip fee (national average), \$/ton		\$34.29	\$34.29	\$34.29	\$34.29
B. Total Capital Investment, \$					
		\$1,000,000	\$450,000	\$350,000	\$350,000
C. Annual Costs, \$/lb					
1. Autoclave		\$0.02	\$0.02	\$0.06	\$0.06
2. Biological indicators test	= [(\$7/test kit) x (12 tests/yr) + (0.5 hr/test) x (12 tests/yr) x (\$20/hr)] / (312 d/yr) / (50,000 lb waste/d)	\$0.000013	\$0.000013	\$0.000013	\$0.000013
3. Inspections	= 2 hr/inspection x 1 inspection/yr x (\$20/hr) / (312 d/yr) / (50,000 lb waste/d)	\$0.000003	\$0.000003	\$0.000003	\$0.000003
4. Permit fee	= (\$500/yr) / (312 hr/yr) / (50,000 lb waste/d)	\$0.00003	\$0.00003	\$0.00003	\$0.00003
5. Total					
a. Without landfill tip fee	= Autoclave + biological indicators test + inspections + permit fee	\$0.02	\$0.02	\$0.06	\$0.06
b. With landfill tip fee	= Autoclave + biological indicators test + inspections + permit fee + (landfill tip fee/2,000 lb/ton)	\$0.03	\$0.04	\$0.07	\$0.07
D. Annual Costs (with landfill tip fee), \$/yr					
	= Total annual cost x (C x 0.67) x H	\$205,273	\$27,758	\$19,497	\$9,139

Notes:

1. Annual autoclave costs include operational costs (chamber liners, labor, capital expense, maintenance, steam, electricity) and hauling costs. Hauling costs from vendor were revised to extract landfill costs, which will be applied to each HMIWI on a regional basis in estimating nationwide costs. National average landfill tip fees used to estimate model costs.
2. The vendor's labor rate and operating time were used in costing the biological indicators test, inspections, and permit fee in order to be consistent with the approach used in the vendor's autoclave costs.

Sources:

1. Autoclave costs and biological indicators test (test kit): San-I-Pak, July 2008.
2. Biological indicators test (labor), inspections, and permit fee: Bay Area Dioxins Project, June 2003.

Table 16. Costs to Haul to Municipal Waste Combustor

Parameters/Costs	Equation	Large	Medium	Small	Small rural
A. Parameters					
1. Incinerator capacity, lb/hr (C)		1,500	500	100	125
2. Annual operating hours, hr/yr (H)		6,000	2,000	4,000	1,500
3. Incinerator tip fee (national average), \$/ton		\$61.64	\$61.64	\$61.64	\$61.64
B. Annual Costs, \$/ton					
1. Without incinerator tip fee	= \$0.266/ton-mile x 50 miles	\$13.30	\$13.30	\$13.30	\$13.30
2. With incinerator tip fee	= \$0.266/ton-mile x 50 miles + incinerator tip fee	\$74.94	\$74.94	\$74.94	\$74.94
C. Annual Costs (with incinerator tip fee), \$/yr	= Total annual cost x (C x 0.67) x H	\$225,944	\$25,105	\$10,042	\$4,707

Note:

National average incinerator tip fee applied to estimate model costs.

Sources:

1. Incinerator tip fee: NSWMA's 2005 Tip Fee Survey.
2. Hauling cost: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics. Table 3-17: Average Freight Revenue Per Ton-mile. Assume 50 mile/trip to reach an MWC.

Table 17. Costs for Commercial Medical Waste Disposal

Parameters/Costs	Large	Medium	Small	Small rural
A. Parameters				
1. Incinerator capacity, lb/hr (C)	1,500	500	100	125
2. Annual operating hours, hr/yr (H)	6,000	2,000	4,000	1,500
B. Annual Costs				
1. \$/lb	\$0.24	\$0.24	\$0.24	\$0.24
2. \$/yr	\$1,447,200	\$160,800	\$64,320	\$30,150

Source:

Commercial disposal fee: Switching Scenarios Memorandum (IV-B-53); cost is in range of recent estimates online (\$0.16/lb for 2006 contract for pickup and disposal of medical waste from sources at University of Kentucky; \$0.35/lb for 2007 pickup and disposal of medical waste from sources at University of Texas at San Antonio; \$0.22-\$0.27/lb for 2004 pickup and disposal of medical waste from hospitals in Maine).

Table 18. Nationwide MACT Floor Costs for Existing Sources

FACID	UNITID	Facility name	Unit number	City	State	Category	New/ existing	APCD code	APCD type	APCD description
1	1	Bristol-Myers Squibb Co.		Wallingford	CT	L	E	FF	Dry	Secondary chamber (1800F) and baghouse
5	5	Merck & Company, Inc.		Rahway	NJ	L	E	DIFF	Dry	Secondary chamber (1500F, 1 sec), partial quench, dry acid gas scrubber with dry lime injection, and baghouse
15	15--1	Curtis Bay Energy	Unit 1	Baltimore	MD	L	E	DIFF	Dry	Secondary chamber, dry scrubber, and baghouse
15	15--2	Curtis Bay Energy	Unit 2	Baltimore	MD	L	E	DIFF	Dry	Secondary chamber, dry scrubber, and baghouse
20	20--1	Fort Detrick	Unit 5	Fort Detrick	MD	L	E	WS	Wet	Secondary chamber and rotary atomizing wet scrubber
20	20--2	Fort Detrick	Unit 6	Fort Detrick	MD	L	E	WS	Wet	Secondary chamber and rotary atomizing wet scrubber
29	29	Hamot Medical Center		Erie	PA	L	E	DIFF/WS	Dry/wet	Secondary chamber (2000F, 2 sec), lime injection system, powdered activated carbon injection system, baghouse, and vertical upflow two-stage multi-microventuri scrubber system
36	36--1	Merck & Company, Inc.	Unit 2	West Point (Upper Gwynedd Township)	PA	L	E	DIFF	Dry	Secondary/tertiary chamber (2000F, 2 sec), water quench followed by sodium bicarbonate injection system with dry reaction chamber and pulse-jet baghouse
36	36--2	Merck & Company, Inc.	Unit 5	West Point (Upper Gwynedd Township)	PA	L	E	DIFF	Dry	Secondary chamber (1800F, 2.2 sec), water quench followed by sodium bicarbonate injection system and pulse-jet baghouse
40	40	Charleston Area Medical Center, General Hospital		Charleston	WV	L	E	DIFF	Dry	Secondary chamber (1800F, 2 sec), dry injection/baghouse scrubber system with activated carbon
42	42	Stericycle, Inc.		Apopka	FL	L	E	DIFF	Dry	Secondary chamber (1800, 1 sec), dry scrubbing system with quench chamber, passive absorber, lime and carbon injection, and baghouse.
43	43	Boca Raton Community Hospital		Boca Raton	FL	L	E	WS	Wet	Secondary chamber (1800F, 1 sec) and rotary atomizing wet scrubber system with caustic soda injection
44	44	Bethesda Memorial Hospital		Boynton Beach	FL	L	E	WS	Wet	Secondary chamber (1800F, 2 sec) and rotary atomizing scrubber with mist eliminator
46	46	Holy Cross Hospital		Fort Lauderdale	FL	L	E	WS	Wet	Secondary chamber (1800F, 1 sec) and venturi scrubber with packed bed absorption unit using dilute NaOH
48	48	Memorial Regional Hospital		Hollywood	FL	L	E	WS/WESP	Wet	Secondary chamber (1800F, 1 sec), packed column gas scrubber, and wet ESP
51	51	Lakeland Regional Medical Center		Lakeland	FL	L	E	DIFF	Dry	Secondary chamber (1800F, 1 sec), lime injection system, and baghouse
54	54	Bayfront Medical Center		St. Petersburg	FL	L	E	WS	Wet	Secondary chamber (1800F, 1 sec) and flux force/condensation collision scrubber system using dilute NaOH
55	55	St. Joseph's Hospital		Tampa	FL	L	E	DIFF/WS	Dry/wet	Secondary chamber (1800F, 1 sec), lime injection, baghouse, and venturi scrubber
59	59--1	Stericycle, Inc.	Unit 1	Haw River	NC	L	E	WS	Wet	Secondary chamber (1800F, 1 sec), rapid gas quench system, wet scrubber system consisting of a packed bed absorber and venturi scrubber, and demister.
59	59--2	Stericycle, Inc.	Unit 2	Haw River	NC	L	E	WS	Wet	Secondary chamber (1800F, 1 sec), rapid gas quench system, wet scrubber system consisting of a packed bed absorber and venturi scrubber, and demister.

Table 18. Nationwide MACT Floor Costs for Existing Sources

FACID	UNITID	Facility name	Unit number	City	State	Category	New/ existing	APCD code	APCD type	APCD description
60	60--1	BMWNC, Inc.	Unit 1	Matthews	NC	L	E	DIFF	Dry	Secondary chamber (1641F), dry scrubber with lime and activated carbon injection, and baghouse
65	65--1	Stericycle, Inc.	Unit 1	Clinton	IL	L	E	WS	Wet	Secondary chamber (1800F), venturi scrubber, and condensing absorber
65	65--2	Stericycle, Inc.	Unit 2	Clinton	IL	L	E	WS	Wet	Secondary chamber (1800F), venturi scrubber, and condensing absorber
71	71	Loyola University Medical Center		Maywood	IL	L	E	WS	Wet	Two secondary chambers (1600F), twin rotary atomizer scrubber using 50% caustic solution, and two demister pads
77	77	Parkview Hospital		Fort Wayne	IN	L	E	WS	Wet	Secondary chamber and wet scrubber
84	84	Mayo Clinic, Waste Management Facility		Rochester	MN	L	E	DIFF	Dry	Secondary chamber (1800F, 1 sec) and baghouse with lime and carbon injection
87	87	MedCentral Health System, Mansfield Hospital		Mansfield	OH	L	E	DIFF	Dry	Secondary chamber (1800F, 2 sec) and baghouse with lime and carbon injection system
94	94	Stericycle, Inc.		Warren	OH	L	E	WS	Wet	Secondary chamber (1800F, 2 sec), wet scrubber
98	98--1	University of Texas Medical Branch		Galveston	TX	L	E	WS	Wet	Secondary chamber, packed tower, and venturi scrubber with activated carbon injection
106	106	Stericycle, Inc.		Kansas City	KS	L	E	WS	Wet	Secondary chamber (1800F, 2 sec), wet scrubber
109	109	Healthcare Environmental Services Inc.		Fargo	ND	L	E	DIFF	Dry	Secondary chamber (1800F) and dry scrubber/baghouse system with lime and carbon injection
110	110	Stericycle, Inc.		North Salt Lake	UT	L	E	DI-ESP/WS	Dry/wet	Secondary chamber (1834F), carbon injection system, ESP, dry scrubber, and wet gas absorber
120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	Anahuac	TX	L	N	DIFF	Dry	Secondary chamber, baghouse with virgin lime injection, urea injection, and activated carbon injection
120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	Anahuac	TX	L	N	DIFF	Dry	Secondary chamber, baghouse with virgin lime injection, urea injection, and activated carbon injection
125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		Greenville	NC	L	N	CA/WS	Dry/wet	Secondary chamber (1985F), rotary atomizing wet scrubber (with NaOH scrubbing medium), carbon bed adsorber, HEPA filtering system, and heat recovery system
130	130	Department of Veterans Affairs Medical Center		Miami	FL	L	E	WS	Wet	Secondary chamber (1800F, 1 sec), venturi scrubber, and packed tower absorber
13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		Baltimore	MD	M	E	WS	Wet	Secondary chamber (1832F) and venturi caustic scrubber with packed-bed scrubber
16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		Baltimore	MD	M	E	WS	Wet	Secondary chamber (1800F) and venturi wet scrubber followed by saturation chamber and mist eliminator
18	18	Franklin Square Hospital Center		Baltimore	MD	M	E	WS	Wet	Secondary chamber (1800F) and venturi scrubber followed by quench chamber and mist eliminator
21	21	Washington County Hospital		Hagerstown	MD	M	E	WS	Wet	Secondary chamber and venturi caustic scrubber
25	25	Holy Spirit Hospital		Camp Hill	PA	M	E	WS	Wet	Secondary chamber (1800F) and venturi scrubber with prequench and NaOH injection
30	30	Riddle Memorial Hospital		Media	PA	M	E	WS	Wet	Secondary chamber (1800F, 2 sec), caustic packed tower scrubber, and high pressure venturi, with activated carbon injection
34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		State College	PA	M	E	WS	Wet	Secondary chamber (1900F) and rotary atomizing wet scrubber with demister
38	38	Wilkes-Barre General Hospital		Wilkes-Barre	PA	M	N	DIFF	Dry	Secondary/tertiary chambers (1800F, 2.85 sec) and dry scrubber/baghouse with lime and activated carbon injection
41	41	Thomas Memorial Hospital		South Charleston	WV	M	E	WS	Wet	Secondary chamber (1800F) and venturi packed tower wet scrubber with caustic injection

Table 18. Nationwide MACT Floor Costs for Existing Sources

FACID	UNITID	Facility name	Unit number	City	State	Category	New/ existing	APCD code	APCD type	APCD description
47	47	Malcolm Randall Veterans Affairs Medical Center		Gainesville	FL	M	E	WS	Wet	Secondary chamber (1800F, 1 sec) and wet scrubber with caustic soda injection
63	63	St. Jude Children's Research Hospital		Memphis	TN	M	E	DIFF	Dry	Secondary chamber (1528F) and baghouse with sodium bicarbonate and carbon injection
81	81	South Bend Medical Foundation		South Bend	IN	M	E	WS	Wet	Secondary chamber and wet scrubber
82	82	Good Samaritan Hospital		Vincennes	IN	M	E	WS	Wet	Secondary chamber and multi-chamber spray scrubber
88	88	Medina General Hospital		Medina	OH	M	E	WS	Wet	Secondary chamber (1800F, 1 sec) and wet scrubber
95	95	St. Joseph's Hospital		Marshfield	WI	M	E	DIFF	Dry	Secondary chamber (1800F), quench tower, and baghouse with lime/carbon injection
108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	Hamilton	MT	M	E	WS	Wet	Secondary chamber and wet scrubber
111	111	Wyoming Medical Center		Casper	WY	M	E	WS	Wet	Secondary chamber and wet scrubber
86	86	Fairfield Medical Center		Lancaster	OH	S	E	WS	Wet	Secondary chamber (1800F, 1 sec) and wet scrubber
129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	Atlanta	GA	S	N	WS	Wet	Secondary chamber (1800F, 1.68 sec) and rotary atomizing wet scrubber
115	115	Kona Community Hospital		Kealahou	HI	SR	E	CC	Comb ctrl	Secondary chamber (1900F, 2 sec), no APCD
116	116	Yukon-Kuskokwim Delta Regional Hospital		Bethel	AK	SR	E	CC	Comb ctrl	Secondary chamber, no APCD
Total large										
Total medium										
Total small										
Total small rural										
Total nationwide										

Note:

Assume incinerators operating at 2/3 of capacity.

Key:

Emissions data unavailable; used average emissions data from similar units (size, APCD) to estimate emissions

Table 18. Nationwide MACT Floor Costs for Existing S

FACID	UNITID	Facility name	Unit number	Maximum charge rate (lb/hr)	Stack gas flow rate (dscfm)	Stack gas temperature (°F)	Operating hours (hr/yr)	Autoclave (\$/lb)	Landfill tip fee region	Landfill tip fee (\$/ton)	Autoclave/landfill cost	HCl unit average (ppmvd)	CO unit average (ppmvd)
1	1	Bristol-Myers Squibb Co.		1,000	1,648	217	2,072	\$0.02	Northeast	\$70.53	\$72,413	65.7	0.983
5	5	Merck & Company, Inc.		799	7,346	246	4,321	\$0.02	Mid-Atlantic	\$46.29	\$92,623	0.780	1.41
15	15--1	Curtis Bay Energy	Unit 1	7,083	27,698	296	8,736	\$0.02	Mid-Atlantic	\$46.29	\$1,660,043	85.2	1.26
15	15--2	Curtis Bay Energy	Unit 2	7,083	30,578	303	8,736	\$0.02	Mid-Atlantic	\$46.29	\$1,660,043	76.9	2.91
20	20--1	Fort Detrick	Unit 5	1,000	2,424	87	1,300	\$0.02	Mid-Atlantic	\$46.29	\$34,876	0.190	0.871
20	20--2	Fort Detrick	Unit 6	1,000	2,308	92	1,300	\$0.02	Mid-Atlantic	\$46.29	\$34,876	0.353	1.17
29	29	Hamot Medical Center		1,060	3,701	122	2,080	\$0.02	Mid-Atlantic	\$46.29	\$59,151	16.6	2.60
36	36--1	Merck & Company, Inc.	Unit 2	2,000	5,235	358	865	\$0.02	Mid-Atlantic	\$46.29	\$46,413	4.22	2.46
36	36--2	Merck & Company, Inc.	Unit 5	3,045	8,119	304	5,753	\$0.02	Mid-Atlantic	\$46.29	\$469,971	3.75	1.07
40	40	Charleston Area Medical Center, General Hospital		1,000	4,323	312	1,248	\$0.02	Mid-Atlantic	\$46.29	\$33,481	26.6	11.3
42	42	Stericycle, Inc.		1,900	7,008	327	7,951	\$0.02	South	\$30.97	\$327,757	27.1	10.7
43	43	Boca Raton Community Hospital		730	2,078	91	8,736	\$0.02	South	\$30.97	\$138,361	0.986	6.46
44	44	Bethesda Memorial Hospital		1,000	4,537	106	3,024	\$0.02	South	\$30.97	\$65,608	0.608	2.74
46	46	Holy Cross Hospital		1,300	3,378	124	2,964	\$0.02	South	\$30.97	\$83,599	1.18	4.91
48	48	Memorial Regional Hospital		1,800	4,568	143	4,992	\$0.02	South	\$30.97	\$194,950	1.02	1.17
51	51	Lakeland Regional Medical Center		750	3,323	212	6,247	\$0.02	South	\$30.97	\$101,651	2.68	6.35
54	54	Bayfront Medical Center		1,500	2,898	133	3,352	\$0.02	South	\$30.97	\$109,087	0.947	9.36
55	55	St. Joseph's Hospital		1,500	3,347	400	8,008	\$0.02	South	\$30.97	\$260,611	12.5	5.85
59	59--1	Stericycle, Inc.	Unit 1	1,911	4,002	135	8,400	\$0.02	South	\$30.97	\$348,271	4.24	3.95
59	59--2	Stericycle, Inc.	Unit 2	1,911	3,917	138	8,400	\$0.02	South	\$30.97	\$348,271	3.88	4.61

Table 18. Nationwide MACT Floor Costs for Existing S

FACID	UNITID	Facility name	Unit number	Maximum charge rate (lb/hr)	Stack gas flow rate (dscfm)	Stack gas temperature (°F)	Operating hours (hr/yr)	Autoclave (\$/lb)	Landfill tip fee region	Landfill tip fee (\$/ton)	Autoclave/landfill cost	HCl unit average (ppmvd)	CO unit average (ppmvd)
60	60--1	BMWNC, Inc.	Unit 1	1,500	6,763	343	7,456	\$0.02	South	\$30.97	\$242,647	38.8	15.1
65	65--1	Stericycle, Inc.	Unit 1	1,500	3,304	143	7,665	\$0.02	Midwest	\$34.96	\$264,808	1.12	12.9
65	65--2	Stericycle, Inc.	Unit 2	1,500	3,125	141	7,558	\$0.02	Midwest	\$34.96	\$261,102	1.43	5.77
71	71	Loyola University Medical Center		1,650	3,526	156	4,800	\$0.02	Midwest	\$34.96	\$182,418	2.22	7.07
77	77	Parkview Hospital		1,200	2,766	114	8,395	\$0.02	Midwest	\$34.96	\$232,030	2.68	5.90
84	84	Mayo Clinic, Waste Management Facility		2,000	6,516	294	6,240	\$0.02	Midwest	\$34.96	\$287,446	15.2	2.24
87	87	MedCentral Health System, Mansfield Hospital		600	2,351	260	3,120	\$0.02	Midwest	\$34.96	\$43,117	24.8	4.81
94	94	Stericycle, Inc.		1,400	2,737	138	7,904	\$0.02	Midwest	\$34.96	\$254,869	0.661	4.45
98	98--1	University of Texas Medical Branch		1,500	4,534	111	5,328	\$0.02	South Central	\$24.06	\$154,893	2.12	1.73
106	106	Stericycle, Inc.		1,500	3,590	152	8,760	\$0.02	West Central	\$24.13	\$254,975	0.567	4.62
109	109	Healthcare Environmental Services Inc.		1,686	4,478	302	1,872	\$0.02	West Central	\$24.13	\$61,244	72.5	14.7
110	110	Stericycle, Inc.		1,935	6,291	126	7,309	\$0.02	West Central	\$24.13	\$274,436	3.93	7.39
120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	4,167	10,031	296	7,896	\$0.02	South Central	\$24.06	\$637,686	11.0	3.96
120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	4,167	9,028	291	7,896	\$0.02	South Central	\$24.06	\$637,686	5.30	2.86
125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		1,000	3,124	125	625	\$0.02	South	\$30.97	\$13,555	1.58	10.7
130	130	Department of Veterans Affairs Medical Center		1,000	6,422	155	4,160	\$0.02	South	\$30.97	\$90,255	8.32	1.00
13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		500	1,972	189	1,440	\$0.02	Mid-Atlantic	\$46.29	\$22,880	0.708	1.50
16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		320	1,890	179	1,350	\$0.02	Mid-Atlantic	\$46.29	\$13,728	1.39	11.8
18	18	Franklin Square Hospital Center		500	2,999	54	5,408	\$0.02	Mid-Atlantic	\$46.29	\$85,927	1.48	5.363
21	21	Washington County Hospital		500	1,834	112	2,496	\$0.02	Mid-Atlantic	\$46.29	\$39,659	6.26	6.62
25	25	Holy Spirit Hospital		500	1,702	99	3,944	\$0.02	Mid-Atlantic	\$46.29	\$62,666	0.736	1.88
30	30	Riddle Memorial Hospital		500	1,730	239	2,920	\$0.02	Mid-Atlantic	\$46.29	\$46,396	2.10	1.41
34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		500	2,117	175	1,022	\$0.02	Mid-Atlantic	\$46.29	\$16,238	1.27	2.11
38	38	Wilkes-Barre General Hospital		400	2,063	274	4,472	\$0.02	Mid-Atlantic	\$46.29	\$56,844	8.95	2.08
41	41	Thomas Memorial Hospital		470	1,526	146	2,080	\$0.02	Mid-Atlantic	\$46.29	\$31,066	2.62	0.946

Table 18. Nationwide MACT Floor Costs for Existing S

FACID	UNITID	Facility name	Unit number	Maximum charge rate (lb/hr)	Stack gas flow rate (dscfm)	Stack gas temperature (°F)	Operating hours (hr/yr)	Autoclave (\$/lb)	Landfill tip fee region	Landfill tip fee (\$/ton)	Autoclave/landfill cost	HCl unit average (ppmvd)	CO unit average (ppmvd)
47	47	Malcolm Randall Veterans Affairs Medical Center		495	1,645	115	1,664	\$0.02	South	\$30.97	\$21,947	4.69	11.6
63	63	St. Jude Children's Research Hospital		500	2,333	276	1,050	\$0.02	South	\$30.97	\$13,989	27.5	0.679
81	81	South Bend Medical Foundation		470	2,325	121	2,028	\$0.02	Midwest	\$34.96	\$26,672	12.3	2.06
82	82	Good Samaritan Hospital		500	1,352	128	2,574	\$0.02	Midwest	\$34.96	\$36,013	1.58	1.91
88	88	Medina General Hospital		300	1,153	100	3,016	\$0.02	Midwest	\$34.96	\$25,318	3.29	14.1
95	95	St. Joseph's Hospital		500	1,634	223	1,404	\$0.02	Midwest	\$34.96	\$19,644	5.27	2.15
108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	500	1,790	112	1,248	\$0.02	West Central	\$24.13	\$15,197	0.455	1.97
111	111	Wyoming Medical Center		400	1,505	130	989	\$0.02	West Central	\$24.13	\$9,635	1.17	3.28
86	86	Fairfield Medical Center		95	1,095	97	5,018	\$0.06	Midwest	\$34.96	\$23,343	1.03	2.27
129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	120	715	163	2,920	\$0.06	South	\$30.97	\$16,690	1.30	12.11
115	115	Kona Community Hospital		200	684	1,787	1,430	\$0.06	West	\$37.74	\$14,271	135	7.00
116	116	Yukon-Kuskokwim Delta Regional Hospital		50	559	1,457	1,560	\$0.06	West	\$37.74	\$3,892	298	5.41
Total large											\$10,035,221		
Total medium											\$543,819		
Total small											\$40,033		
Total small rural											\$18,163		
Total nationwide											\$10,637,237		

Note:
Assume incinerators operating at 2/3 of capacity.

Key:
Emissions data unavailable; used average emissions data from similar units

Table 18. Nationwide MACT Floor Costs for Existing S

FACID	UNITID	Facility name	Unit number	Pb unit average (mg/dscm)	Cd unit average (mg/dscm)	Hg unit average (mg/dscm)	PM unit average (gr/dscf)	CDD/CDF unit average (ng/dscm)	TEQ unit average (ng/dscm)	NO _x unit average (ppmvd)	SO ₂ unit average (ppmvd)	MACT floor HCl limit (ppmvd)	MACT floor CO limit (ppmvd)	MACT floor Pb limit (mg/dscm)
1	1	Bristol-Myers Squibb Co.		0.319	0.00364	0.000695	0.00180	36.9	0.659	119	29.9	2.4	3.9	0.013
5	5	Merck & Company, Inc.		0.0155	0.00265	0.00353	0.00330	12.8	0.110	112	2.72	2.4	3.9	0.013
15	15--1	Curtis Bay Energy	Unit 1	0.00504	0.000887	0.174	0.00823	27.7	0.451	187	23.0	2.4	3.9	0.013
15	15--2	Curtis Bay Energy	Unit 2	0.00769	0.00130	0.300	0.00407	5.47	0.115	180	34.7	2.4	3.9	0.013
20	20--1	Fort Detrick	Unit 5	0.126	0.00992	0.00324	0.00721	85.2	0.762	121	2.85	2.4	3.9	0.013
20	20--2	Fort Detrick	Unit 6	0.182	0.00867	0.00771	0.00775	97.3	1.26	121	2.85	2.4	3.9	0.013
29	29	Hamot Medical Center		0.00675	0.00119	0.00400	0.00174	7.72	0.0879	131	2.78	2.4	3.9	0.013
36	36--1	Merck & Company, Inc.	Unit 2	0.00115	0.000853	0.00305	0.00156	3.71	0.0442	99.8	1.13	2.4	3.9	0.013
36	36--2	Merck & Company, Inc.	Unit 5	0.0109	0.00242	0.0141	0.00255	6.78	0.308	94.4	2.35	2.4	3.9	0.013
40	40	Charleston Area Medical Center, General Hospital		0.00468	0.00186	0.00418	0.00106	1.31	0.0153	92.7	2.07	2.4	3.9	0.013
42	42	Stericycle, Inc.		0.0434	0.00886	0.0132	0.00203	24.3	0.748	149	1.50	2.4	3.9	0.013
43	43	Boca Raton Community Hospital		0.0883	0.00537	0.0119	0.0104	67.7	0.852	121	2.85	2.4	3.9	0.013
44	44	Bethesda Memorial Hospital		0.0774	0.00929	0.0739	0.00960	54.3	1.21	88.3	4.62	2.4	3.9	0.013
46	46	Holy Cross Hospital		0.0618	0.0168	0.0504	0.0103	37.5	2.23	67.9	1.16	2.4	3.9	0.013
48	48	Memorial Regional Hospital		0.0928	0.00560	0.00374	0.00973	48.3	1.29	142	3.41	2.4	3.9	0.013
51	51	Lakeland Regional Medical Center		0.0348	0.00365	0.00244	0.00254	68.2	1.29	77.1	2.13	2.4	3.9	0.013
54	54	Bayfront Medical Center		0.0976	0.00379	0.00128	0.00543	46.6	0.819	140	1.25	2.4	3.9	0.013
55	55	St. Joseph's Hospital		0.0740	0.00205	0.00730	0.00111	66.2	1.35	123	2.52	2.4	3.9	0.013
59	59--1	Stericycle, Inc.	Unit 1	0.206	0.0233	0.0389	0.00714	2.82	0.0664	121	2.85	2.4	3.9	0.013
59	59--2	Stericycle, Inc.	Unit 2	0.206	0.0188	0.118	0.0102	5.48	0.0845	121	2.85	2.4	3.9	0.013

Table 18. Nationwide MACT Floor Costs for Existing S

FACID	UNITID	Facility name	Unit number	Pb unit average (mg/dscm)	Cd unit average (mg/dscm)	Hg unit average (mg/dscm)	PM unit average (gr/dscf)	CDD/CDF unit average (ng/dscm)	TEQ unit average (ng/dscm)	NO _x unit average (ppmvd)	SO ₂ unit average (ppmvd)	MACT floor HCl limit (ppmvd)	MACT floor CO limit (ppmvd)	MACT floor Pb limit (mg/dscm)
60	60--1	BMWNC, Inc.	Unit 1	0.00335	0.000532	0.0598	0.00504	6.10	0.149	104	7.03	2.4	3.9	0.013
65	65--1	Stericycle, Inc.	Unit 1	0.200	0.00572	0.415	0.00921	1.24	0.0105	121	2.85	2.4	3.9	0.013
65	65--2	Stericycle, Inc.	Unit 2	0.134	0.0123	0.377	0.00878	0.837	0.0126	121	2.85	2.4	3.9	0.013
71	71	Loyola University Medical Center		0.178	0.0152	0.0183	0.0105	67.9	0.630	107	0.819	2.4	3.9	0.013
77	77	Parkview Hospital		0.177	0.0802	0.00623	0.0109	7.10	0.0898	121	2.85	2.4	3.9	0.013
84	84	Mayo Clinic, Waste Management Facility		0.291	0.0101	0.0445	0.0137	0.357	0.0117	176	1.45	2.4	3.9	0.013
87	87	MedCentral Health System, Mansfield Hospital		0.0415	0.00113	0.00898	0.00357	29.8	0.560	121	9.27	2.4	3.9	0.013
94	94	Stericycle, Inc.		0.244	0.00524	0.239	0.00617	14.7	0.341	121	2.85	2.4	3.9	0.013
98	98--1	University of Texas Medical Branch		0.756	0.00298	0.0482	0.0147	98.1	1.06	78.9	1.12	2.4	3.9	0.013
106	106	Stericycle, Inc.		0.127	0.00396	0.375	0.00828	2.40	0.0176	121	2.85	2.4	3.9	0.013
109	109	Healthcare Environmental Services Inc.		0.0171	0.00296	0.129	0.00611	16.0	1.95	207	20.2	2.4	3.9	0.013
110	110	Stericycle, Inc.		0.0309	0.00214	0.0746	0.00449	3.37	0.0824	228	3.35	2.4	3.9	0.013
120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	0.0187	0.00132	0.0130	0.00702	0.498	0.00807	72.4	1.21	2.4	3.9	0.013
120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	0.00778	0.000889	0.00559	0.00947	0.152	0.00378	88.4	0.462	2.4	3.9	0.013
125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		0.000296	0.000106	0.00164	0.00323	0.380	0.00532	66.9	1.45	2.4	3.9	0.013
130	130	Department of Veterans Affairs Medical Center		0.0435	0.00564	0.00542	0.0111	0.665	0.0160	81.5	7.58	2.4	3.9	0.013
13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		0.973	0.122	0.0405	0.0126	1.06	0.0509	99.8	0.469	2.5	3	0.017
16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		0.331	0.0472	0.00395	0.0294	6.98	0.151	87.9	2.88	2.5	3	0.017
18	18	Franklin Square Hospital Center		0.262	0.0474	0.00270	0.0256	91.4	0.996	84.7	10.9	2.5	3	0.017
21	21	Washington County Hospital		0.164	0.0139	0.000836	0.0197	76.2	1.32	105	3.52	2.5	3	0.017
25	25	Holy Spirit Hospital		0.155	0.0439	0.00346	0.0164	3.47	0.0299	105	3.52	2.5	3	0.017
30	30	Riddle Memorial Hospital		0.178	0.00366	0.0108	0.0124	78.2	1.42	124	0.336	2.5	3	0.017
34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		0.151	0.00408	0.00124	0.0239	0.0973	0.00291	105	1.22	2.5	3	0.017
38	38	Wilkes-Barre General Hospital		0.00406	0.00106	0.00927	0.00399	16.3	0.193	105	1.90	2.5	3	0.017
41	41	Thomas Memorial Hospital		0.723	0.0297	0.109	0.0261	0.175	0.00424	94.4	2.46	2.5	3	0.017

Table 18. Nationwide MACT Floor Costs for Existing S

FACID	UNITID	Facility name	Unit number	Pb unit average (mg/dscm)	Cd unit average (mg/dscm)	Hg unit average (mg/dscm)	PM unit average (gr/dscf)	CDD/CDF unit average (ng/dscm)	TEQ unit average (ng/dscm)	NO _x unit average (ppmvd)	SO ₂ unit average (ppmvd)	MACT floor HCl limit (ppmvd)	MACT floor CO limit (ppmvd)	MACT floor Pb limit (mg/dscm)
47	47	Malcolm Randall Veterans Affairs Medical Center		0.227	0.0877	0.0195	0.0173	4.48	0.111	148	2.54	2.5	3	0.017
63	63	St. Jude Children's Research Hospital		0.00485	0.00152	0.00361	0.00505	9.11	0.160	131	2.02	2.5	3	0.017
81	81	South Bend Medical Foundation		0.539	0.00176	0.206	0.01159	4.10	0.0409	15.0	11.7	2.5	3	0.017
82	82	Good Samaritan Hospital		0.0261	0.00336	0.00251	0.0137	27.9	0.0967	105	3.52	2.5	3	0.017
88	88	Medina General Hospital		0.669	0.0109	0.00716	0.0267	17.2	0.458	105	3.52	2.5	3	0.017
95	95	St. Joseph's Hospital		0.00397	0.00128	0.00254	0.00294	1.28	0.0457	105	1.96	2.5	3	0.017
108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	0.0996	0.00773	0.00312	0.0216	0.206	0.00300	128	0.932	2.5	3	0.017
111	111	Wyoming Medical Center		0.0496	0.0182	0.0237	0.00336	74.0	1.12	141	1.80	2.5	3	0.017
86	86	Fairfield Medical Center		0.161	0.00256	0.0114	0.0137	2.89	0.0624	105	3.52	4.5	8.2	0.18
129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	0.0727	0.00545	0.00292	0.00760	2.89	0.00453	105	3.52	4.5	8.2	0.18
115	115	Kona Community Hospital		0.226	0.0380	0.00158	0.0128	29.6	0.618	95	3.52	440	12	0.35
116	116	Yukon-Kuskokwim Delta Regional Hospital		0.226	0.0380	0.0906	0.0162	125	2.52	95.1	22.6	440	12	0.35
Total large														
Total medium														
Total small														
Total small rural														
Total nationwide														

Note:
Assume incinerators operating at 2/3 of capacity.

Key:
Emissions data unavailable; used average emissions data from similar units

Table 18. Nationwide MACT Floor Costs for Existing S

FACID	UNITID	Facility name	Unit number	MACT floor Cd limit (mg/dscm)	MACT floor Hg limit (mg/dscm)	MACT floor PM limit (gr/dscf)	MACT floor CDD/CDF limit (ng/dscm)	MACT floor TEQ limit (ng/dscm)	MACT floor NO _x limit (ppmvd)	MACT floor SO ₂ limit (ppmvd)	Meets HCl Limit	Meets CO Limit	Meets Pb Limit	Meets Cd Limit
1	1	Bristol-Myers Squibb Co.		0.0041	0.0095	0.0056	1.6	0.029	140	2.8	1	0	1	0
5	5	Merck & Company, Inc.		0.0041	0.0095	0.0056	1.6	0.029	140	2.8	0	0	1	0
15	15--1	Curtis Bay Energy	Unit 1	0.0041	0.0095	0.0056	1.6	0.029	140	2.8	1	0	0	0
15	15--2	Curtis Bay Energy	Unit 2	0.0041	0.0095	0.0056	1.6	0.029	140	2.8	1	0	0	0
20	20--1	Fort Detrick	Unit 5	0.0041	0.0095	0.0056	1.6	0.029	140	2.8	0	0	1	1
20	20--2	Fort Detrick	Unit 6	0.0041	0.0095	0.0056	1.6	0.029	140	2.8	0	0	1	1
29	29	Hamot Medical Center		0.0041	0.0095	0.0056	1.6	0.029	140	2.8	1	0	0	0
36	36--1	Merck & Company, Inc.	Unit 2	0.0041	0.0095	0.0056	1.6	0.029	140	2.8	1	0	0	0
36	36--2	Merck & Company, Inc.	Unit 5	0.0041	0.0095	0.0056	1.6	0.029	140	2.8	1	0	0	0
40	40	Charleston Area Medical Center, General Hospital		0.0041	0.0095	0.0056	1.6	0.029	140	2.8	1	1	0	0
42	42	Stericycle, Inc.		0.0041	0.0095	0.0056	1.6	0.029	140	2.8	1	1	1	1
43	43	Boca Raton Community Hospital		0.0041	0.0095	0.0056	1.6	0.029	140	2.8	0	1	1	1
44	44	Bethesda Memorial Hospital		0.0041	0.0095	0.0056	1.6	0.029	140	2.8	0	0	1	1
46	46	Holy Cross Hospital		0.0041	0.0095	0.0056	1.6	0.029	140	2.8	0	1	1	1
48	48	Memorial Regional Hospital		0.0041	0.0095	0.0056	1.6	0.029	140	2.8	0	0	1	1
51	51	Lakeland Regional Medical Center		0.0041	0.0095	0.0056	1.6	0.029	140	2.8	1	1	1	0
54	54	Bayfront Medical Center		0.0041	0.0095	0.0056	1.6	0.029	140	2.8	0	1	1	0
55	55	St. Joseph's Hospital		0.0041	0.0095	0.0056	1.6	0.029	140	2.8	1	1	1	0
59	59--1	Stericycle, Inc.	Unit 1	0.0041	0.0095	0.0056	1.6	0.029	140	2.8	1	1	1	1
59	59--2	Stericycle, Inc.	Unit 2	0.0041	0.0095	0.0056	1.6	0.029	140	2.8	1	1	1	1

Table 18. Nationwide MACT Floor Costs for Existing S

FACID	UNITID	Facility name	Unit number	MACT floor Cd limit (mg/dscm)	MACT floor Hg limit (mg/dscm)	MACT floor PM limit (gr/dscf)	MACT floor CDD/CDF limit (ng/dscm)	MACT floor TEQ limit (ng/dscm)	MACT floor NO _x limit (ppmvd)	MACT floor SO ₂ limit (ppmvd)	Meets HCl Limit	Meets CO Limit	Meets Pb Limit	Meets Cd Limit
60	60--1	BMWNC, Inc.	Unit 1	0.0041	0.0095	0.0056	1.6	0.029	140	2.8	1	1	0	0
65	65--1	Stericycle, Inc.	Unit 1	0.0041	0.0095	0.0056	1.6	0.029	140	2.8	0	1	1	1
65	65--2	Stericycle, Inc.	Unit 2	0.0041	0.0095	0.0056	1.6	0.029	140	2.8	0	1	1	1
71	71	Loyola University Medical Center		0.0041	0.0095	0.0056	1.6	0.029	140	2.8	0	1	1	1
77	77	Parkview Hospital		0.0041	0.0095	0.0056	1.6	0.029	140	2.8	1	1	1	1
84	84	Mayo Clinic, Waste Management Facility		0.0041	0.0095	0.0056	1.6	0.029	140	2.8	1	0	1	1
87	87	MedCentral Health System, Mansfield Hospital		0.0041	0.0095	0.0056	1.6	0.029	140	2.8	1	1	1	0
94	94	Stericycle, Inc.		0.0041	0.0095	0.0056	1.6	0.029	140	2.8	0	1	1	1
98	98--1	University of Texas Medical Branch		0.0041	0.0095	0.0056	1.6	0.029	140	2.8	0	0	1	0
106	106	Stericycle, Inc.		0.0041	0.0095	0.0056	1.6	0.029	140	2.8	0	1	1	0
109	109	Healthcare Environmental Services Inc.		0.0041	0.0095	0.0056	1.6	0.029	140	2.8	1	1	1	0
110	110	Stericycle, Inc.		0.0041	0.0095	0.0056	1.6	0.029	140	2.8	1	1	1	0
120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	0.0041	0.0095	0.0056	1.6	0.029	140	2.8	1	1	1	0
120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	0.0041	0.0095	0.0056	1.6	0.029	140	2.8	1	0	0	0
125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		0.0041	0.0095	0.0056	1.6	0.029	140	2.8	0	1	0	0
130	130	Department of Veterans Affairs Medical Center		0.0041	0.0095	0.0056	1.6	0.029	140	2.8	1	0	1	1
13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		0.0071	0.0079	0.012	0.63	0.0097	200	2.8	0	0	1	1
16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		0.0071	0.0079	0.012	0.63	0.0097	200	2.8	0	1	1	1
18	18	Franklin Square Hospital Center		0.0071	0.0079	0.012	0.63	0.0097	200	2.8	0	1	1	1
21	21	Washington County Hospital		0.0071	0.0079	0.012	0.63	0.0097	200	2.8	1	1	1	1
25	25	Holy Spirit Hospital		0.0071	0.0079	0.012	0.63	0.0097	200	2.8	0	0	1	1
30	30	Riddle Memorial Hospital		0.0071	0.0079	0.012	0.63	0.0097	200	2.8	0	0	1	0
34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		0.0071	0.0079	0.012	0.63	0.0097	200	2.8	0	0	1	0
38	38	Wilkes-Barre General Hospital		0.0071	0.0079	0.012	0.63	0.0097	200	2.8	1	0	0	0
41	41	Thomas Memorial Hospital		0.0071	0.0079	0.012	0.63	0.0097	200	2.8	1	0	1	1

Table 18. Nationwide MACT Floor Costs for Existing S

FACID	UNITID	Facility name	Unit number	MACT floor Cd limit (mg/dscm)	MACT floor Hg limit (mg/dscm)	MACT floor PM limit (gr/dscf)	MACT floor CDD/CDF limit (ng/dscm)	MACT floor TEQ limit (ng/dscm)	MACT floor NO _x limit (ppmvd)	MACT floor SO ₂ limit (ppmvd)	Meets HCl Limit	Meets CO Limit	Meets Pb Limit	Meets Cd Limit
47	47	Malcolm Randall Veterans Affairs Medical Center		0.0071	0.0079	0.012	0.63	0.0097	200	2.8	1	1	1	1
63	63	St. Jude Children's Research Hospital		0.0071	0.0079	0.012	0.63	0.0097	200	2.8	1	0	0	0
81	81	South Bend Medical Foundation		0.0071	0.0079	0.012	0.63	0.0097	200	2.8	1	0	1	0
82	82	Good Samaritan Hospital		0.0071	0.0079	0.012	0.63	0.0097	200	2.8	0	0	1	0
88	88	Medina General Hospital		0.0071	0.0079	0.012	0.63	0.0097	200	2.8	1	1	1	1
95	95	St. Joseph's Hospital		0.0071	0.0079	0.012	0.63	0.0097	200	2.8	1	0	0	0
108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	0.0071	0.0079	0.012	0.63	0.0097	200	2.8	0	0	1	1
111	111	Wyoming Medical Center		0.0071	0.0079	0.012	0.63	0.0097	200	2.8	0	1	1	1
86	86	Fairfield Medical Center		0.012	0.0075	0.017	8.3	0.008	200	2.8	0	0	0	0
129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	0.012	0.0075	0.017	8.3	0.008	200	2.8	0	1	0	0
115	115	Kona Community Hospital		0.068	0.004	0.03	130	2.6	110	43	0	0	0	0
116	116	Yukon-Kuskokwim Delta Regional Hospital		0.068	0.004	0.03	130	2.6	110	43	0	0	0	0
Total large														
Total medium														
Total small														
Total small rural														
Total nationwide														

Note:
Assume incinerators operating at 2/3 of capacity.

Key:
Emissions data unavailable; used average emissions data from similar units

Table 18. Nationwide MACT Floor Costs for Existing S

FACID	UNITID	Facility name	Unit number	Meets Hg Limit	Meets PM Limit	Meets Total CDD/CDF Limit	Meets CDD/CDF TEQ Limit	Meets CDD/CDF Limit (Total or TEQ)	Meets NO _x Limit	Meets SO ₂ Limit	HCl % Improvement Needed	MACT floor HCl control	CO % Improvement Needed	MACT floor CO control
1	1	Bristol-Myers Squibb Co.		0	0	1	1	1	0	1	2636%	add packed-bed scrubber	-75%	none
5	5	Merck & Company, Inc.		0	0	1	1	1	0	0	-67%	none	-64%	none
15	15--1	Curtis Bay Energy	Unit 1	1	1	1	1	1	1	1	3450%	add packed-bed scrubber	-68%	none
15	15--2	Curtis Bay Energy	Unit 2	1	0	1	1	1	1	1	3104%	add packed-bed scrubber	-25%	none
20	20--1	Fort Detrick	Unit 5	0	1	1	1	1	0	1	-92%	none	-78%	none
20	20--2	Fort Detrick	Unit 6	0	1	1	1	1	0	1	-85%	none	-70%	none
29	29	Hamot Medical Center		0	0	1	1	1	0	0	592%	add packed-bed scrubber	-33%	none
36	36--1	Merck & Company, Inc.	Unit 2	0	0	1	1	1	0	0	76%	add packed-bed scrubber	-37%	none
36	36--2	Merck & Company, Inc.	Unit 5	1	0	1	1	1	0	0	56%	add packed-bed scrubber	-73%	none
40	40	Charleston Area Medical Center, General Hospital		0	0	0	0	0	0	0	1010%	add packed-bed scrubber	190%	increase natural gas
42	42	Stericycle, Inc.		1	0	1	1	1	1	0	1031%	add packed-bed scrubber	175%	secondary chamber retrofit
43	43	Boca Raton Community Hospital		1	1	1	1	1	0	1	-59%	none	66%	secondary chamber retrofit
44	44	Bethesda Memorial Hospital		1	1	1	1	1	0	1	-75%	none	-30%	none
46	46	Holy Cross Hospital		1	1	1	1	1	0	0	-51%	none	26%	increase natural gas
48	48	Memorial Regional Hospital		0	1	1	1	1	1	1	-58%	none	-70%	none
51	51	Lakeland Regional Medical Center		0	0	1	1	1	0	0	12%	increase lime	63%	secondary chamber retrofit
54	54	Bayfront Medical Center		0	0	1	1	1	1	0	-61%	none	140%	secondary chamber retrofit
55	55	St. Joseph's Hospital		0	0	1	1	1	0	0	422%	add packed-bed scrubber	50%	increase natural gas
59	59--1	Stericycle, Inc.	Unit 1	1	1	1	1	1	0	1	76%	add caustic	1.2%	increase natural gas
59	59--2	Stericycle, Inc.	Unit 2	1	1	1	1	1	0	1	62%	add caustic	18%	increase natural gas

Table 18. Nationwide MACT Floor Costs for Existing S

FACID	UNITID	Facility name	Unit number	Meets Hg Limit	Meets PM Limit	Meets Total CDD/CDF Limit	Meets CDD/CDF TEQ Limit	Meets CDD/CDF Limit (Total or TEQ)	Meets NO _x Limit	Meets SO ₂ Limit	HCl % Improvement Needed	MACT floor HCl control	CO % Improvement Needed	MACT floor CO control
60	60--1	BMWNC, Inc.	Unit 1	1	0	1	1	1	0	1	1516%	add packed-bed scrubber	287%	secondary chamber retrofit
65	65--1	Stericycle, Inc.	Unit 1	1	1	0	0	0	0	1	-53%	none	231%	secondary chamber retrofit
65	65--2	Stericycle, Inc.	Unit 2	1	1	0	0	0	0	1	-40%	none	48%	increase natural gas
71	71	Loyola University Medical Center		1	1	1	1	1	0	0	-7.6%	none	81%	secondary chamber retrofit
77	77	Parkview Hospital		0	1	1	1	1	0	1	12%	increase caustic	51%	increase natural gas
84	84	Mayo Clinic, Waste Management Facility		1	1	0	0	0	1	0	535%	add packed-bed scrubber	-42%	none
87	87	MedCentral Health System, Mansfield Hospital		0	0	1	1	1	0	1	934%	add packed-bed scrubber	23%	increase natural gas
94	94	Stericycle, Inc.		1	1	1	1	1	0	1	-72%	none	14%	increase natural gas
98	98--1	University of Texas Medical Branch		1	1	1	1	1	0	0	-11%	none	-56%	none
106	106	Stericycle, Inc.		1	1	1	0	0	0	1	-76%	none	18%	increase natural gas
109	109	Healthcare Environmental Services Inc.		1	1	1	1	1	1	1	2919%	add packed-bed scrubber	278%	secondary chamber retrofit
110	110	Stericycle, Inc.		1	0	1	1	1	1	1	64%	increase sodium bicarbonate	89%	secondary chamber retrofit
120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	1	1	0	0	0	0	0	360%	add packed-bed scrubber	1.6%	increase natural gas
120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	0	1	0	0	0	0	0	121%	add packed-bed scrubber	-27%	none
125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		0	0	0	0	0	0	0	-34%	none	173%	secondary chamber retrofit
130	130	Department of Veterans Affairs Medical Center		0	1	0	0	0	0	1	247%	add caustic	-74%	none
13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		1	1	1	1	1	0	0	-72%	none	-50%	none
16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		0	1	1	1	1	0	1	-45%	none	293%	secondary chamber retrofit
18	18	Franklin Square Hospital Center		0	1	1	1	1	0	1	-41%	none	79%	secondary chamber retrofit
21	21	Washington County Hospital		0	1	1	1	1	0	1	150%	add packed-bed scrubber	121%	secondary chamber retrofit
25	25	Holy Spirit Hospital		0	1	1	1	1	0	1	-71%	none	-37%	none
30	30	Riddle Memorial Hospital		1	1	1	1	1	0	0	-16%	none	-53%	none
34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		0	1	0	0	0	0	0	-49%	none	-30%	none
38	38	Wilkes-Barre General Hospital		1	0	1	1	1	0	0	258%	add packed-bed scrubber	-31%	none
41	41	Thomas Memorial Hospital		1	1	0	0	0	0	0	5.0%	add caustic	-68%	none

Table 18. Nationwide MACT Floor Costs for Existing S

FACID	UNITID	Facility name	Unit number	Meets Hg Limit	Meets PM Limit	Meets Total CDD/CDF Limit	Meets CDD/CDF TEQ Limit	Meets CDD/CDF Limit (Total or TEQ)	Meets NO _x Limit	Meets SO ₂ Limit	HCl % Improvement Needed	MACT floor HCl control	CO % Improvement Needed	MACT floor CO control
47	47	Malcolm Randall Veterans Affairs Medical Center		1	1	1	1	1	0	0	88%	add packed-bed scrubber	286%	secondary chamber retrofit
63	63	St. Jude Children's Research Hospital		0	0	1	1	1	0	0	1002%	add packed-bed scrubber	-77%	none
81	81	South Bend Medical Foundation		1	0	1	1	1	0	1	392%	add packed-bed scrubber	-31%	none
82	82	Good Samaritan Hospital		0	1	1	1	1	0	1	-37%	none	-36%	none
88	88	Medina General Hospital		0	1	1	1	1	0	1	32%	add caustic	369%	secondary chamber retrofit
95	95	St. Joseph's Hospital		0	0	1	1	1	0	0	111%	add packed-bed scrubber	-28%	none
108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	0	1	0	0	0	0	0	-82%	none	-34%	none
111	111	Wyoming Medical Center		1	0	1	1	1	0	0	-53%	none	9.3%	increase natural gas
86	86	Fairfield Medical Center		1	0	0	1	0	0	1	-77%	none	-72%	none
129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	0	0	0	0	0	0	1	-71%	none	48%	secondary chamber retrofit
115	115	Kona Community Hospital		0	0	0	0	0	0	0	-69%	none	-42%	none
116	116	Yukon-Kuskokwim Delta Regional Hospital		1	0	0	0	0	0	0	-32%	none	-55%	none
Total large														
Total medium														
Total small														
Total small rural														
Total nationwide														

Note:
Assume incinerators operating at 2/3 of capacity.

Key:
Emissions data unavailable; used average emissions data from similar units

Table 18. Nationwide MACT Floor Costs for Existing S

FACID	UNITID	Facility name	Unit number	Pb % Improvement Needed	MACT floor Pb control	Cd % Improvement Needed	MACT floor Cd control	Hg % Improvement Needed	MACT floor Hg control	PM % Improvement Needed	MACT floor PM control	Total CDD/CDF % Improvement Needed
1	1	Bristol-Myers Squibb Co.		2352%	replace FF	-11%	none	-93%	none	-68%	none	2204%
5	5	Merck & Company, Inc.		19%	improve FF performance	-35%	none	-63%	none	-41%	none	701%
15	15--1	Curtis Bay Energy	Unit 1	-61%	none	-78%	none	1735%	add ACI	47%	improve FF performance	1629%
15	15--2	Curtis Bay Energy	Unit 2	-41%	none	-68%	none	3059%	add ACI	-27%	none	242%
20	20--1	Fort Detrick	Unit 5	872%	add FF	142%	add FF	-66%	none	29%	add FF	5223%
20	20--2	Fort Detrick	Unit 6	1301%	add FF	111%	add FF	-19%	none	38%	add FF	5981%
29	29	Hamot Medical Center		-48%	none	-71%	none	-58%	none	-69%	none	383%
36	36--1	Merck & Company, Inc.	Unit 2	-91%	none	-79%	none	-68%	none	-72%	none	132%
36	36--2	Merck & Company, Inc.	Unit 5	-16%	none	-41%	none	49%	add ACI	-54%	none	324%
40	40	Charleston Area Medical Center, General Hospital		-64%	none	-55%	none	-56%	none	-81%	none	-18%
42	42	Stericycle, Inc.		234%	replace FF	116%	replace FF	39%	increase activated carbon	-64%	none	1417%
43	43	Boca Raton Community Hospital		579%	add FF	31%	add FF	25%	add ACI	86%	add FF	4133%
44	44	Bethesda Memorial Hospital		495%	add FF	127%	add FF	678%	add ACI	71%	add FF	3292%
46	46	Holy Cross Hospital		375%	add FF	310%	add FF	430%	add ACI	84%	add FF	2246%
48	48	Memorial Regional Hospital		614%	add FF	37%	increase pressure drop	-61%	none	74%	add FF	2922%
51	51	Lakeland Regional Medical Center		168%	replace FF	-11%	none	-74%	none	-55%	none	4163%
54	54	Bayfront Medical Center		651%	add FF	-7.4%	none	-87%	none	-3.0%	none	2810%
55	55	St. Joseph's Hospital		469%	replace FF	-50%	none	-23%	none	-80%	none	4035%
59	59--1	Stericycle, Inc.	Unit 1	1482%	add FF	468%	add FF	309%	add ACI	27%	add FF	76%
59	59--2	Stericycle, Inc.	Unit 2	1483%	add FF	359%	add FF	1141%	add ACI	82%	add FF	243%

Table 18. Nationwide MACT Floor Costs for Existing S

FACID	UNITID	Facility name	Unit number	Pb % Improvement Needed	MACT floor Pb control	Cd % Improvement Needed	MACT floor Cd control	Hg % Improvement Needed	MACT floor Hg control	PM % Improvement Needed	MACT floor PM control	Total CDD/CDF % Improvement Needed
60	60--1	BMWNC, Inc.	Unit 1	-74%	none	-87%	none	529%	increase activated carbon	-10%	none	281%
65	65--1	Stericycle, Inc.	Unit 1	1442%	add FF	39%	add FF	4265%	add ACI	65%	add FF	-23%
65	65--2	Stericycle, Inc.	Unit 2	934%	add FF	200%	add FF	3866%	add ACI	57%	add FF	-48%
71	71	Loyola University Medical Center		1266%	add FF	272%	add FF	93%	add ACI	87%	add FF	4144%
77	77	Parkview Hospital		1264%	add FF	1855%	add FF	-34%	none	95%	add FF	344%
84	84	Mayo Clinic, Waste Management Facility		2137%	replace FF	146%	replace FF	368%	increase activated carbon	144%	replace FF	-78%
87	87	MedCentral Health System, Mansfield Hospital		219%	replace FF	-72%	none	-5.5%	none	-36%	none	1763%
94	94	Stericycle, Inc.		1776%	add FF	28%	add FF	2419%	add ACI	10%	increase pressure drop	821%
98	98--1	University of Texas Medical Branch		5714%	add FF	-27%	none	407%	increase activated carbon	163%	add FF	6034%
106	106	Stericycle, Inc.		876%	add FF	-3.4%	none	3852%	add ACI	48%	add FF	50%
109	109	Healthcare Environmental Services Inc.		31%	replace FF	-28%	none	1255%	increase activated carbon	9.1%	improve FF performance	900%
110	110	Stericycle, Inc.		137%	add FF	-48%	none	686%	increase activated carbon	-20%	none	110%
120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	44%	replace FF	-68%	none	37%	increase activated carbon	25%	replace FF	-69%
120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	-40%	none	-78%	none	-41%	none	69%	replace FF	-91%
125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		-98%	none	-97%	none	-83%	none	-42%	none	-76%
130	130	Department of Veterans Affairs Medical Center		234%	add FF	38%	add FF	-43%	none	98%	add FF	-58%
13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		5622%	add FF	1622%	add FF	413%	add ACI	5.1%	increase pressure drop	68%
16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		1846%	add FF	565%	add FF	-50%	none	145%	add FF	1008%
18	18	Franklin Square Hospital Center		1441%	add FF	568%	add FF	-66%	none	113%	add FF	14401%
21	21	Washington County Hospital		863%	add FF	95%	add FF	-89%	none	64%	add FF	11994%
25	25	Holy Spirit Hospital		812%	add FF	518%	add FF	-56%	none	37%	add FF	451%
30	30	Riddle Memorial Hospital		948%	add FF	-48%	none	36%	increase activated carbon	3.4%	increase pressure drop	12319%
34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		786%	add FF	-43%	none	-84%	none	99%	add FF	-85%
38	38	Wilkes-Barre General Hospital		-76%	none	-85%	none	17%	increase activated carbon	-67%	none	2487%
41	41	Thomas Memorial Hospital		4154%	add FF	319%	add FF	1277%	add ACI	118%	add FF	-72%

Table 18. Nationwide MACT Floor Costs for Existing S

FACID	UNITID	Facility name	Unit number	Pb % Improvement Needed	MACT floor Pb control	Cd % Improvement Needed	MACT floor Cd control	Hg % Improvement Needed	MACT floor Hg control	PM % Improvement Needed	MACT floor PM control	Total CDD/CDF % Improvement Needed
47	47	Malcolm Randall Veterans Affairs Medical Center		1237%	add FF	1136%	add FF	147%	add ACI	44%	add FF	612%
63	63	St. Jude Children's Research Hospital		-71%	none	-79%	none	-54%	none	-58%	none	1346%
81	81	South Bend Medical Foundation		3069%	add FF	-75%	none	2511%	add ACI	-3.5%	none	551%
82	82	Good Samaritan Hospital		53%	add FF	-53%	none	-68%	none	14%	increase pressure drop	4324%
88	88	Medina General Hospital		3838%	add FF	54%	add FF	-9.3%	none	123%	add FF	2637%
95	95	St. Joseph's Hospital		-77%	none	-82%	none	-68%	none	-75%	none	103%
108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	486%	add FF	8.9%	increase pressure drop	-60%	none	80%	add FF	-67%
111	111	Wyoming Medical Center		192%	add FF	156%	add FF	200%	add ACI	-72%	none	11646%
86	86	Fairfield Medical Center		-11%	none	-79%	none	53%	add ACI	-19%	none	-65%
129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	-60%	none	-55%	none	-61%	none	-55%	none	-65%
115	115	Kona Community Hospital		-35%	none	-44%	none	-61%	none	-57%	none	-77%
116	116	Yukon-Kuskokwim Delta Regional Hospital		-35%	none	-44%	none	2166%	add DIFF and ACI	-46%	none	-3.9%
Total large												
Total medium												
Total small												
Total small rural												
Total nationwide												

Note:
Assume incinerators operating at 2/3 of capacity.

Key:
Emissions data unavailable; used average emissions data from similar units

Table 18. Nationwide MACT Floor Costs for Existing S

FACID	UNITID	Facility name	Unit number	MACT floor CDD/CDF control	CDD/CDF TEQ % Improvement Needed	MACT floor TEQ control	NO _x % Improvement Needed	MACT floor NO _x control	SO ₂ % Improvement Needed	MACT floor SO ₂ control
1	1	Bristol-Myers Squibb Co.		add ACI	2174%	add ACI	-15%	none	968%	add packed-bed scrubber
5	5	Merck & Company, Inc.		add ACI	278%	add ACI	-20%	none	-3.0%	none
15	15--1	Curtis Bay Energy	Unit 1	add ACI	1454%	add ACI	34%	add SNCR	721%	add packed-bed scrubber
15	15--2	Curtis Bay Energy	Unit 2	add ACI	297%	add ACI	28%	add SNCR	1141%	add packed-bed scrubber
20	20--1	Fort Detrick	Unit 5	add ACI	2529%	add ACI	-14%	none	2%	add caustic
20	20--2	Fort Detrick	Unit 6	add ACI	4255%	add ACI	-14%	none	2%	add caustic
29	29	Hamot Medical Center		increase activated carbon	203%	increase activated carbon	-6.3%	none	-0.9%	none
36	36--1	Merck & Company, Inc.	Unit 2	add ACI	52%	add ACI	-29%	none	-60%	none
36	36--2	Merck & Company, Inc.	Unit 5	add ACI	961%	add ACI	-33%	none	-16%	none
40	40	Charleston Area Medical Center, General Hospital		none	-47%	none	-34%	none	-26%	none
42	42	Stericycle, Inc.		increase activated carbon	2478%	increase activated carbon	6.6%	minor adjustment (marginal difference in NO _x)	-46%	none
43	43	Boca Raton Community Hospital		add ACI	2838%	add ACI	-14%	none	2%	add caustic
44	44	Bethesda Memorial Hospital		add ACI	4059%	add ACI	-37%	none	65%	add caustic
46	46	Holy Cross Hospital		add ACI	7573%	add ACI	-52%	none	-58%	none
48	48	Memorial Regional Hospital		add ACI	4345%	add ACI	1.3%	minor adjustment (marginal difference in NO _x)	22%	add caustic
51	51	Lakeland Regional Medical Center		add ACI	4346%	add ACI	-45%	none	-24%	none
54	54	Bayfront Medical Center		add ACI	2725%	add ACI	0.2%	minor adjustment (marginal difference in NO _x)	-55%	none
55	55	St. Joseph's Hospital		add ACI	4558%	add ACI	-12%	none	-10%	none
59	59--1	Stericycle, Inc.	Unit 1	add ACI	129%	add ACI	-14%	none	2%	add caustic
59	59--2	Stericycle, Inc.	Unit 2	add ACI	191%	add ACI	-14%	none	2%	add caustic

Table 18. Nationwide MACT Floor Costs for Existing S

FACID	UNITID	Facility name	Unit number	MACT floor CDD/CDF control	CDD/CDF TEQ % Improvement Needed	MACT floor TEQ control	NO _x % Improvement Needed	MACT floor NO _x control	SO ₂ % Improvement Needed	MACT floor SO ₂ control
60	60--1	BMWNC, Inc.	Unit 1	increase activated carbon	413%	increase activated carbon	-26%	none	151%	add packed-bed scrubber
65	65--1	Stericycle, Inc.	Unit 1	none	-64%	none	-14%	none	2%	add caustic
65	65--2	Stericycle, Inc.	Unit 2	none	-57%	none	-14%	none	2%	add caustic
71	71	Loyola University Medical Center		add ACI	2073%	add ACI	-24%	none	-71%	none
77	77	Parkview Hospital		add ACI	210%	add ACI	-14%	none	2%	add caustic
84	84	Mayo Clinic, Waste Management Facility		none	-60%	none	26%	add SNCR	-48%	none
87	87	MedCentral Health System, Mansfield Hospital		increase activated carbon	1832%	increase activated carbon	-14%	none	231%	add packed-bed scrubber
94	94	Stericycle, Inc.		add ACI	1078%	add ACI	-14%	none	2%	add caustic
98	98--1	University of Texas Medical Branch		increase activated carbon	3542%	increase activated carbon	-44%	none	-60%	none
106	106	Stericycle, Inc.		none (meets TEQ)	-39%	none	-14%	none	2%	add caustic
109	109	Healthcare Environmental Services Inc.		increase activated carbon	6630%	increase activated carbon	48%	add SNCR	620%	add packed-bed scrubber
110	110	Stericycle, Inc.		increase activated carbon	184%	increase activated carbon	63%	add SNCR	20%	increase sodium bicarbonate
120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	none	-72%	none	-48%	none	-57%	none
120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	none	-87%	none	-37%	none	-84%	none
125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		none	-82%	none	-52%	none	-48%	none
130	130	Department of Veterans Affairs Medical Center		none	-45%	none	-42%	none	171%	add caustic
13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		add ACI	425%	add ACI	-50%	none	-83%	none
16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		add ACI	1456%	add ACI	-56%	none	2.9%	add caustic
18	18	Franklin Square Hospital Center		add ACI	10163%	add ACI	-58%	none	288%	add packed-bed scrubber
21	21	Washington County Hospital		add ACI	13471%	add ACI	-47%	none	26%	add packed-bed scrubber
25	25	Holy Spirit Hospital		add ACI	209%	add ACI	-47%	none	26%	add caustic
30	30	Riddle Memorial Hospital		increase activated carbon	14500%	increase activated carbon	-38%	none	-88%	none
34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		none	-70%	none	-47%	none	-56%	none
38	38	Wilkes-Barre General Hospital		increase activated carbon	1885%	increase activated carbon	-47%	none	-32%	none
41	41	Thomas Memorial Hospital		none	-56%	none	-53%	none	-12%	none

Table 18. Nationwide MACT Floor Costs for Existing S

FACID	UNITID	Facility name	Unit number	MACT floor CDD/CDF control	CDD/CDF TEQ % Improvement Needed	MACT floor TEQ control	NO _x % Improvement Needed	MACT floor NO _x control	SO ₂ % Improvement Needed	MACT floor SO ₂ control
47	47	Malcolm Randall Veterans Affairs Medical Center		add ACI	1040%	add ACI	-26%	none	-9.4%	none
63	63	St. Jude Children's Research Hospital		increase activated carbon	1549%	increase activated carbon	-35%	none	-28%	none
81	81	South Bend Medical Foundation		add ACI	322%	add ACI	-93%	none	317%	add packed-bed scrubber
82	82	Good Samaritan Hospital		add ACI	897%	add ACI	-47%	none	26%	add caustic
88	88	Medina General Hospital		add ACI	4621%	add ACI	-47%	none	26%	add caustic
95	95	St. Joseph's Hospital		increase activated carbon	371%	increase activated carbon	-47%	none	-30%	none
108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	none	-69%	none	-36%	none	-67%	none
111	111	Wyoming Medical Center		add ACI	11401%	add ACI	-30%	none	-36%	none
86	86	Fairfield Medical Center		none	680%	none (meets total CDD/CDF)	-47%	none	26%	add caustic
129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	none	-43%	none	-47%	none	26%	add caustic
115	115	Kona Community Hospital		none	-76%	none	-14%	none	-92%	none
116	116	Yukon-Kuskokwim Delta Regional Hospital		none	-3.2%	none	-14%	none	-48%	none
Total large										
Total medium										
Total small										
Total small rural										
Total nationwide										

Note:
Assume incinerators operating at 2/3 of capacity.

Key:
Emissions data unavailable; used average emissions data from similar units

Table 18. Nationwide MACT Floor Costs for Existing S

FACID	UNITID	Facility name	Unit number	Consolidated MACT floor controls	APCD code with MACT floor controls	Packed-bed scrubber	DIFF	FF	Secondary chamber retrofit	SNCR	ACI	Increase carbon
1	1	Bristol-Myers Squibb Co.		replace FF with DIFF; add packed-bed scrubber and ACI	DIFF/WS	\$42,901	\$88,705				\$23,207	
5	5	Merck & Company, Inc.		improve FF performance, add ACI	DIFF						\$103,417	
15	15--1	Curtis Bay Energy	Unit 1	improve FF performance; add packed-bed scrubber, ACI, and SNCR	DIFF/WS	\$720,852				\$470,301	\$389,941	
15	15--2	Curtis Bay Energy	Unit 2	add packed-bed scrubber, ACI, and SNCR	DIFF/WS	\$795,808				\$519,204	\$430,488	
20	20--1	Fort Detrick	Unit 5	add DIFF, caustic, and ACI	DIFF/WS		\$210,314				\$34,125	
20	20--2	Fort Detrick	Unit 6	add DIFF, caustic, and ACI	DIFF/WS		\$200,268				\$32,495	
29	29	Hamot Medical Center		add packed-bed scrubber; increase activated carbon	DIFF/WS	\$96,315						\$39,400
36	36--1	Merck & Company, Inc.	Unit 2	add packed-bed scrubber and ACI	DIFF/WS	\$136,245					\$73,701	
36	36--2	Merck & Company, Inc.	Unit 5	add packed-bed scrubber and ACI	DIFF/WS	\$211,310					\$114,307	
40	40	Charleston Area Medical Center, General Hospital		increase natural gas; add packed-bed scrubber	DIFF/WS	\$112,514						
42	42	Stericycle, Inc.		secondary chamber retrofit; replace DIFF; add packed-bed scrubber; increase activated carbon; only minor adjustment of system to obtain additional NO _x control (marginal difference in NO _x)	DIFF/WS	\$182,374	\$319,605		\$141,587			\$74,605
43	43	Boca Raton Community Hospital		secondary chamber retrofit; add DIFF, caustic, and ACI	DIFF/WS		\$180,252		\$41,976		\$29,248	
44	44	Bethesda Memorial Hospital		add DIFF, caustic, and ACI	DIFF/WS		\$393,641				\$63,872	
46	46	Holy Cross Hospital		increase natural gas; add DIFF and ACI	DIFF/WS		\$293,112				\$47,560	
48	48	Memorial Regional Hospital		add DIFF, caustic, and ACI; only minor adjustment of system to obtain additional NO _x control (marginal difference in NO _x)	DIFF/WS		\$396,311				\$64,305	
51	51	Lakeland Regional Medical Center		secondary chamber retrofit; replace DIFF; increase lime; add ACI	DIFF		\$151,559		\$67,142		\$46,783	
54	54	Bayfront Medical Center		secondary chamber retrofit; add DIFF and ACI; only minor adjustment of system needed to obtain additional NO _x control (marginal difference in NO _x)	DIFF/WS		\$251,402		\$58,545		\$40,792	
55	55	St. Joseph's Hospital		increase natural gas, replace DIFF; add packed-bed scrubber and ACI	DIFF/WS	\$87,108	\$152,654				\$47,121	
59	59--1	Stericycle, Inc.	Unit 1	increase natural gas; add DIFF, caustic, and ACI	DIFF/WS		\$347,187				\$56,334	
59	59--2	Stericycle, Inc.	Unit 2	increase natural gas; add DIFF, caustic, and ACI	DIFF/WS		\$339,862				\$55,146	

Table 18. Nationwide MACT Floor Costs for Existing S

FACID	UNITID	Facility name	Unit number	Consolidated MACT floor controls	APCD code with MACT floor controls	Packed-bed scrubber	DIFF	FF	Secondary chamber retrofit	SNCR	ACI	Increase carbon
60	60--1	BMWNC, Inc.	Unit 1	secondary chamber retrofit; add packed-bed scrubber; increase activated carbon	DIFF/WS	\$176,005			\$136,642			\$71,999
65	65--1	Stericycle, Inc.	Unit 1	secondary chamber retrofit; add DIFF, caustic, and ACI	DIFF/WS		\$286,708		\$66,766		\$46,521	
65	65--2	Stericycle, Inc.	Unit 2	increase natural gas; add DIFF, caustic, and ACI	DIFF/WS		\$271,110				\$43,990	
71	71	Loyola University Medical Center		secondary chamber retrofit; add DIFF and ACI	DIFF/WS		\$305,960		\$71,250		\$49,645	
77	77	Parkview Hospital		increase natural gas; add DIFF, caustic, and ACI	DIFF/WS		\$240,003				\$38,943	
84	84	Mayo Clinic, Waste Management Facility		replace DIFF; add packed-bed scrubber; increase activated carbon; add SNCR	DIFF/WS	\$169,571	\$297,169			\$110,632		\$69,367
87	87	MedCentral Health System, Mansfield Hospital		increase natural gas; replace DIFF; add packed-bed scrubber; increase activated carbon	DIFF/WS	\$61,183	\$107,221					\$25,028
94	94	Stericycle, Inc.		increase natural gas; add DIFF, caustic, and ACI	DIFF/WS		\$237,443				\$38,527	
98	98--1	University of Texas Medical Branch		add DIFF and ACI	DIFF/WS		\$393,413				\$63,835	
106	106	Stericycle, Inc.		increase natural gas; add DIFF, caustic, and ACI	DIFF/WS		\$311,489				\$50,542	
109	109	Healthcare Environmental Services Inc.		secondary chamber retrofit; replace DIFF; add packed-bed scrubber and SNCR; increase activated carbon	DIFF/WS	\$116,542	\$204,236		\$90,478	\$76,035		\$47,674
110	110	Stericycle, Inc.		secondary chamber retrofit; add FF; increase sodium bicarbonate and activated carbon; add SNCR	DIFF-ESP/WS			\$421,177	\$127,110	\$106,819		\$66,976
120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	increase natural gas; replace DIFF; add packed-bed scrubber; increase activated carbon	DIFF/WS	\$261,054	\$457,490					\$106,791
120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	replace DIFF; add packed-bed scrubber	DIFF/WS	\$234,958	\$411,757					
125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		secondary chamber retrofit	CA/WS				\$63,117			
130	130	Department of Veterans Affairs Medical Center		add DIFF and caustic	DIFF/WS		\$557,193					
13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		add DIFF and ACI	DIFF/WS		\$225,769				\$13,716	
16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		secondary chamber retrofit; add DIFF, caustic, and ACI	DIFF/WS		\$216,360		\$28,438		\$13,145	
18	18	Franklin Square Hospital Center		secondary chamber retrofit; add DIFF, packed-bed scrubber, and ACI	DIFF/WS	\$109,457	\$343,441		\$45,142		\$20,865	
21	21	Washington County Hospital		secondary chamber retrofit; add DIFF, packed-bed scrubber, and ACI	DIFF/WS	\$66,912	\$209,949		\$27,596		\$12,755	
25	25	Holy Spirit Hospital		add DIFF, caustic, and ACI	DIFF/WS		\$194,928				\$11,843	
30	30	Riddle Memorial Hospital		add DIFF and ACI	DIFF/WS		\$198,032				\$12,031	
34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		add FF	FF/WS			\$188,819				
38	38	Wilkes-Barre General Hospital		add packed-bed scrubber; increase activated carbon	DIFF/WS	\$75,288						\$7,321
41	41	Thomas Memorial Hospital		add DIFF, caustic, and ACI	DIFF/WS		\$174,759				\$10,617	

Table 18. Nationwide MACT Floor Costs for Existing S

FACID	UNITID	Facility name	Unit number	Consolidated MACT floor controls	APCD code with MACT floor controls	Packed-bed scrubber	DIFF	FF	Secondary chamber retrofit	SNCR	ACI	Increase carbon
47	47	Malcolm Randall Veterans Affairs Medical Center		secondary chamber retrofit; add DIFF, packed-bed scrubber, and ACI	DIFF/WS	\$60,030	\$188,355		\$24,757		\$11,443	
63	63	St. Jude Children's Research Hospital		add packed-bed scrubber; increase activated carbon	DIFF/WS	\$85,139						\$8,279
81	81	South Bend Medical Foundation		add DIFF, packed-bed scrubber, and ACI	DIFF/WS	\$84,830	\$266,168				\$16,171	
82	82	Good Samaritan Hospital		add DIFF, caustic, and ACI	DIFF/WS		\$154,807				\$9,405	
88	88	Medina General Hospital		secondary chamber retrofit; add DIFF, caustic, and ACI	DIFF/WS		\$132,069		\$17,359		\$8,024	
95	95	St. Joseph's Hospital		add packed-bed scrubber; increase activated carbon	DIFF/WS	\$59,629						\$5,799
108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	add FF	FF/WS			\$159,666				
111	111	Wyoming Medical Center		increase natural gas; add DIFF and ACI	DIFF/WS		\$172,300				\$10,468	
86	86	Fairfield Medical Center		add caustic and ACI	WS						\$17,202	
129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	secondary chamber retrofit, add caustic	WS				\$15,884			
115	115	Kona Community Hospital		none	CC							
116	116	Yukon-Kuskokwim Delta Regional Hospital		add DIFF and ACI	DIFF		\$156,731				\$5,038	
Total large						\$3,404,738	\$7,406,064	\$421,177	\$864,613	\$1,282,991	\$1,984,847	\$501,841
Total medium						\$541,285	\$2,476,938	\$348,485	\$143,291	\$0	\$150,484	\$21,399
Total small						\$0	\$0	\$0	\$15,884	\$0	\$17,202	\$0
Total small rural						\$0	\$156,731	\$0	\$0	\$0	\$5,038	\$0
Total nationwide						\$3,946,023	\$10,039,734	\$769,662	\$1,023,788	\$1,282,991	\$2,157,571	\$523,241

Note:
Assume incinerators operating at 2/3 of capacity.

Key:
Emissions data unavailable; used average emissions data from similar units

Table 18. Nationwide MACT Floor Costs for Existing S

FACID	UNITID	Facility name	Unit number	Increase natural gas	Increase caustic	Increase lime	Increase NaHCO ₃	Improve FF performance	Total MACT floor control cost	Maintenance/inspection	Additional monitoring	DIFF monitoring	DI monitoring
1	1	Bristol-Myers Squibb Co.							\$154,813	\$900	DI, PB, ACI		\$4,800
5	5	Merck & Company, Inc.						\$15,808	\$119,225	\$900	ACI		
15	15--1	Curtis Bay Energy	Unit 1					\$59,605	\$1,640,699	\$900	PB, ACI, SNCR		
15	15--2	Curtis Bay Energy	Unit 2						\$1,745,500	\$900	PB, ACI, SNCR		
20	20--1	Fort Detrick	Unit 5		\$33				\$244,473	\$900	DIFF, ACI	\$9,000	
20	20--2	Fort Detrick	Unit 6		\$32				\$232,795	\$900	DIFF, ACI	\$9,000	
29	29	Hamot Medical Center							\$135,715	\$900	PB		
36	36--1	Merck & Company, Inc.	Unit 2						\$209,945	\$900	PB, ACI		
36	36--2	Merck & Company, Inc.	Unit 5						\$325,618	\$900	PB, ACI		
40	40	Charleston Area Medical Center, General Hospital		\$32,649					\$145,162	\$900	PB		
42	42	Stericycle, Inc.							\$718,171	\$900	PB		
43	43	Boca Raton Community Hospital			\$29				\$251,504	\$900	DIFF, ACI	\$9,000	
44	44	Bethesda Memorial Hospital			\$63				\$457,575	\$900	DIFF, ACI	\$9,000	
46	46	Holy Cross Hospital		\$25,512					\$366,184	\$900	DIFF, ACI	\$9,000	
48	48	Memorial Regional Hospital			\$63				\$460,680	\$900	DIFF, ACI	\$9,000	
51	51	Lakeland Regional Medical Center				\$17,358			\$282,842	\$900	ACI		
54	54	Bayfront Medical Center							\$350,740	\$900	DIFF, ACI	\$9,000	
55	55	St. Joseph's Hospital		\$25,277					\$312,159	\$900	ACI		
59	59--1	Stericycle, Inc.	Unit 1	\$30,219	\$55				\$433,796	\$900	DIFF, ACI	\$9,000	
59	59--2	Stericycle, Inc.	Unit 2	\$29,581	\$54				\$424,643	\$900	DIFF, ACI	\$9,000	

Table 18. Nationwide MACT Floor Costs for Existing S

FACID	UNITID	Facility name	Unit number	Increase natural gas	Increase caustic	Increase lime	Increase NaHCO ₃	Improve FF performance	Total MACT floor control cost	Maintenance/inspection	Additional monitoring	DIFF monitoring	DI monitoring
60	60--1	BMWNC, Inc.	Unit 1						\$384,647	\$900	PB		
65	65--1	Stericycle, Inc.	Unit 1		\$46				\$400,041	\$900	DIFF, ACI	\$9,000	
65	65--2	Stericycle, Inc.	Unit 2	\$23,597	\$43				\$338,740	\$900	DIFF, ACI	\$9,000	
71	71	Loyola University Medical Center							\$426,855	\$900	DIFF, ACI	\$9,000	
77	77	Parkview Hospital		\$20,890	\$38				\$299,874	\$900	DIFF, ACI	\$9,000	
84	84	Mayo Clinic, Waste Management Facility							\$646,739	\$900	PB, SNCR		
87	87	MedCentral Health System, Mansfield Hospital		\$17,754					\$211,185	\$900	PB		
94	94	Stericycle, Inc.		\$20,667	\$38				\$296,675	\$900	DIFF, ACI	\$9,000	
98	98--1	University of Texas Medical Branch							\$457,248	\$900	DIFF, ACI	\$9,000	
106	106	Stericycle, Inc.		\$27,112	\$50				\$389,193	\$900	DIFF, ACI	\$9,000	
109	109	Healthcare Environmental Services Inc.							\$534,964	\$900	PB, SNCR		
110	110	Stericycle, Inc.					\$128,318		\$850,401	\$900	FF, SNCR		
120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	\$75,751					\$901,086	\$900	PB		
120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2						\$646,714	\$900	PB		
125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant							\$63,117	\$900	none		
130	130	Department of Veterans Affairs Medical Center			\$89				\$557,282	\$900	DIFF	\$9,000	
13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility							\$239,486	\$900	DIFF, ACI	\$5,800	
16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment			\$26				\$257,969	\$900	DIFF, ACI	\$5,800	
18	18	Franklin Square Hospital Center							\$518,905	\$900	DIFF, ACI	\$5,800	
21	21	Washington County Hospital							\$317,213	\$900	DIFF, PB, ACI	\$5,800	
25	25	Holy Spirit Hospital			\$7				\$206,778	\$900	DIFF, ACI	\$5,800	
30	30	Riddle Memorial Hospital							\$210,063	\$900	DIFF, ACI	\$5,800	
34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator							\$188,819	\$900	FF		
38	38	Wilkes-Barre General Hospital							\$82,610	\$900	PB		
41	41	Thomas Memorial Hospital			\$6				\$185,382	\$900	DIFF, ACI	\$5,800	

Table 18. Nationwide MACT Floor Costs for Existing S

FACID	UNITID	Facility name	Unit number	Increase natural gas	Increase caustic	Increase lime	Increase NaHCO ₃	Improve FF performance	Total MACT floor control cost	Maintenance/inspection	Additional monitoring	DIFF monitoring	DI monitoring
47	47	Malcolm Randall Veterans Affairs Medical Center							\$284,585	\$900	DIFF, PB, ACI	\$5,800	
63	63	St. Jude Children's Research Hospital							\$93,418	\$900	PB		
81	81	South Bend Medical Foundation							\$367,168	\$900	DIFF, PB, ACI	\$5,800	
82	82	Good Samaritan Hospital			\$6				\$164,218	\$900	DIFF, ACI	\$5,800	
88	88	Medina General Hospital			\$5				\$157,456	\$900	DIFF, ACI	\$5,800	
95	95	St. Joseph's Hospital							\$65,428	\$900	PB		
108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1						\$159,666	\$900	FF		
111	111	Wyoming Medical Center		\$3,788					\$186,556	\$900	DIFF, ACI	\$5,800	
86	86	Fairfield Medical Center			\$6				\$17,208	\$900	ACI		
129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3		\$4				\$15,888	\$900	none		
115	115	Kona Community Hospital							\$0	\$0	none		
116	116	Yukon-Kuskokwim Delta Regional Hospital							\$161,770	\$0	DIFF, ACI	\$5,500	
Total large				\$329,009	\$632	\$17,358	\$128,318	\$75,413	\$16,417,002	\$32,400		\$153,000	\$4,800
Total medium				\$3,788	\$50	\$0	\$0	\$0	\$3,685,721	\$15,300		\$69,600	\$0
Total small				\$0	\$10	\$0	\$0	\$0	\$33,096	\$1,800		\$0	\$0
Total small rural				\$0	\$0	\$0	\$0	\$0	\$161,770	\$0		\$5,500	\$0
Total nationwide				\$332,797	\$692	\$17,358	\$128,318	\$75,413	\$20,297,589	\$49,500		\$228,100	\$4,800

Note:
Assume incinerators operating at 2/3 of capacity.

Key:
Emissions data unavailable; used average emissions data from similar units

Table 18. Nationwide MACT Floor Costs for Existing S

FACID	UNITID	Facility name	Unit number	FF monitoring	WS monitoring	SNCR monitoring	ACI monitoring	Total MACT floor monitoring cost	Additional stack testing	HCl testing	CO testing	Metals testing
1	1	Bristol-Myers Squibb Co.			\$5,200		\$4,800	\$15,700	metals, CDD/CDF, SO ₂ (already test for HCl)	\$0	\$0	\$14,000
5	5	Merck & Company, Inc.					\$4,800	\$5,700	metals, CDD/CDF	\$0	\$0	\$14,000
15	15--1	Curtis Bay Energy	Unit 1		\$5,200	\$3,100	\$4,800	\$14,000	metals, CDD/CDF, NO _x , SO ₂ (already test for HCl and PM)	\$0	\$0	\$14,000
15	15--2	Curtis Bay Energy	Unit 2		\$5,200	\$3,100	\$4,800	\$14,000	metals, CDD/CDF, NO _x , SO ₂ (already test for HCl)	\$0	\$0	\$14,000
20	20--1	Fort Detrick	Unit 5				\$4,800	\$14,700	metals, CDD/CDF, NO _x , SO ₂ (already test for PM)	\$0	\$0	\$14,000
20	20--2	Fort Detrick	Unit 6				\$4,800	\$14,700	metals, CDD/CDF, NO _x , SO ₂ (already test for PM)	\$0	\$0	\$14,000
29	29	Hamot Medical Center			\$5,200			\$6,100	CDD/CDF (already test for HCl)	\$0	\$0	\$0
36	36--1	Merck & Company, Inc.	Unit 2		\$5,200		\$4,800	\$10,900	CDD/CDF (already test for HCl)	\$0	\$0	\$0
36	36--2	Merck & Company, Inc.	Unit 5		\$5,200		\$4,800	\$10,900	metals, CDD/CDF (already test for HCl)	\$0	\$0	\$14,000
40	40	Charleston Area Medical Center, General Hospital			\$5,200			\$6,100	none (already test for HCl and CO)	\$0	\$0	\$0
42	42	Stericycle, Inc.			\$5,200			\$6,100	metals, CDD/CDF, NO _x (already test for HCl and CO)	\$0	\$0	\$14,000
43	43	Boca Raton Community Hospital					\$4,800	\$14,700	metals, CDD/CDF, NO _x , SO ₂ (already test for CO and PM)	\$0	\$0	\$14,000
44	44	Bethesda Memorial Hospital					\$4,800	\$14,700	metals, CDD/CDF, SO ₂ (already test for PM)	\$0	\$0	\$14,000
46	46	Holy Cross Hospital					\$4,800	\$14,700	metals, CDD/CDF (already test for CO and PM)	\$0	\$0	\$14,000
48	48	Memorial Regional Hospital					\$4,800	\$14,700	metals, CDD/CDF, NO _x , SO ₂ (already test for PM)	\$0	\$0	\$14,000
51	51	Lakeland Regional Medical Center					\$4,800	\$5,700	metals, CDD/CDF (already test for HCl and CO)	\$0	\$0	\$14,000
54	54	Bayfront Medical Center					\$4,800	\$14,700	metals, CDD/CDF, NO _x (already test for CO)	\$0	\$0	\$14,000
55	55	St. Joseph's Hospital					\$4,800	\$5,700	metals, CDD/CDF, SO ₂ (already test for HCl and CO)	\$0	\$0	\$14,000
59	59--1	Stericycle, Inc.	Unit 1				\$4,800	\$14,700	metals, CDD/CDF, NO _x , SO ₂ (already test for HCl, CO, and PM)	\$0	\$0	\$14,000
59	59--2	Stericycle, Inc.	Unit 2				\$4,800	\$14,700	metals, CDD/CDF, NO _x , SO ₂ (already test for HCl, CO, and PM)	\$0	\$0	\$14,000

Table 18. Nationwide MACT Floor Costs for Existing S

FACID	UNITID	Facility name	Unit number	FF monitoring	WS monitoring	SNCR monitoring	ACI monitoring	Total MACT floor monitoring cost	Additional stack testing	HCl testing	CO testing	Metals testing
60	60--1	BMWNC, Inc.	Unit 1		\$5,200			\$6,100	metals, CDD/CDF, SO ₂ (already test for HCl and CO)	\$0	\$0	\$14,000
65	65--1	Stericycle, Inc.	Unit 1				\$4,800	\$14,700	metals, NO _x , SO ₂ (already test for CO and PM)	\$0	\$0	\$14,000
65	65--2	Stericycle, Inc.	Unit 2				\$4,800	\$14,700	metals, NO _x , SO ₂ (already test for CO and PM)	\$0	\$0	\$14,000
71	71	Loyola University Medical Center					\$4,800	\$14,700	metals, CDD/CDF (already test for CO and PM)	\$0	\$0	\$14,000
77	77	Parkview Hospital					\$4,800	\$14,700	metals, CDD/CDF, NO _x , SO ₂ (already test for HCl, CO, and PM)	\$0	\$0	\$14,000
84	84	Mayo Clinic, Waste Management Facility			\$5,200	\$3,100		\$9,200	metals, NO _x (already test for HCl and PM)	\$0	\$0	\$14,000
87	87	MedCentral Health System, Mansfield Hospital			\$5,200			\$6,100	metals, CDD/CDF, NO _x , SO ₂ (already test for HCl and CO)	\$0	\$0	\$14,000
94	94	Stericycle, Inc.					\$4,800	\$14,700	metals, CDD/CDF, NO _x , SO ₂ (already test for CO and PM)	\$0	\$0	\$14,000
98	98--1	University of Texas Medical Branch					\$4,800	\$14,700	metals, CDD/CDF (already test for PM)	\$0	\$0	\$14,000
106	106	Stericycle, Inc.					\$4,800	\$14,700	metals, NO _x , SO ₂ (already test for CO and PM)	\$0	\$0	\$14,000
109	109	Healthcare Environmental Services Inc.			\$5,200	\$3,100		\$9,200	metals, CDD/CDF, NO _x , SO ₂ (already test for HCl, CO, and PM)	\$0	\$0	\$14,000
110	110	Stericycle, Inc.		\$4,200		\$3,100		\$8,200	metals, CDD/CDF, NO _x , SO ₂ (already test for HCl and CO)	\$0	\$0	\$14,000
120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1		\$5,200			\$6,100	metals (already test for HCl, CO, and PM)	\$0	\$0	\$14,000
120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2		\$5,200			\$6,100	none (already test for HCl, PM)	\$0	\$0	\$0
125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant						\$900	none (already test for CO)	\$0	\$0	\$0
130	130	Department of Veterans Affairs Medical Center						\$9,900	metals, SO ₂ (already test for HCl and PM)	\$0	\$0	\$14,000
13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility					\$1,600	\$8,300	metals, CDD/CDF (already test for PM)	\$0	\$0	\$14,000
16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment					\$1,600	\$8,300	metals, CDD/CDF, SO ₂ (already test for CO and PM)	\$0	\$0	\$14,000
18	18	Franklin Square Hospital Center					\$1,600	\$8,300	metals, CDD/CDF, SO ₂ (already test for CO and PM)	\$0	\$0	\$14,000
21	21	Washington County Hospital			\$5,200		\$1,600	\$13,500	metals, CDD/CDF, NO _x , SO ₂ (already test for HCl, CO, and PM)	\$0	\$0	\$14,000
25	25	Holy Spirit Hospital					\$1,600	\$8,300	metals, CDD/CDF, NO _x , SO ₂ (already test for PM)	\$0	\$0	\$14,000
30	30	Riddle Memorial Hospital					\$1,600	\$8,300	metals, CDD/CDF (already test for PM)	\$0	\$0	\$14,000
34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		\$4,200				\$5,100	metals, NO _x (already test for PM)	\$0	\$0	\$14,000
38	38	Wilkes-Barre General Hospital			\$5,200			\$6,100	metals, CDD/CDF, NO _x (already test for HCl)	\$0	\$0	\$14,000
41	41	Thomas Memorial Hospital					\$1,600	\$8,300	metals (already test for HCl and PM)	\$0	\$0	\$14,000

Table 18. Nationwide MACT Floor Costs for Existing S

FACID	UNITID	Facility name	Unit number	FF monitoring	WS monitoring	SNCR monitoring	ACI monitoring	Total MACT floor monitoring cost	Additional stack testing	HCl testing	CO testing	Metals testing
47	47	Malcolm Randall Veterans Affairs Medical Center			\$5,200		\$1,600	\$13,500	metals, CDD/CDF (already test for HCl, CO, and PM)	\$0	\$0	\$14,000
63	63	St. Jude Children's Research Hospital			\$5,200			\$6,100	CDD/CDF (already test for HCl)	\$0	\$0	\$0
81	81	South Bend Medical Foundation			\$5,200		\$1,600	\$13,500	metals, CDD/CDF, SO ₂ (already test for HCl)	\$0	\$0	\$14,000
82	82	Good Samaritan Hospital					\$1,600	\$8,300	metals, CDD/CDF, NO _x , SO ₂ (already test for PM)	\$0	\$0	\$14,000
88	88	Medina General Hospital					\$1,600	\$8,300	metals, CDD/CDF, NO _x , SO ₂ (already test for HCl, CO, and PM)	\$0	\$0	\$14,000
95	95	St. Joseph's Hospital			\$5,200			\$6,100	CDD/CDF, NO _x , SO ₂ (already test for HCl)	\$0	\$0	\$0
108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	\$4,200				\$5,100	metals (already test for PM)	\$0	\$0	\$14,000
111	111	Wyoming Medical Center					\$1,600	\$8,300	metals, CDD/CDF (already test for CO)	\$0	\$0	\$14,000
86	86	Fairfield Medical Center					\$3,200	\$4,100	metals, NO _x , SO ₂	\$0	\$0	\$14,000
129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3					\$900	NO _x , SO ₂ (already test for CO)	\$0	\$0	\$0
115	115	Kona Community Hospital						\$0	metals, NO _x , SO ₂	\$0	\$0	\$14,000
116	116	Yukon-Kuskokwim Delta Regional Hospital					\$1,300	\$6,800	Hg	\$0	\$0	\$14,000
Total large				\$4,200	\$72,800	\$15,500	\$115,200	\$397,900		\$0	\$0	\$434,000
Total medium				\$8,400	\$31,200	\$0	\$19,200	\$143,700		\$0	\$0	\$210,000
Total small				\$0	\$0	\$0	\$3,200	\$5,000		\$0	\$0	\$14,000
Total small rural				\$0	\$0	\$0	\$1,300	\$6,800		\$0	\$0	\$28,000
Total nationwide				\$12,600	\$104,000	\$15,500	\$138,900	\$553,400		\$0	\$0	\$686,000

Note:
Assume incinerators operating at 2/3 of capacity.

Key:
Emissions data unavailable; used average emissions data from similar units

Table 18. Nationwide MACT Floor Costs for Existing S

FACID	UNITID	Facility name	Unit number	PM testing	CDD/CDF testing	NO _x testing	SO ₂ testing	Opacity testing	Additional stack testing cost	VE testing cost	Additional annual stack testing	Annual PM testing	Annual CO testing	Annual HCl testing	Annual opacity testing
1	1	Bristol-Myers Squibb Co.		\$0	\$26,000	\$0	\$7,000	\$0	\$31,333	\$200	none	\$0	\$0	\$0	\$0
5	5	Merck & Company, Inc.		\$0	\$26,000	\$0	\$0	\$0	\$26,667	\$200	none	\$0	\$0	\$0	\$0
15	15--1	Curtis Bay Energy	Unit 1	\$0	\$26,000	\$7,000	\$7,000	\$0	\$36,000	\$200	none	\$0	\$0	\$0	\$0
15	15--2	Curtis Bay Energy	Unit 2	\$0	\$26,000	\$7,000	\$7,000	\$0	\$36,000	\$200	none	\$0	\$0	\$0	\$0
20	20--1	Fort Detrick	Unit 5	\$0	\$26,000	\$7,000	\$7,000	\$0	\$36,000	\$200	none	\$0	\$0	\$0	\$0
20	20--2	Fort Detrick	Unit 6	\$0	\$26,000	\$7,000	\$7,000	\$0	\$36,000	\$200	none	\$0	\$0	\$0	\$0
29	29	Hamot Medical Center		\$0	\$26,000	\$0	\$0	\$0	\$26,000	\$200	none	\$0	\$0	\$0	\$0
36	36--1	Merck & Company, Inc.	Unit 2	\$0	\$26,000	\$0	\$0	\$0	\$26,000	\$200	none	\$0	\$0	\$0	\$0
36	36--2	Merck & Company, Inc.	Unit 5	\$0	\$26,000	\$0	\$0	\$0	\$26,667	\$200	none	\$0	\$0	\$0	\$0
40	40	Charleston Area Medical Center, General Hospital		\$0	\$0	\$0	\$0	\$0	\$0	\$200	none	\$0	\$0	\$0	\$0
42	42	Stericycle, Inc.		\$0	\$26,000	\$7,000	\$0	\$0	\$31,333	\$200	none	\$0	\$0	\$0	\$0
43	43	Boca Raton Community Hospital		\$0	\$26,000	\$7,000	\$7,000	\$0	\$36,000	\$200	none	\$0	\$0	\$0	\$0
44	44	Bethesda Memorial Hospital		\$0	\$26,000	\$0	\$7,000	\$0	\$31,333	\$200	none	\$0	\$0	\$0	\$0
46	46	Holy Cross Hospital		\$0	\$26,000	\$0	\$0	\$0	\$26,667	\$200	none	\$0	\$0	\$0	\$0
48	48	Memorial Regional Hospital		\$0	\$26,000	\$7,000	\$7,000	\$0	\$36,000	\$200	none	\$0	\$0	\$0	\$0
51	51	Lakeland Regional Medical Center		\$0	\$26,000	\$0	\$0	\$0	\$26,667	\$200	none	\$0	\$0	\$0	\$0
54	54	Bayfront Medical Center		\$0	\$26,000	\$7,000	\$0	\$0	\$31,333	\$200	none	\$0	\$0	\$0	\$0
55	55	St. Joseph's Hospital		\$0	\$26,000	\$0	\$7,000	\$0	\$31,333	\$200	none	\$0	\$0	\$0	\$0
59	59--1	Stericycle, Inc.	Unit 1	\$0	\$26,000	\$7,000	\$7,000	\$0	\$36,000	\$200	none	\$0	\$0	\$0	\$0
59	59--2	Stericycle, Inc.	Unit 2	\$0	\$26,000	\$7,000	\$7,000	\$0	\$36,000	\$200	none	\$0	\$0	\$0	\$0

Table 18. Nationwide MACT Floor Costs for Existing S

FACID	UNITID	Facility name	Unit number	PM testing	CDD/CDF testing	NO _x testing	SO ₂ testing	Opacity testing	Additional stack testing cost	VE testing cost	Additional annual stack testing	Annual PM testing	Annual CO testing	Annual HCI testing	Annual opacity testing
60	60--1	BMWNC, Inc.	Unit 1	\$0	\$26,000	\$0	\$7,000	\$0	\$31,333	\$200	none	\$0	\$0	\$0	\$0
65	65--1	Stericycle, Inc.	Unit 1	\$0	\$0	\$7,000	\$7,000	\$0	\$18,667	\$200	none	\$0	\$0	\$0	\$0
65	65--2	Stericycle, Inc.	Unit 2	\$0	\$0	\$7,000	\$7,000	\$0	\$18,667	\$200	none	\$0	\$0	\$0	\$0
71	71	Loyola University Medical Center		\$0	\$26,000	\$0	\$0	\$0	\$26,667	\$200	none	\$0	\$0	\$0	\$0
77	77	Parkview Hospital		\$0	\$26,000	\$7,000	\$7,000	\$0	\$36,000	\$200	none	\$0	\$0	\$0	\$0
84	84	Mayo Clinic, Waste Management Facility		\$0	\$0	\$7,000	\$0	\$0	\$14,000	\$200	none	\$0	\$0	\$0	\$0
87	87	MedCentral Health System, Mansfield Hospital		\$0	\$26,000	\$7,000	\$7,000	\$0	\$36,000	\$200	none	\$0	\$0	\$0	\$0
94	94	Stericycle, Inc.		\$0	\$26,000	\$7,000	\$7,000	\$0	\$36,000	\$200	none	\$0	\$0	\$0	\$0
98	98--1	University of Texas Medical Branch		\$0	\$26,000	\$0	\$0	\$0	\$26,667	\$200	none	\$0	\$0	\$0	\$0
106	106	Stericycle, Inc.		\$0	\$0	\$7,000	\$7,000	\$0	\$18,667	\$200	none	\$0	\$0	\$0	\$0
109	109	Healthcare Environmental Services Inc.		\$0	\$26,000	\$7,000	\$7,000	\$0	\$36,000	\$200	none	\$0	\$0	\$0	\$0
110	110	Stericycle, Inc.		\$0	\$26,000	\$7,000	\$7,000	\$0	\$36,000	\$200	none	\$0	\$0	\$0	\$0
120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	\$0	\$0	\$0	\$0	\$0	\$14,000	\$200	none	\$0	\$0	\$0	\$0
120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	\$0	\$0	\$0	\$0	\$0	\$0	\$200	none	\$0	\$0	\$0	\$0
125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		\$0	\$0	\$0	\$0	\$0	\$0	\$200	none	\$0	\$0	\$0	\$0
130	130	Department of Veterans Affairs Medical Center		\$0	\$0	\$0	\$7,000	\$0	\$14,000	\$200	none	\$0	\$0	\$0	\$0
13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		\$0	\$26,000	\$0	\$0	\$0	\$26,667	\$200	none	\$0	\$0	\$0	\$0
16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		\$0	\$26,000	\$0	\$7,000	\$0	\$31,333	\$200	none	\$0	\$0	\$0	\$0
18	18	Franklin Square Hospital Center		\$0	\$26,000	\$0	\$7,000	\$0	\$31,333	\$200	none	\$0	\$0	\$0	\$0
21	21	Washington County Hospital		\$0	\$26,000	\$7,000	\$7,000	\$0	\$36,000	\$200	none	\$0	\$0	\$0	\$0
25	25	Holy Spirit Hospital		\$0	\$26,000	\$7,000	\$7,000	\$0	\$36,000	\$200	none	\$0	\$0	\$0	\$0
30	30	Riddle Memorial Hospital		\$0	\$26,000	\$0	\$0	\$0	\$26,667	\$200	none	\$0	\$0	\$0	\$0
34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		\$0	\$0	\$7,000	\$0	\$0	\$14,000	\$200	none	\$0	\$0	\$0	\$0
38	38	Wilkes-Barre General Hospital		\$0	\$26,000	\$7,000	\$0	\$0	\$31,333	\$200	none	\$0	\$0	\$0	\$0
41	41	Thomas Memorial Hospital		\$0	\$0	\$0	\$0	\$0	\$14,000	\$200	none	\$0	\$0	\$0	\$0

Table 18. Nationwide MACT Floor Costs for Existing S

FACID	UNITID	Facility name	Unit number	PM testing	CDD/CDF testing	NO _x testing	SO ₂ testing	Opacity testing	Additional stack testing cost	VE testing cost	Additional annual stack testing	Annual PM testing	Annual CO testing	Annual HCl testing	Annual opacity testing
47	47	Malcolm Randall Veterans Affairs Medical Center		\$0	\$26,000	\$0	\$0	\$0	\$26,667	\$200	none	\$0	\$0	\$0	\$0
63	63	St. Jude Children's Research Hospital		\$0	\$26,000	\$0	\$0	\$0	\$26,000	\$200	none	\$0	\$0	\$0	\$0
81	81	South Bend Medical Foundation		\$0	\$26,000	\$0	\$7,000	\$0	\$31,333	\$200	none	\$0	\$0	\$0	\$0
82	82	Good Samaritan Hospital		\$0	\$26,000	\$7,000	\$7,000	\$0	\$36,000	\$200	none	\$0	\$0	\$0	\$0
88	88	Medina General Hospital		\$0	\$26,000	\$7,000	\$7,000	\$0	\$36,000	\$200	none	\$0	\$0	\$0	\$0
95	95	St. Joseph's Hospital		\$0	\$26,000	\$7,000	\$7,000	\$0	\$26,667	\$200	none	\$0	\$0	\$0	\$0
108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	\$0	\$0	\$0	\$0	\$0	\$14,000	\$200	none	\$0	\$0	\$0	\$0
111	111	Wyoming Medical Center		\$0	\$26,000	\$0	\$0	\$0	\$26,667	\$200	none	\$0	\$0	\$0	\$0
86	86	Fairfield Medical Center		\$0	\$0	\$7,000	\$7,000	\$0	\$18,667	\$200	none	\$0	\$0	\$0	\$0
129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	\$0	\$0	\$7,000	\$7,000	\$0	\$9,333	\$200	none	\$0	\$0	\$0	\$0
115	115	Kona Community Hospital		\$0	\$0	\$7,000	\$7,000	\$0	\$18,667	\$200	PM, CO, HCl	\$12,000	\$7,000	\$7,000	\$0
116	116	Yukon-Kuskokwim Delta Regional Hospital		\$0	\$0	\$0	\$0	\$0	\$14,000	\$200	PM, CO, HCl	\$12,000	\$7,000	\$7,000	\$0
Total large				\$0	\$702,000	\$133,000	\$147,000	\$0	\$966,000	\$7,200		\$0	\$0	\$0	\$0
Total medium				\$0	\$364,000	\$49,000	\$56,000	\$0	\$470,667	\$3,400		\$0	\$0	\$0	\$0
Total small				\$0	\$0	\$14,000	\$14,000	\$0	\$28,000	\$400		\$0	\$0	\$0	\$0
Total small rural				\$0	\$0	\$7,000	\$7,000	\$0	\$32,667	\$400		\$24,000	\$14,000	\$14,000	\$0
Total nationwide				\$0	\$1,066,000	\$203,000	\$224,000	\$0	\$1,497,333	\$11,400		\$24,000	\$14,000	\$14,000	\$0

Note:
Assume incinerators operating at 2/3 of capacity.

Key:
Emissions data unavailable; used average emissions data from similar units

Table 18. Nationwide MACT Floor Costs for Existing S

FACID	UNITID	Facility name	Unit number	Annual stack testing cost	Total MACT floor testing cost	Read instructions	Performance spec test	Notification of performance test	Notification of CMS demonstration	Initial test report	Annual test report	Total MACT floor record-keeping and reporting cost	Total MACT floor cost
1	1	Bristol-Myers Squibb Co.		\$0	\$3,462	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$175,240
5	5	Merck & Company, Inc.		\$0	\$2,950	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$129,140
15	15--1	Curtis Bay Energy	Unit 1	\$0	\$3,975	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$1,659,938
15	15--2	Curtis Bay Energy	Unit 2	\$0	\$3,975	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$1,764,739
20	20--1	Fort Detrick	Unit 5	\$0	\$3,975	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$264,412
20	20--2	Fort Detrick	Unit 6	\$0	\$3,975	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$252,734
29	29	Hamot Medical Center		\$0	\$2,877	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$145,956
36	36--1	Merck & Company, Inc.	Unit 2	\$0	\$2,877	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$224,986
36	36--2	Merck & Company, Inc.	Unit 5	\$0	\$2,950	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$340,732
40	40	Charleston Area Medical Center, General Hospital		\$0	\$22	\$44	\$698	\$44	\$87	\$87	\$0	\$959	\$152,243
42	42	Stericycle, Inc.		\$0	\$3,462	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$728,998
43	43	Boca Raton Community Hospital		\$0	\$3,975	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$271,443
44	44	Bethesda Memorial Hospital		\$0	\$3,462	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$477,002
46	46	Holy Cross Hospital		\$0	\$2,950	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$385,098
48	48	Memorial Regional Hospital		\$0	\$3,975	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$480,619
51	51	Lakeland Regional Medical Center		\$0	\$2,950	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$292,756
54	54	Bayfront Medical Center		\$0	\$3,462	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$370,166
55	55	St. Joseph's Hospital		\$0	\$3,462	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$322,586
59	59--1	Stericycle, Inc.	Unit 1	\$0	\$3,975	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$453,735
59	59--2	Stericycle, Inc.	Unit 2	\$0	\$3,975	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$444,582

Table 18. Nationwide MACT Floor Costs for Existing S

FACID	UNITID	Facility name	Unit number	Annual stack testing cost	Total MACT floor testing cost	Read instructions	Performance spec test	Notification of performance test	Notification of CMS demonstration	Initial test report	Annual test report	Total MACT floor record-keeping and reporting cost	Total MACT floor cost
60	60--1	BMWNC, Inc.	Unit 1	\$0	\$3,462	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$395,473
65	65--1	Stericycle, Inc.	Unit 1	\$0	\$2,071	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$418,077
65	65--2	Stericycle, Inc.	Unit 2	\$0	\$2,071	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$356,776
71	71	Loyola University Medical Center		\$0	\$2,950	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$445,769
77	77	Parkview Hospital		\$0	\$3,975	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$319,813
84	84	Mayo Clinic, Waste Management Facility		\$0	\$1,559	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$658,763
87	87	MedCentral Health System, Mansfield Hospital		\$0	\$3,975	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$222,524
94	94	Stericycle, Inc.		\$0	\$3,975	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$316,614
98	98--1	University of Texas Medical Branch		\$0	\$2,950	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$476,163
106	106	Stericycle, Inc.		\$0	\$2,071	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$407,229
109	109	Healthcare Environmental Services Inc.		\$0	\$3,975	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$549,403
110	110	Stericycle, Inc.		\$0	\$3,975	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$863,840
120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	\$0	\$1,559	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$910,010
120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	\$0	\$22	\$44	\$698	\$44	\$87	\$87	\$0	\$959	\$653,796
125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		\$0	\$22	\$44	\$698	\$44	\$87	\$87	\$0	\$959	\$64,998
130	130	Department of Veterans Affairs Medical Center		\$0	\$1,559	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$570,006
13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		\$0	\$2,950	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$252,000
16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		\$0	\$3,462	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$270,996
18	18	Franklin Square Hospital Center		\$0	\$3,462	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$531,932
21	21	Washington County Hospital		\$0	\$3,975	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$335,952
25	25	Holy Spirit Hospital		\$0	\$3,975	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$220,317
30	30	Riddle Memorial Hospital		\$0	\$2,950	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$222,578
34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		\$0	\$1,559	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$196,743
38	38	Wilkes-Barre General Hospital		\$0	\$3,462	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$93,436
41	41	Thomas Memorial Hospital		\$0	\$1,559	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$196,506

Table 18. Nationwide MACT Floor Costs for Existing S

FACID	UNITID	Facility name	Unit number	Annual stack testing cost	Total MACT floor testing cost	Read instructions	Performance spec test	Notification of performance test	Notification of CMS demonstration	Initial test report	Annual test report	Total MACT floor record-keeping and reporting cost	Total MACT floor cost
47	47	Malcolm Randall Veterans Affairs Medical Center		\$0	\$2,950	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$302,299
63	63	St. Jude Children's Research Hospital		\$0	\$2,877	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$103,659
81	81	South Bend Medical Foundation		\$0	\$3,462	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$385,394
82	82	Good Samaritan Hospital		\$0	\$3,975	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$177,757
88	88	Medina General Hospital		\$0	\$3,975	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$170,995
95	95	St. Joseph's Hospital		\$0	\$2,950	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$75,742
108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	\$0	\$1,559	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$167,589
111	111	Wyoming Medical Center		\$0	\$2,950	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$199,070
86	86	Fairfield Medical Center		\$0	\$2,071	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$24,644
129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	\$0	\$1,047	\$44	\$698	\$87	\$87	\$349	\$0	\$1,264	\$19,099
115	115	Kona Community Hospital		\$17,333	\$19,405	\$44	\$698	\$87	\$87	\$349	\$1,744	\$3,009	\$22,413
116	116	Yukon-Kuskokwim Delta Regional Hospital		\$17,333	\$18,892	\$44	\$698	\$87	\$87	\$349	\$1,744	\$3,009	\$190,471
Total large				\$0	\$106,852	\$1,570	\$25,114	\$3,009	\$3,139	\$11,772	\$0	\$44,604	\$16,966,359
Total medium				\$0	\$52,050	\$741	\$11,860	\$1,482	\$1,482	\$5,930	\$0	\$21,496	\$3,902,966
Total small				\$0	\$3,118	\$87	\$1,395	\$174	\$174	\$698	\$0	\$2,529	\$43,743
Total small rural				\$34,667	\$38,297	\$87	\$1,395	\$174	\$174	\$698	\$3,488	\$6,017	\$212,884
Total nationwide				\$34,667	\$200,317	\$2,485	\$39,765	\$4,840	\$4,971	\$19,097	\$3,488	\$74,646	\$21,125,952

Note:
Assume incinerators operating at 2/3 of capacity.

Key:
Emissions data unavailable; used average emissions data from similar units

Table 19. Nationwide Beyond-the-Floor Costs for Existing Sources

FACID	UNITID	Facility name	Unit number	City	State	Category	New/ existing	APCD code	APCD type	APCD description
1	1	Bristol-Myers Squibb Co.		Wallingford	CT	L	E	FF	Dry	Secondary chamber (1800F) and baghouse
5	5	Merck & Company, Inc.		Rahway	NJ	L	E	DIFF	Dry	Secondary chamber (1500F, 1 sec), partial quench, dry acid gas scrubber with dry lime injection, and baghouse
15	15--1	Curtis Bay Energy	Unit 1	Baltimore	MD	L	E	DIFF	Dry	Secondary chamber, dry scrubber, and baghouse
15	15--2	Curtis Bay Energy	Unit 2	Baltimore	MD	L	E	DIFF	Dry	Secondary chamber, dry scrubber, and baghouse
20	20--1	Fort Detrick	Unit 5	Fort Detrick	MD	L	E	WS	Wet	Secondary chamber and rotary atomizing wet scrubber
20	20--2	Fort Detrick	Unit 6	Fort Detrick	MD	L	E	WS	Wet	Secondary chamber and rotary atomizing wet scrubber
29	29	Hamot Medical Center		Erie	PA	L	E	DIFF/WS	Dry/wet	Secondary chamber (2000F, 2 sec), lime injection system, powdered activated carbon injection system, baghouse, and vertical upflow two-stage multi-microventuri scrubber system
36	36--1	Merck & Company, Inc.	Unit 2	West Point (Upper Gwynedd Township)	PA	L	E	DIFF	Dry	Secondary/tertiary chamber (2000F, 2 sec), water quench followed by sodium bicarbonate injection system with dry reaction chamber and pulse-jet baghouse
36	36--2	Merck & Company, Inc.	Unit 5	West Point (Upper Gwynedd Township)	PA	L	E	DIFF	Dry	Secondary chamber (1800F, 2.2 sec), water quench followed by sodium bicarbonate injection system and pulse-jet baghouse
40	40	Charleston Area Medical Center, General Hospital		Charleston	WV	L	E	DIFF	Dry	Secondary chamber (1800F, 2 sec), dry injection/baghouse scrubber system with activated carbon
42	42	Stericycle, Inc.		Apopka	FL	L	E	DIFF	Dry	Secondary chamber (1800, 1 sec), dry scrubbing system with quench chamber, passive absorber, lime and carbon injection, and baghouse.
43	43	Boca Raton Community Hospital		Boca Raton	FL	L	E	WS	Wet	Secondary chamber (1800F, 1 sec) and rotary atomizing wet scrubber system with caustic soda injection
44	44	Bethesda Memorial Hospital		Boynton Beach	FL	L	E	WS	Wet	Secondary chamber (1800F, 2 sec) and rotary atomizing scrubber with mist eliminator
46	46	Holy Cross Hospital		Fort Lauderdale	FL	L	E	WS	Wet	Secondary chamber (1800F, 1 sec) and venturi scrubber with packed bed absorption unit using dilute NaOH
48	48	Memorial Regional Hospital		Hollywood	FL	L	E	WS/WESP	Wet	Secondary chamber (1800F, 1 sec), packed column gas scrubber, and wet ESP
51	51	Lakeland Regional Medical Center		Lakeland	FL	L	E	DIFF	Dry	Secondary chamber (1800F, 1 sec), lime injection system, and baghouse
54	54	Bayfront Medical Center		St. Petersburg	FL	L	E	WS	Wet	Secondary chamber (1800F, 1 sec) and flux force/condensation collision scrubber system using dilute NaOH

Table 19. Nationwide Beyond-the-Floor Costs for Existing Sources

FACID	UNITID	Facility name	Unit number	City	State	Category	New/ existing	APCD code	APCD type	APCD description
55	55	St. Joseph's Hospital		Tampa	FL	L	E	DIFF/WS	Dry/wet	Secondary chamber (1800F, 1 sec), lime injection, baghouse, and venturi scrubber
59	59--1	Stericycle, Inc.	Unit 1	Haw River	NC	L	E	WS	Wet	Secondary chamber (1800F, 1 sec), rapid gas quench system, wet scrubber system consisting of a packed bed absorber and venturi scrubber, and demister.
59	59--2	Stericycle, Inc.	Unit 2	Haw River	NC	L	E	WS	Wet	Secondary chamber (1800F, 1 sec), rapid gas quench system, wet scrubber system consisting of a packed bed absorber and venturi scrubber, and demister.
60	60--1	BMWNC, Inc.	Unit 1	Matthews	NC	L	E	DIFF	Dry	Secondary chamber (1641F), dry scrubber with lime and activated carbon injection, and baghouse
65	65--1	Stericycle, Inc.	Unit 1	Clinton	IL	L	E	WS	Wet	Secondary chamber (1800F), venturi scrubber, and condensing absorber
65	65--2	Stericycle, Inc.	Unit 2	Clinton	IL	L	E	WS	Wet	Secondary chamber (1800F), venturi scrubber, and condensing absorber
71	71	Loyola University Medical Center		Maywood	IL	L	E	WS	Wet	Two secondary chambers (1600F), twin rotary atomizer scrubber using 50% caustic solution, and two demister pads
77	77	Parkview Hospital		Fort Wayne	IN	L	E	WS	Wet	Secondary chamber and wet scrubber
84	84	Mayo Clinic, Waste Management Facility		Rochester	MN	L	E	DIFF	Dry	Secondary chamber (1800F, 1 sec) and baghouse with lime and carbon injection
87	87	MedCentral Health System, Mansfield Hospital		Mansfield	OH	L	E	DIFF	Dry	Secondary chamber (1800F, 2 sec) and baghouse with lime and carbon injection system
94	94	Stericycle, Inc.		Warren	OH	L	E	WS	Wet	Secondary chamber (1800F, 2 sec), wet scrubber
98	98--1	University of Texas Medical Branch		Galveston	TX	L	E	WS	Wet	Secondary chamber, packed tower, and venturi scrubber with activated carbon injection
106	106	Stericycle, Inc.		Kansas City	KS	L	E	WS	Wet	Secondary chamber (1800F, 2 sec), wet scrubber
109	109	Healthcare Environmental Services Inc.		Fargo	ND	L	E	DIFF	Dry	Secondary chamber (1800F) and dry scrubber/baghouse system with lime and carbon injection
110	110	Stericycle, Inc.		North Salt Lake	UT	L	E	DI-ESP/WS	Dry/wet	Secondary chamber (1834F), carbon injection system, ESP, dry scrubber, and wet gas absorber
120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	Anahuac	TX	L	N	DIFF	Dry	Secondary chamber, baghouse with virgin lime injection, urea injection, and activated carbon injection
120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	Anahuac	TX	L	N	DIFF	Dry	Secondary chamber, baghouse with virgin lime injection, urea injection, and activated carbon injection
125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		Greenville	NC	L	N	CA/WS	Dry/wet	Secondary chamber (1985F), rotary atomizing wet scrubber (with NaOH scrubbing medium), carbon bed adsorber, HEPA filtering system, and heat recovery system

Table 19. Nationwide Beyond-the-Floor Costs for Existing Sources

FACID	UNITID	Facility name	Unit number	City	State	Category	New/existing	APCD code	APCD type	APCD description
130	130	Department of Veterans Affairs Medical Center		Miami	FL	L	E	WS	Wet	Secondary chamber (1800F, 1 sec), venturi scrubber, and packed tower absorber
13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		Baltimore	MD	M	E	WS	Wet	Secondary chamber (1832F) and venturi caustic scrubber with packed-bed scrubber
16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		Baltimore	MD	M	E	WS	Wet	Secondary chamber (1800F) and venturi wet scrubber followed by saturation chamber and mist eliminator
18	18	Franklin Square Hospital Center		Baltimore	MD	M	E	WS	Wet	Secondary chamber (1800F) and venturi scrubber followed by quench chamber and mist eliminator
21	21	Washington County Hospital		Hagerstown	MD	M	E	WS	Wet	Secondary chamber and venturi caustic scrubber
25	25	Holy Spirit Hospital		Camp Hill	PA	M	E	WS	Wet	Secondary chamber (1800F) and venturi scrubber with prequench and NaOH injection
30	30	Riddle Memorial Hospital		Media	PA	M	E	WS	Wet	Secondary chamber (1800F, 2 sec), caustic packed tower scrubber, and high pressure venturi, with activated carbon injection
34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		State College	PA	M	E	WS	Wet	Secondary chamber (1900F) and rotary atomizing wet scrubber with demister
38	38	Wilkes-Barre General Hospital	38	Wilkes-Barre	PA	M	N	DIFF	Dry	Secondary/tertiary chambers (1800F, 2.85 sec) and dry scrubber/baghouse with lime and activated carbon injection
41	41	Thomas Memorial Hospital		South Charleston	WV	M	E	WS	Wet	Secondary chamber (1800F) and venturi packed tower wet scrubber with caustic injection
47	47	Malcolm Randall Veterans Affairs Medical Center		Gainesville	FL	M	E	WS	Wet	Secondary chamber (1800F, 1 sec) and wet scrubber with caustic soda injection
63	63	St. Jude Children's Research Hospital		Memphis	TN	M	E	DIFF	Dry	Secondary chamber (1528F) and baghouse with sodium bicarbonate and carbon injection
81	81	South Bend Medical Foundation		South Bend	IN	M	E	WS	Wet	Secondary chamber and wet scrubber
82	82	Good Samaritan Hospital		Vincennes	IN	M	E	WS	Wet	Secondary chamber and multi-chamber spray scrubber
88	88	Medina General Hospital		Medina	OH	M	E	WS	Wet	Secondary chamber (1800F, 1 sec) and wet scrubber
95	95	St. Joseph's Hospital		Marshfield	WI	M	E	DIFF	Dry	Secondary chamber (1800F), quench tower, and baghouse with lime/carbon injection
108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	Hamilton	MT	M	E	WS	Wet	Secondary chamber and wet scrubber
111	111	Wyoming Medical Center		Casper	WY	M	E	WS	Wet	Secondary chamber and wet scrubber
86	86	Fairfield Medical Center		Lancaster	OH	S	E	WS	Wet	Secondary chamber (1800F, 1 sec) and wet scrubber
129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	Atlanta	GA	S	N	WS	Wet	Secondary chamber (1800F, 1.68 sec) and rotary atomizing wet scrubber
115	115	Kona Community Hospital		Kealahou	HI	SR	E	CC	Comb ctrl	Secondary chamber (1900F, 2 sec), no APCD
116	116	Yukon-Kuskokwim Delta Regional Hospital		Bethel	AK	SR	E	CC	Comb ctrl	Secondary chamber, no APCD

Table 19. Nationwide Beyond-the-Floor Costs for Existing Sources

FACID	UNITID	Facility name	Unit number	City	State	Category	New/ existing	APCD code	APCD type	APCD description
Total large										
Total medium										
Total small										
Total small rural										
Total nationwide										

Note:

Assume incinerators operating at 2/3 of capacity.

Key:

Emissions data unavailable; used average emissions data from similar units (size, APCD) to estimate emissions

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	Maximum charge rate (lb/hr)	Stack gas flow rate (dscfm)	Stack gas temperature (°F)	Operating hours (hr/yr)	Autoclave (\$/lb)	Landfill tip fee region	Landfill tip fee (\$/ton)	Autoclave/landfill cost	HCl unit average (ppmvd)	CO unit average (ppmvd)	Pb unit average (mg/dscm)	Cd unit average (mg/dscm)
1	1	Bristol-Myers Squibb Co.		1,000	1,648	217	2,072	\$0.02	Northeast	\$70.53	\$72,413	65.7	0.983	0.319	0.00364
5	5	Merck & Company, Inc.		799	7,346	246	4,321	\$0.02	Mid-Atlantic	\$46.29	\$92,623	0.780	1.41	0.0155	0.00265
15	15--1	Curtis Bay Energy	Unit 1	7,083	27,698	296	8,736	\$0.02	Mid-Atlantic	\$46.29	\$1,660,043	85.2	1.26	0.00504	0.000887
15	15--2	Curtis Bay Energy	Unit 2	7,083	30,578	303	8,736	\$0.02	Mid-Atlantic	\$46.29	\$1,660,043	76.9	2.91	0.00769	0.00130
20	20--1	Fort Detrick	Unit 5	1,000	2,424	87	1,300	\$0.02	Mid-Atlantic	\$46.29	\$34,876	0.190	0.871	0.126	0.00992
20	20--2	Fort Detrick	Unit 6	1,000	2,308	92	1,300	\$0.02	Mid-Atlantic	\$46.29	\$34,876	0.353	1.17	0.182	0.00867
29	29	Hamot Medical Center		1,060	3,701	122	2,080	\$0.02	Mid-Atlantic	\$46.29	\$59,151	16.6	2.60	0.00675	0.00119
36	36--1	Merck & Company, Inc.	Unit 2	2,000	5,235	358	865	\$0.02	Mid-Atlantic	\$46.29	\$46,413	4.22	2.46	0.00115	0.000853
36	36--2	Merck & Company, Inc.	Unit 5	3,045	8,119	304	5,753	\$0.02	Mid-Atlantic	\$46.29	\$469,971	3.75	1.07	0.0109	0.00242
40	40	Charleston Area Medical Center, General Hospital		1,000	4,323	312	1,248	\$0.02	Mid-Atlantic	\$46.29	\$33,481	26.6	11.3	0.00468	0.00186
42	42	Stericycle, Inc.		1,900	7,008	327	7,951	\$0.02	South	\$30.97	\$327,757	27.1	10.7	0.0434	0.00886
43	43	Boca Raton Community Hospital		730	2,078	91	8,736	\$0.02	South	\$30.97	\$138,361	0.986	6.46	0.0883	0.00537
44	44	Bethesda Memorial Hospital		1,000	4,537	106	3,024	\$0.02	South	\$30.97	\$65,608	0.608	2.74	0.0774	0.00929
46	46	Holy Cross Hospital		1,300	3,378	124	2,964	\$0.02	South	\$30.97	\$83,599	1.18	4.91	0.0618	0.0168
48	48	Memorial Regional Hospital		1,800	4,568	143	4,992	\$0.02	South	\$30.97	\$194,950	1.02	1.17	0.0928	0.00560
51	51	Lakeland Regional Medical Center		750	3,323	212	6,247	\$0.02	South	\$30.97	\$101,651	2.68	6.35	0.0348	0.00365
54	54	Bayfront Medical Center		1,500	2,898	133	3,352	\$0.02	South	\$30.97	\$109,087	0.947	9.36	0.0976	0.00379

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	Maximum charge rate (lb/hr)	Stack gas flow rate (dscfm)	Stack gas temperature (°F)	Operating hours (hr/yr)	Autoclave (\$/lb)	Landfill tip fee region	Landfill tip fee (\$/ton)	Autoclave/landfill cost	HCl unit average (ppmvd)	CO unit average (ppmvd)	Pb unit average (mg/dscm)	Cd unit average (mg/dscm)
55	55	St. Joseph's Hospital		1,500	3,347	400	8,008	\$0.02	South	\$30.97	\$260,611	12.5	5.85	0.0740	0.00205
59	59--1	Stericycle, Inc.	Unit 1	1,911	4,002	135	8,400	\$0.02	South	\$30.97	\$348,271	4.24	3.95	0.206	0.0233
59	59--2	Stericycle, Inc.	Unit 2	1,911	3,917	138	8,400	\$0.02	South	\$30.97	\$348,271	3.88	4.61	0.206	0.0188
60	60--1	BMWNC, Inc.	Unit 1	1,500	6,763	343	7,456	\$0.02	South	\$30.97	\$242,647	38.8	15.1	0.00335	0.000532
65	65--1	Stericycle, Inc.	Unit 1	1,500	3,304	143	7,665	\$0.02	Midwest	\$34.96	\$264,808	1.12	12.9	0.200	0.00572
65	65--2	Stericycle, Inc.	Unit 2	1,500	3,125	141	7,558	\$0.02	Midwest	\$34.96	\$261,102	1.43	5.77	0.134	0.0123
71	71	Loyola University Medical Center		1,650	3,526	156	4,800	\$0.02	Midwest	\$34.96	\$182,418	2.22	7.07	0.178	0.0152
77	77	Parkview Hospital		1,200	2,766	114	8,395	\$0.02	Midwest	\$34.96	\$232,030	2.68	5.90	0.177	0.0802
84	84	Mayo Clinic, Waste Management Facility		2,000	6,516	294	6,240	\$0.02	Midwest	\$34.96	\$287,446	15.2	2.24	0.291	0.0101
87	87	MedCentral Health System, Mansfield Hospital		600	2,351	260	3,120	\$0.02	Midwest	\$34.96	\$43,117	24.8	4.81	0.0415	0.00113
94	94	Stericycle, Inc.		1,400	2,737	138	7,904	\$0.02	Midwest	\$34.96	\$254,869	0.661	4.45	0.244	0.00524
98	98--1	University of Texas Medical Branch		1,500	4,534	111	5,328	\$0.02	South Central	\$24.06	\$154,893	2.12	1.73	0.756	0.00298
106	106	Stericycle, Inc.		1,500	3,590	152	8,760	\$0.02	West Central	\$24.13	\$254,975	0.567	4.62	0.127	0.00396
109	109	Healthcare Environmental Services Inc.		1,686	4,478	302	1,872	\$0.02	West Central	\$24.13	\$61,244	72.5	14.7	0.0171	0.00296
110	110	Stericycle, Inc.		1,935	6,291	126	7,309	\$0.02	West Central	\$24.13	\$274,436	3.93	7.39	0.0309	0.00214
120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	4,167	10,031	296	7,896	\$0.02	South Central	\$24.06	\$637,686	11.0	3.96	0.0187	0.00132
120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	4,167	9,028	291	7,896	\$0.02	South Central	\$24.06	\$637,686	5.30	2.86	0.00778	0.000889
125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		1,000	3,124	125	625	\$0.02	South	\$30.97	\$13,555	1.58	10.7	0.000296	0.000106

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	Maximum charge rate (lb/hr)	Stack gas flow rate (dscfm)	Stack gas temperature (°F)	Operating hours (hr/yr)	Autoclave (\$/lb)	Landfill tip fee region	Landfill tip fee (\$/ton)	Autoclave/landfill cost	HCl unit average (ppmvd)	CO unit average (ppmvd)	Pb unit average (mg/dscm)	Cd unit average (mg/dscm)
130	130	Department of Veterans Affairs Medical Center		1,000	6,422	155	4,160	\$0.02	South	\$30.97	\$90,255	8.32	1.00	0.0435	0.00564
13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		500	1,972	189	1,440	\$0.02	Mid-Atlantic	\$46.29	\$22,880	0.708	1.50	0.973	0.122
16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		320	1,890	179	1,350	\$0.02	Mid-Atlantic	\$46.29	\$13,728	1.39	11.8	0.331	0.0472
18	18	Franklin Square Hospital Center		500	2,999	54	5,408	\$0.02	Mid-Atlantic	\$46.29	\$85,927	1.48	5.363	0.262	0.0474
21	21	Washington County Hospital		500	1,834	112	2,496	\$0.02	Mid-Atlantic	\$46.29	\$39,659	6.26	6.62	0.164	0.0139
25	25	Holy Spirit Hospital		500	1,702	99	3,944	\$0.02	Mid-Atlantic	\$46.29	\$62,666	0.736	1.88	0.155	0.0439
30	30	Riddle Memorial Hospital		500	1,730	239	2,920	\$0.02	Mid-Atlantic	\$46.29	\$46,396	2.10	1.41	0.178	0.00366
34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		500	2,117	175	1,022	\$0.02	Mid-Atlantic	\$46.29	\$16,238	1.27	2.11	0.151	0.00408
38	38	Wilkes-Barre General Hospital		400	2,063	274	4,472	\$0.02	Mid-Atlantic	\$46.29	\$56,844	8.95	2.08	0.00406	0.00106
41	41	Thomas Memorial Hospital		470	1,526	146	2,080	\$0.02	Mid-Atlantic	\$46.29	\$31,066	2.62	0.946	0.723	0.0297
47	47	Malcolm Randall Veterans Affairs Medical Center		495	1,645	115	1,664	\$0.02	South	\$30.97	\$21,947	4.69	11.6	0.227	0.0877
63	63	St. Jude Children's Research Hospital		500	2,333	276	1,050	\$0.02	South	\$30.97	\$13,989	27.5	0.679	0.00485	0.00152
81	81	South Bend Medical Foundation		470	2,325	121	2,028	\$0.02	Midwest	\$34.96	\$26,672	12.3	2.06	0.539	0.00176
82	82	Good Samaritan Hospital		500	1,352	128	2,574	\$0.02	Midwest	\$34.96	\$36,013	1.58	1.91	0.0261	0.00336
88	88	Medina General Hospital		300	1,153	100	3,016	\$0.02	Midwest	\$34.96	\$25,318	3.29	14.1	0.669	0.0109
95	95	St. Joseph's Hospital		500	1,634	223	1,404	\$0.02	Midwest	\$34.96	\$19,644	5.27	2.15	0.00397	0.00128
108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	500	1,790	112	1,248	\$0.02	West Central	\$24.13	\$15,197	0.455	1.97	0.0996	0.00773
111	111	Wyoming Medical Center		400	1,505	130	989	\$0.02	West Central	\$24.13	\$9,635	1.17	3.28	0.0496	0.0182
86	86	Fairfield Medical Center		95	1,095	97	5,018	\$0.06	Midwest	\$34.96	\$23,343	1.03	2.27	0.161	0.00256
129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	120	715	163	2,920	\$0.06	South	\$30.97	\$16,690	1.30	12.11	0.0727	0.00545
115	115	Kona Community Hospital		200	684	1,787	1,430	\$0.06	West	\$37.74	\$14,271	135	7.00	0.226	0.0380
116	116	Yukon-Kuskokwim Delta Regional Hospital		50	559	1,457	1,560	\$0.06	West	\$37.74	\$3,892	298	5.41	0.226	0.0380

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	Maximum charge rate (lb/hr)	Stack gas flow rate (dscfm)	Stack gas temperature (°F)	Operating hours (hr/yr)	Autoclave (\$/lb)	Landfill tip fee region	Landfill tip fee (\$/ton)	Autoclave/landfill cost	HCl unit average (ppmvd)	CO unit average (ppmvd)	Pb unit average (mg/dscm)	Cd unit average (mg/dscm)
Total large											\$10,035,221				
Total medium											\$543,819				
Total small											\$40,033				
Total small rural											\$18,163				
Total nationwide											\$10,637,237				

Note:
Assume incinerators operating at 2/3 of capacity.

Key:
Emissions data unavailable; used average emissions data from similar unit

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	Hg unit average (mg/dscm)	PM unit average (gr/dscf)	CDD/CDF unit average (ng/dscm)	TEQ unit average (ng/dscm)	NO _x unit average (ppmv)	SO ₂ unit average (ppmv)	Beyond-the-floor HCl limit (ppmv)	Beyond-the-floor CO limit (ppmv)	Beyond-the-floor Pb limit (mg/dscm)	Beyond-the-floor Cd limit (mg/dscm)	Beyond-the-floor Hg limit (mg/dscm)	Beyond-the-floor PM limit (gr/dscf)
1	1	Bristol-Myers Squibb Co.		0.000695	0.00180	36.9	0.659	119	29.9	0.75	2.9	0.00047	0.00012	0.00093	0.0048
5	5	Merck & Company, Inc.		0.00353	0.00330	12.8	0.110	112	2.72	0.75	2.9	0.00047	0.00012	0.00093	0.0048
15	15--1	Curtis Bay Energy	Unit 1	0.174	0.00823	27.7	0.451	187	23.0	0.75	2.9	0.00047	0.00012	0.00093	0.0048
15	15--2	Curtis Bay Energy	Unit 2	0.300	0.00407	5.47	0.115	180	34.7	0.75	2.9	0.00047	0.00012	0.00093	0.0048
20	20--1	Fort Detrick	Unit 5	0.00324	0.00721	85.2	0.762	121	2.85	0.75	2.9	0.00047	0.00012	0.00093	0.0048
20	20--2	Fort Detrick	Unit 6	0.00771	0.00775	97.3	1.26	121	2.85	0.75	2.9	0.00047	0.00012	0.00093	0.0048
29	29	Hamot Medical Center		0.00400	0.00174	7.72	0.0879	131	2.78	0.75	2.9	0.00047	0.00012	0.00093	0.0048
36	36--1	Merck & Company, Inc.	Unit 2	0.00305	0.00156	3.71	0.0442	99.8	1.13	0.75	2.9	0.00047	0.00012	0.00093	0.0048
36	36--2	Merck & Company, Inc.	Unit 5	0.0141	0.00255	6.78	0.308	94.4	2.35	0.75	2.9	0.00047	0.00012	0.00093	0.0048
40	40	Charleston Area Medical Center, General Hospital		0.00418	0.00106	1.31	0.0153	92.7	2.07	0.75	2.9	0.00047	0.00012	0.00093	0.0048
42	42	Stericycle, Inc.		0.0132	0.00203	24.3	0.748	149	1.50	0.75	2.9	0.00047	0.00012	0.00093	0.0048
43	43	Boca Raton Community Hospital		0.0119	0.0104	67.7	0.852	121	2.85	0.75	2.9	0.00047	0.00012	0.00093	0.0048
44	44	Bethesda Memorial Hospital		0.0739	0.00960	54.3	1.21	88.3	4.62	0.75	2.9	0.00047	0.00012	0.00093	0.0048
46	46	Holy Cross Hospital		0.0504	0.0103	37.5	2.23	67.9	1.16	0.75	2.9	0.00047	0.00012	0.00093	0.0048
48	48	Memorial Regional Hospital		0.00374	0.00973	48.3	1.29	142	3.41	0.75	2.9	0.00047	0.00012	0.00093	0.0048
51	51	Lakeland Regional Medical Center		0.00244	0.00254	68.2	1.29	77.1	2.13	0.75	2.9	0.00047	0.00012	0.00093	0.0048
54	54	Bayfront Medical Center		0.00128	0.00543	46.6	0.819	140	1.25	0.75	2.9	0.00047	0.00012	0.00093	0.0048

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	Hg unit average (mg/dscm)	PM unit average (gr/dscf)	CDD/CDF unit average (ng/dscm)	TEQ unit average (ng/dscm)	NO _x unit average (ppmv)	SO ₂ unit average (ppmv)	Beyond-the-floor HCl limit (ppmv)	Beyond-the-floor CO limit (ppmv)	Beyond-the-floor Pb limit (mg/dscm)	Beyond-the-floor Cd limit (mg/dscm)	Beyond-the-floor Hg limit (mg/dscm)	Beyond-the-floor PM limit (gr/dscf)
55	55	St. Joseph's Hospital		0.00730	0.00111	66.2	1.35	123	2.52	0.75	2.9	0.00047	0.00012	0.00093	0.0048
59	59--1	Stericycle, Inc.	Unit 1	0.0389	0.00714	2.82	0.0664	121	2.85	0.75	2.9	0.00047	0.00012	0.00093	0.0048
59	59--2	Stericycle, Inc.	Unit 2	0.118	0.0102	5.48	0.0845	121	2.85	0.75	2.9	0.00047	0.00012	0.00093	0.0048
60	60--1	BMWNC, Inc.	Unit 1	0.0598	0.00504	6.10	0.149	104	7.03	0.75	2.9	0.00047	0.00012	0.00093	0.0048
65	65--1	Stericycle, Inc.	Unit 1	0.415	0.00921	1.24	0.0105	121	2.85	0.75	2.9	0.00047	0.00012	0.00093	0.0048
65	65--2	Stericycle, Inc.	Unit 2	0.377	0.00878	0.837	0.0126	121	2.85	0.75	2.9	0.00047	0.00012	0.00093	0.0048
71	71	Loyola University Medical Center		0.0183	0.0105	67.9	0.630	107	0.819	0.75	2.9	0.00047	0.00012	0.00093	0.0048
77	77	Parkview Hospital		0.00623	0.0109	7.10	0.0898	121	2.85	0.75	2.9	0.00047	0.00012	0.00093	0.0048
84	84	Mayo Clinic, Waste Management Facility		0.0445	0.0137	0.357	0.0117	176	1.45	0.75	2.9	0.00047	0.00012	0.00093	0.0048
87	87	MedCentral Health System, Mansfield Hospital		0.00898	0.00357	29.8	0.560	121	9.27	0.75	2.9	0.00047	0.00012	0.00093	0.0048
94	94	Stericycle, Inc.		0.239	0.00617	14.7	0.341	121	2.85	0.75	2.9	0.00047	0.00012	0.00093	0.0048
98	98--1	University of Texas Medical Branch		0.0482	0.0147	98.1	1.06	78.9	1.12	0.75	2.9	0.00047	0.00012	0.00093	0.0048
106	106	Stericycle, Inc.		0.375	0.00828	2.40	0.0176	121	2.85	0.75	2.9	0.00047	0.00012	0.00093	0.0048
109	109	Healthcare Environmental Services Inc.		0.129	0.00611	16.0	1.95	207	20.2	0.75	2.9	0.00047	0.00012	0.00093	0.0048
110	110	Stericycle, Inc.		0.0746	0.00449	3.37	0.0824	228	3.35	0.75	2.9	0.00047	0.00012	0.00093	0.0048
120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	0.0130	0.00702	0.498	0.00807	72.4	1.21	0.75	2.9	0.00047	0.00012	0.00093	0.0048
120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	0.00559	0.00947	0.152	0.00378	88.4	0.462	0.75	2.9	0.00047	0.00012	0.00093	0.0048
125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		0.00164	0.00323	0.380	0.00532	66.9	1.45	0.75	2.9	0.00047	0.00012	0.00093	0.0048

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	Hg unit average (mg/dscm)	PM unit average (gr/dscf)	CDD/CDF unit average (ng/dscm)	TEQ unit average (ng/dscm)	NO _x unit average (ppmv)	SO ₂ unit average (ppmv)	Beyond-the-floor HCl limit (ppmv)	Beyond-the-floor CO limit (ppmv)	Beyond-the-floor Pb limit (mg/dscm)	Beyond-the-floor Cd limit (mg/dscm)	Beyond-the-floor Hg limit (mg/dscm)	Beyond-the-floor PM limit (gr/dscf)
130	130	Department of Veterans Affairs Medical Center		0.00542	0.0111	0.665	0.0160	81.5	7.58	0.75	2.9	0.00047	0.00012	0.00093	0.0048
13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		0.0405	0.0126	1.06	0.0509	99.8	0.469	1.8	1.9	0.016	0.0071	0.002	0.0099
16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		0.00395	0.0294	6.98	0.151	87.9	2.88	1.8	1.9	0.016	0.0071	0.002	0.0099
18	18	Franklin Square Hospital Center		0.00270	0.0256	91.4	0.996	84.7	10.9	1.8	1.9	0.016	0.0071	0.002	0.0099
21	21	Washington County Hospital		0.000836	0.0197	76.2	1.32	105	3.52	1.8	1.9	0.016	0.0071	0.002	0.0099
25	25	Holy Spirit Hospital		0.00346	0.0164	3.47	0.0299	105	3.52	1.8	1.9	0.016	0.0071	0.002	0.0099
30	30	Riddle Memorial Hospital		0.0108	0.0124	78.2	1.42	124	0.336	1.8	1.9	0.016	0.0071	0.002	0.0099
34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		0.00124	0.0239	0.0973	0.00291	105	1.22	1.8	1.9	0.016	0.0071	0.002	0.0099
38	38	Wilkes-Barre General Hospital		0.00927	0.00399	16.3	0.193	105	1.90	1.8	1.9	0.016	0.0071	0.002	0.0099
41	41	Thomas Memorial Hospital		0.109	0.0261	0.175	0.00424	94.4	2.46	1.8	1.9	0.016	0.0071	0.002	0.0099
47	47	Malcolm Randall Veterans Affairs Medical Center		0.0195	0.0173	4.48	0.111	148	2.54	1.8	1.9	0.016	0.0071	0.002	0.0099
63	63	St. Jude Children's Research Hospital		0.00361	0.00505	9.11	0.160	131	2.02	1.8	1.9	0.016	0.0071	0.002	0.0099
81	81	South Bend Medical Foundation		0.206	0.01159	4.10	0.0409	15.0	11.7	1.8	1.9	0.016	0.0071	0.002	0.0099
82	82	Good Samaritan Hospital		0.00251	0.0137	27.9	0.0967	105	3.52	1.8	1.9	0.016	0.0071	0.002	0.0099
88	88	Medina General Hospital		0.00716	0.0267	17.2	0.458	105	3.52	1.8	1.9	0.016	0.0071	0.002	0.0099
95	95	St. Joseph's Hospital		0.00254	0.00294	1.28	0.0457	105	1.96	1.8	1.9	0.016	0.0071	0.002	0.0099
108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	0.00312	0.0216	0.206	0.00300	128	0.932	1.8	1.9	0.016	0.0071	0.002	0.0099
111	111	Wyoming Medical Center		0.0237	0.00336	74.0	1.12	141	1.80	1.8	1.9	0.016	0.0071	0.002	0.0099
86	86	Fairfield Medical Center		0.0114	0.0137	2.89	0.0624	105	3.52	1.8	1.9	0.016	0.0071	0.002	0.0099
129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	0.00292	0.00760	2.89	0.00453	105	3.52	1.8	1.9	0.016	0.0071	0.002	0.0099
115	115	Kona Community Hospital		0.00158	0.0128	29.6	0.618	95	3.52	4.5	8.2	0.18	0.012	0.0040	0.017
116	116	Yukon-Kuskokwim Delta Regional Hospital		0.0906	0.0162	125	2.52	95.1	22.6	4.5	8.2	0.18	0.012	0.0040	0.017

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	Hg unit average (mg/dscm)	PM unit average (gr/dscf)	CDD/CDF unit average (ng/dscm)	TEQ unit average (ng/dscm)	NO _x unit average (ppmvd)	SO ₂ unit average (ppmvd)	Beyond-the-floor HCl limit (ppmvd)	Beyond-the-floor CO limit (ppmvd)	Beyond-the-floor Pb limit (mg/dscm)	Beyond-the-floor Cd limit (mg/dscm)	Beyond-the-floor Hg limit (mg/dscm)	Beyond-the-floor PM limit (gr/dscf)
Total large															
Total medium															
Total small															
Total small rural															
Total nationwide															

Note:
Assume incinerators operating at 2/3 of capacity.

Key:
 Emissions data unavailable; used average emissions data from similar unit

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	Beyond-the-floor CDD/CDF limit (ng/dscm)	Beyond-the-floor TEQ limit (ng/dscm)	Beyond-the-floor NO _x limit (ppmv)	Beyond-the-floor SO ₂ limit (ppmv)	Meets HCl Limit	Meets CO Limit	Meets Pb Limit	Meets Cd Limit	Meets Hg Limit	Meets PM Limit	Meets CDD/CDF Limit (Total or TEQ)	Meets NO _x Limit	Meets SO ₂ Limit
55	55	St. Joseph's Hospital		0.6	0.014	110	1.9	1	1	1	1	1	0	1	1	1
59	59--1	Stericycle, Inc.	Unit 1	0.6	0.014	110	1.9	1	1	1	1	1	1	1	1	1
59	59--2	Stericycle, Inc.	Unit 2	0.6	0.014	110	1.9	1	1	1	1	1	1	1	1	1
60	60--1	BMWNC, Inc.	Unit 1	0.6	0.014	110	1.9	1	1	1	1	1	1	1	0	1
65	65--1	Stericycle, Inc.	Unit 1	0.6	0.014	110	1.9	1	1	1	1	1	1	0	1	1
65	65--2	Stericycle, Inc.	Unit 2	0.6	0.014	110	1.9	1	1	1	1	1	1	0	1	1
71	71	Loyola University Medical Center		0.6	0.014	110	1.9	1	1	1	1	1	1	1	0	0
77	77	Parkview Hospital		0.6	0.014	110	1.9	1	1	1	1	1	1	1	1	1
84	84	Mayo Clinic, Waste Management Facility		0.6	0.014	110	1.9	1	0	1	1	1	1	0	1	0
87	87	MedCentral Health System, Mansfield Hospital		0.6	0.014	110	1.9	1	1	1	1	1	0	1	1	1
94	94	Stericycle, Inc.		0.6	0.014	110	1.9	0	1	1	1	1	1	1	1	1
98	98--1	University of Texas Medical Branch		0.6	0.014	110	1.9	1	0	1	1	1	1	1	0	0
106	106	Stericycle, Inc.		0.6	0.014	110	1.9	0	1	1	1	1	1	1	1	1
109	109	Healthcare Environmental Services Inc.		0.6	0.014	110	1.9	1	1	1	1	1	1	1	1	1
110	110	Stericycle, Inc.		0.6	0.014	110	1.9	1	1	1	1	1	0	1	1	1
120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	0.6	0.014	110	1.9	1	1	1	1	1	1	0	0	0
120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	0.6	0.014	110	1.9	1	0	1	1	1	1	0	0	0
125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		0.6	0.014	110	1.9	1	1	0	0	1	0	0	0	0

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	Beyond-the-floor CDD/CDF limit (ng/dscm)	Beyond-the-floor TEQ limit (ng/dscm)	Beyond-the-floor NO _x limit (ppmvd)	Beyond-the-floor SO ₂ limit (ppmvd)	Meets HCl Limit	Meets CO Limit	Meets Pb Limit	Meets Cd Limit	Meets Hg Limit	Meets PM Limit	Meets CDD/CDF Limit (Total or TEQ)	Meets NO _x Limit	Meets SO ₂ Limit
130	130	Department of Veterans Affairs Medical Center		0.6	0.014	110	1.9	1	0	1	1	1	1	1	0	1
13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		0.35	0.0097	38	0.78	0	0	1	1	1	1	1	1	0
16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		0.35	0.0097	38	0.78	0	1	1	1	1	1	1	1	1
18	18	Franklin Square Hospital Center		0.35	0.0097	38	0.78	0	1	1	1	1	1	1	1	1
21	21	Washington County Hospital		0.35	0.0097	38	0.78	1	1	1	1	0	1	1	1	1
25	25	Holy Spirit Hospital		0.35	0.0097	38	0.78	0	0	1	1	1	1	1	1	1
30	30	Riddle Memorial Hospital		0.35	0.0097	38	0.78	1	0	1	0	1	1	1	1	0
34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		0.35	0.0097	38	0.78	0	1	1	0	0	1	0	1	1
38	38	Wilkes-Barre General Hospital		0.35	0.0097	38	0.78	1	1	0	0	1	0	1	1	1
41	41	Thomas Memorial Hospital		0.35	0.0097	38	0.78	1	0	1	1	1	1	0	1	1
47	47	Malcolm Randall Veterans Affairs Medical Center		0.35	0.0097	38	0.78	1	1	1	1	1	1	1	1	1
63	63	St. Jude Children's Research Hospital		0.35	0.0097	38	0.78	1	0	0	0	1	0	1	1	1
81	81	South Bend Medical Foundation		0.35	0.0097	38	0.78	1	1	1	0	1	1	1	0	1
82	82	Good Samaritan Hospital		0.35	0.0097	38	0.78	0	1	1	0	1	1	1	1	1
88	88	Medina General Hospital		0.35	0.0097	38	0.78	1	1	1	1	1	1	1	1	1
95	95	St. Joseph's Hospital		0.35	0.0097	38	0.78	1	1	0	0	1	0	1	1	1
108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	0.35	0.0097	38	0.78	0	1	1	1	1	1	0	1	1
111	111	Wyoming Medical Center		0.35	0.0097	38	0.78	0	1	1	1	1	0	1	1	1
86	86	Fairfield Medical Center		0.35	0.008	38	0.78	0	1	1	0	1	1	1	1	1
129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	0.35	0.008	38	0.78	0	1	1	0	1	0	0	1	1
115	115	Kona Community Hospital		8.3	0.008	38	0.78	1	0	1	1	0	0	1	1	1
116	116	Yukon-Kuskokwim Delta Regional Hospital		8.3	0.008	38	0.78	1	0	1	1	1	0	1	1	1

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	Beyond-the-floor CDD/CDF limit (ng/dscm)	Beyond-the-floor TEQ limit (ng/dscm)	Beyond-the-floor NO _x limit (ppmvd)	Beyond-the-floor SO ₂ limit (ppmvd)	Meets HCl Limit	Meets CO Limit	Meets Pb Limit	Meets Cd Limit	Meets Hg Limit	Meets PM Limit	Meets CDD/CDF Limit (Total or TEQ)	Meets NO _x Limit	Meets SO ₂ Limit
Total large																
Total medium																
Total small																
Total small rural																
Total nationwide																

Note:
Assume incinerators operating at 2/3 of capacity.

Key:
 Emissions data unavailable; used average emissions data from similar unit

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	HCl % Improvement Needed	MACT floor HCl control	Beyond-the-floor HCl control	CO % Improvement Needed	MACT floor CO control	Beyond-the-floor CO control	Pb % Improvement Needed	MACT floor Pb control	Beyond-the-floor Pb control
1	1	Bristol-Myers Squibb Co.		8654%	add packed-bed scrubber	add caustic	-66%	none	no additional control	67719%	replace FF	improve FF performance
5	5	Merck & Company, Inc.		4.1%	none	increase lime	-51%	none	no additional control	3195%	improve FF performance	replace FF
15	15--1	Curtis Bay Energy	Unit 1	11260%	add packed-bed scrubber	add caustic	-57%	none	no additional control	971%	none	replace FF
15	15--2	Curtis Bay Energy	Unit 2	10152%	add packed-bed scrubber	add caustic	0.5%	none	minor adjustment (marginal difference in CO)	1536%	none	replace FF
20	20--1	Fort Detrick	Unit 5	-75%	none	no additional control	-70%	none	no additional control	26778%	add FF	improve FF performance
20	20--2	Fort Detrick	Unit 6	-53%	none	no additional control	-60%	none	no additional control	38658%	add FF	improve FF performance
29	29	Hamot Medical Center		2114%	add packed-bed scrubber	add caustic	-10%	none	no additional control	1337%	none	replace FF
36	36--1	Merck & Company, Inc.	Unit 2	463%	add packed-bed scrubber	add caustic	-15%	none	no additional control	144%	none	replace FF
36	36--2	Merck & Company, Inc.	Unit 5	400%	add packed-bed scrubber	add caustic	-63%	none	no additional control	2221%	none	replace FF
40	40	Charleston Area Medical Center, General Hospital		3452%	add packed-bed scrubber	add caustic	290%	increase natural gas	add more natural gas	896%	none	replace FF
42	42	Stericycle, Inc.		3520%	add packed-bed scrubber	add caustic	270%	secondary chamber retrofit	add natural gas	9130%	replace FF	improve FF performance
43	43	Boca Raton Community Hospital		31%	none	add caustic	123%	secondary chamber retrofit	add natural gas	18691%	add FF	improve FF performance
44	44	Bethesda Memorial Hospital		-19%	none	no additional control	-5.4%	none	no additional control	16370%	add FF	improve FF performance
46	46	Holy Cross Hospital		57%	none	add caustic	69%	increase natural gas	secondary chamber retrofit	13050%	add FF	improve FF performance
48	48	Memorial Regional Hospital		36%	none	add caustic	-60%	none	no additional control	19643%	add FF	improve FF performance
51	51	Lakeland Regional Medical Center		258%	increase lime	add packed-bed scrubber	119%	secondary chamber retrofit	add natural gas	7306%	replace FF	improve FF performance
54	54	Bayfront Medical Center		26%	none	add caustic	223%	secondary chamber retrofit	add natural gas	20674%	add FF	improve FF performance

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	HCl % Improvement Needed	MACT floor HCl control	Beyond-the-floor HCl control	CO % Improvement Needed	MACT floor CO control	Beyond-the-floor CO control	Pb % Improvement Needed	MACT floor Pb control	Beyond-the-floor Pb control
55	55	St. Joseph's Hospital		1571%	add packed-bed scrubber	add caustic	102%	increase natural gas	secondary chamber retrofit	15646%	replace FF	improve FF performance
59	59--1	Stericycle, Inc.	Unit 1	465%	add caustic	add caustic	36%	increase natural gas	add more natural gas	43645%	add FF	improve FF performance
59	59--2	Stericycle, Inc.	Unit 2	417%	add caustic	add caustic	59%	increase natural gas	add more natural gas	43681%	add FF	improve FF performance
60	60--1	BMWNC, Inc.	Unit 1	5072%	add packed-bed scrubber	add caustic	420%	secondary chamber retrofit	add natural gas	612%	none	replace FF
65	65--1	Stericycle, Inc.	Unit 1	50%	none	add caustic	345%	secondary chamber retrofit	add natural gas	42549%	add FF	improve FF performance
65	65--2	Stericycle, Inc.	Unit 2	91%	none	add caustic	99%	increase natural gas	secondary chamber retrofit	28512%	add FF	improve FF performance
71	71	Loyola University Medical Center		196%	none	add packed-bed scrubber	144%	secondary chamber retrofit	add natural gas	37690%	add FF	improve FF performance
77	77	Parkview Hospital		258%	increase caustic	add packed-bed scrubber	103%	increase natural gas	secondary chamber retrofit	37633%	add FF	improve FF performance
84	84	Mayo Clinic, Waste Management Facility		1933%	add packed-bed scrubber	add caustic	-23%	none	no additional control	61780%	replace FF	improve FF performance
87	87	MedCentral Health System, Mansfield Hospital		3210%	add packed-bed scrubber	add caustic	66%	increase natural gas	add more natural gas	8729%	replace FF	improve FF performance
94	94	Stericycle, Inc.		-12%	none	no additional control	53%	increase natural gas	add more natural gas	51799%	add FF	improve FF performance
98	98--1	University of Texas Medical Branch		183%	none	add caustic	-40%	none	no additional control	160721%	add FF	improve FF performance
106	106	Stericycle, Inc.		-24%	none	no additional control	59%	increase natural gas	add more natural gas	26884%	add FF	improve FF performance
109	109	Healthcare Environmental Services Inc.		9560%	add packed-bed scrubber	add caustic	408%	secondary chamber retrofit	add natural gas	3530%	replace FF	improve FF performance
110	110	Stericycle, Inc.		423%	increase sodium bicarbonate	add more sodium bicarbonate	155%	secondary chamber retrofit	add natural gas	6468%	add FF	improve FF performance
120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	1371%	add packed-bed scrubber	add caustic	37%	increase natural gas	add more natural gas	3873%	replace FF	improve FF performance
120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	607%	add packed-bed scrubber	add caustic	-1.4%	none	no additional control	1555%	none	improve FF performance
125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		110%	none	add caustic	267%	secondary chamber retrofit	add natural gas	-37%	none	no additional control

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	HCl % Improvement Needed	MACT floor HCl control	Beyond-the-floor HCl control	CO % Improvement Needed	MACT floor CO control	Beyond-the-floor CO control	Pb % Improvement Needed	MACT floor Pb control	Beyond-the-floor Pb control
130	130	Department of Veterans Affairs Medical Center		1009%	add caustic	add more caustic	-66%	none	no additional control	9151%	add FF	improve FF performance
13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		-61%	none	no additional control	-21%	none	no additional control	5980%	add FF	improve FF performance
16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		-23%	none	no additional control	521%	secondary chamber retrofit	add natural gas	1968%	add FF	improve FF performance
18	18	Franklin Square Hospital Center		-18%	none	no additional control	182%	secondary chamber retrofit	add natural gas	1537%	add FF	improve FF performance
21	21	Washington County Hospital		248%	add packed-bed scrubber	add caustic	248%	secondary chamber retrofit	add natural gas	923%	add FF	improve FF performance
25	25	Holy Spirit Hospital		-59%	none	no additional control	-1.1%	none	no additional control	869%	add FF	improve FF performance
30	30	Riddle Memorial Hospital		17%	none	add caustic	-26%	none	no additional control	1014%	add FF	improve FF performance
34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		-29%	none	no additional control	11%	none	increase natural gas	841%	add FF	improve FF performance
38	38	Wilkes-Barre General Hospital		397%	add packed-bed scrubber	add caustic	9.6%	none	increase natural gas	-75%	none	no additional control
41	41	Thomas Memorial Hospital		46%	add caustic	add more caustic	-50%	none	no additional control	4420%	add FF	improve FF performance
47	47	Malcolm Randall Veterans Affairs Medical Center		161%	add packed-bed scrubber	add caustic	510%	secondary chamber retrofit	add natural gas	1321%	add FF	improve FF performance
63	63	St. Jude Children's Research Hospital		1430%	add packed-bed scrubber	add caustic	-64%	none	no additional control	-70%	none	no additional control
81	81	South Bend Medical Foundation		584%	add packed-bed scrubber	add caustic	8.6%	none	increase natural gas	3267%	add FF	improve FF performance
82	82	Good Samaritan Hospital		-12%	none	no additional control	0.4%	none	minor adjustment (marginal difference in CO)	63%	add FF	improve FF performance
88	88	Medina General Hospital		83%	add caustic	add more caustic	640%	secondary chamber retrofit	add natural gas	4084%	add FF	improve FF performance
95	95	St. Joseph's Hospital		193%	add packed-bed scrubber	add caustic	13%	none	increase natural gas	-75%	none	no additional control
108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	-75%	none	no additional control	3.5%	none	increase natural gas	523%	add FF	improve FF performance
111	111	Wyoming Medical Center		-35%	none	no additional control	73%	increase natural gas	add more natural gas	210%	add FF	improve FF performance
86	86	Fairfield Medical Center		-43%	none	no additional control	19%	none	add natural gas	904%	none	add DIFF
129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	-28%	none	no additional control	537%	secondary chamber retrofit	add natural gas	354%	none	add DIFF
115	115	Kona Community Hospital		2890%	none	add packed-bed scrubber	-15%	none	no additional control	25%	none	add FF
116	116	Yukon-Kuskokwim Delta Regional Hospital		6523%	none	add packed-bed scrubber	-34%	none	no additional control	25%	none	improve FF performance

Table 19. Nationwide Beyond-the-Floor Costs for Existing

FACID	UNITID	Facility name	Unit number	HCl % Improvement Needed	MACT floor HCl control	Beyond-the-floor HCl control	CO % Improvement Needed	MACT floor CO control	Beyond-the-floor CO control	Pb % Improvement Needed	MACT floor Pb control	Beyond-the-floor Pb control
Total large												
Total medium												
Total small												
Total small rural												
Total nationwide												

Note:
Assume incinerators operating at 2/3 of capacity.

Key:
 Emissions data unavailable; used average emissions data from similar unit

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	Cd % Improvement Needed	MACT floor Cd control	Beyond-the-floor Cd control	Hg % Improvement Needed	MACT floor Hg control	Beyond-the-floor Hg control	PM % Improvement Needed	MACT floor PM control	Beyond-the-floor PM control
1	1	Bristol-Myers Squibb Co.		2934%	none	improve FF performance	-25%	none	no additional control	-62%	none	no additional control
5	5	Merck & Company, Inc.		2111%	none	replace FF	280%	none	increase activated carbon	-31%	none	no additional control
15	15--1	Curtis Bay Energy	Unit 1	639%	none	replace FF	18642%	add ACI	increase activated carbon	71%	improve FF performance	replace FF
15	15--2	Curtis Bay Energy	Unit 2	984%	none	replace FF	32165%	add ACI	increase activated carbon	-15%	none	no additional control
20	20--1	Fort Detrick	Unit 5	8163%	add FF	improve FF performance	249%	none	increase activated carbon	50%	add FF	improve FF performance
20	20--2	Fort Detrick	Unit 6	7123%	add FF	improve FF performance	729%	none	increase activated carbon	61%	add FF	improve FF performance
29	29	Hamot Medical Center		895%	none	replace FF	330%	none	further increase activated carbon	-64%	none	no additional control
36	36--1	Merck & Company, Inc.	Unit 2	611%	none	replace FF	228%	none	increase activated carbon	-68%	none	no additional control
36	36--2	Merck & Company, Inc.	Unit 5	1920%	none	replace FF	1419%	add ACI	increase activated carbon	-47%	none	no additional control
40	40	Charleston Area Medical Center, General Hospital		1446%	none	replace FF	349%	none	increase activated carbon	-78%	none	no additional control
42	42	Stericycle, Inc.		7281%	replace FF	improve FF performance	1321%	increase activated carbon	further increase activated carbon	-58%	none	no additional control
43	43	Boca Raton Community Hospital		4378%	add FF	improve FF performance	1175%	add ACI	increase activated carbon	117%	add FF	improve FF performance
44	44	Bethesda Memorial Hospital		7645%	add FF	improve FF performance	7846%	add ACI	increase activated carbon	100%	add FF	improve FF performance
46	46	Holy Cross Hospital		13893%	add FF	improve FF performance	5318%	add ACI	increase activated carbon	114%	add FF	improve FF performance
48	48	Memorial Regional Hospital		4570%	increase pressure drop	improve FF performance	302%	none	increase activated carbon	103%	add FF	improve FF performance
51	51	Lakeland Regional Medical Center		2940%	none	improve FF performance	162%	none	increase activated carbon	-47%	none	no additional control
54	54	Bayfront Medical Center		3062%	none	improve FF performance	37%	none	increase activated carbon	13%	none	improve FF performance

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	Cd % Improvement Needed	MACT floor Cd control	Beyond-the-floor Cd control	Hg % Improvement Needed	MACT floor Hg control	Beyond-the-floor Hg control	PM % Improvement Needed	MACT floor PM control	Beyond-the-floor PM control
55	55	St. Joseph's Hospital		1606%	none	improve FF performance	685%	none	increase activated carbon	-77%	none	no additional control
59	59--1	Stericycle, Inc.	Unit 1	19308%	add FF	improve FF performance	4080%	add ACI	increase activated carbon	49%	add FF	improve FF performance
59	59--2	Stericycle, Inc.	Unit 2	15569%	add FF	improve FF performance	12574%	add ACI	increase activated carbon	112%	add FF	improve FF performance
60	60--1	BMWNC, Inc.	Unit 1	344%	none	replace FF	6325%	increase activated carbon	further increase activated carbon	5%	none	improve FF performance
65	65--1	Stericycle, Inc.	Unit 1	4664%	add FF	improve FF performance	44485%	add ACI	increase activated carbon	92%	add FF	improve FF performance
65	65--2	Stericycle, Inc.	Unit 2	10158%	add FF	improve FF performance	40414%	add ACI	increase activated carbon	83%	add FF	improve FF performance
71	71	Loyola University Medical Center		12605%	add FF	improve FF performance	1867%	add ACI	increase activated carbon	118%	add FF	improve FF performance
77	77	Parkview Hospital		66693%	add FF	improve FF performance	569%	none	increase activated carbon	127%	add FF	improve FF performance
84	84	Mayo Clinic, Waste Management Facility		8294%	replace FF	improve FF performance	4680%	increase activated carbon	further increase activated carbon	185%	replace FF	improve FF performance
87	87	MedCentral Health System, Mansfield Hospital		844%	none	improve FF performance	866%	none	further increase activated carbon	-26%	none	no additional control
94	94	Stericycle, Inc.		4268%	add FF	improve FF performance	25635%	add ACI	increase activated carbon	29%	increase pressure drop	improve FF performance
98	98--1	University of Texas Medical Branch		2384%	none	improve FF performance	5083%	increase activated carbon	further increase activated carbon	206%	add FF	improve FF performance
106	106	Stericycle, Inc.		3201%	none	improve FF performance	40274%	add ACI	increase activated carbon	73%	add FF	improve FF performance
109	109	Healthcare Environmental Services Inc.		2363%	none	improve FF performance	13738%	increase activated carbon	further increase activated carbon	27%	improve FF performance	improve FF performance
110	110	Stericycle, Inc.		1680%	none	improve FF performance	7924%	increase activated carbon	further increase activated carbon	-6.4%	none	no additional control
120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	1003%	none	improve FF performance	1299%	increase activated carbon	further increase activated carbon	46%	replace FF	improve FF performance
120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	641%	none	improve FF performance	501%	none	increase activated carbon	97%	replace FF	improve FF performance
125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		-12%	none	no additional control	76%	none	increase activated carbon	-33%	none	no additional control

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	Cd % Improvement Needed	MACT floor Cd control	Beyond-the-floor Cd control	Hg % Improvement Needed	MACT floor Hg control	Beyond-the-floor Hg control	PM % Improvement Needed	MACT floor PM control	Beyond-the-floor PM control
130	130	Department of Veterans Affairs Medical Center		4600%	add FF	improve FF performance	483%	none	add ACI	131%	add FF	improve FF performance
13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		1622%	add FF	improve FF performance	1926%	add ACI	increase activated carbon	27%	increase pressure drop	improve FF performance
16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		565%	add FF	improve FF performance	97%	none	increase activated carbon	197%	add FF	improve FF performance
18	18	Franklin Square Hospital Center		568%	add FF	improve FF performance	35%	none	increase activated carbon	158%	add FF	improve FF performance
21	21	Washington County Hospital		95%	add FF	improve FF performance	-58%	none	no additional control	99%	add FF	improve FF performance
25	25	Holy Spirit Hospital		518%	add FF	improve FF performance	73%	none	increase activated carbon	66%	add FF	improve FF performance
30	30	Riddle Memorial Hospital		-48%	none	no additional control	438%	increase activated carbon	further increase activated carbon	25%	increase pressure drop	improve FF performance
34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		-43%	none	no additional control	-38%	none	no additional control	141%	add FF	improve FF performance
38	38	Wilkes-Barre General Hospital		-85%	none	no additional control	363%	increase activated carbon	further increase activated carbon	-60%	none	no additional control
41	41	Thomas Memorial Hospital		319%	add FF	improve FF performance	5341%	add ACI	increase activated carbon	164%	add FF	improve FF performance
47	47	Malcolm Randall Veterans Affairs Medical Center		1136%	add FF	improve FF performance	874%	add ACI	increase activated carbon	74%	add FF	improve FF performance
63	63	St. Jude Children's Research Hospital		-79%	none	no additional control	80%	none	further increase activated carbon	-49%	none	no additional control
81	81	South Bend Medical Foundation		-75%	none	no additional control	10215%	add ACI	increase activated carbon	17%	none	improve FF performance
82	82	Good Samaritan Hospital		-53%	none	no additional control	25%	none	increase activated carbon	38%	increase pressure drop	improve FF performance
88	88	Medina General Hospital		54%	add FF	improve FF performance	258%	none	increase activated carbon	170%	add FF	improve FF performance
95	95	St. Joseph's Hospital		-82%	none	no additional control	27%	none	further increase activated carbon	-70%	none	no additional control
108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	8.9%	increase pressure drop	improve FF performance	56%	none	add ACI	118%	add FF	improve FF performance
111	111	Wyoming Medical Center		156%	add FF	improve FF performance	1083%	add ACI	increase activated carbon	-66%	none	no additional control
86	86	Fairfield Medical Center		-64%	none	no additional control	472%	add ACI	increase activated carbon	38%	none	add DIFF
129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	-23%	none	no additional control	46%	none	add ACI	-23%	none	no additional control
115	115	Kona Community Hospital		216%	none	add FF	-61%	none	no additional control	-24%	none	no additional control
116	116	Yukon-Kuskokwim Delta Regional Hospital		216%	none	improve FF performance	2166%	add DIFF and ACI	increase activated carbon	-4.9%	none	no additional control

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	Cd % Improvement Needed	MACT floor Cd control	Beyond-the-floor Cd control	Hg % Improvement Needed	MACT floor Hg control	Beyond-the-floor Hg control	PM % Improvement Needed	MACT floor PM control	Beyond-the-floor PM control
Total large												
Total medium												
Total small												
Total small rural												
Total nationwide												

Note:
Assume incinerators operating at 2/3 of capacity.

Key:
Emissions data unavailable; used average emissions data from similar unit

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	Total CDD/CDF % Improvement Needed	MACT floor CDD/CDF control	Beyond-the-floor CDD/CDF control	CDD/CDF TEQ % Improvement Needed	MACT floor TEQ control	Beyond-the-floor TEQ control	NO _x % Improvement Needed	MACT floor NO _x control
1	1	Bristol-Myers Squibb Co.		6045%	add ACI	increase activated carbon	4609%	add ACI	increase activated carbon	8.3%	none
5	5	Merck & Company, Inc.		2037%	add ACI	increase activated carbon	684%	add ACI	increase activated carbon	2.2%	none
15	15--1	Curtis Bay Energy	Unit 1	4512%	add ACI	increase activated carbon	3119%	add ACI	increase activated carbon	70%	add SNCR
15	15--2	Curtis Bay Energy	Unit 2	812%	add ACI	increase activated carbon	722%	add ACI	increase activated carbon	63%	add SNCR
20	20--1	Fort Detrick	Unit 5	14094%	add ACI	increase activated carbon	5345%	add ACI	increase activated carbon	9.6%	none
20	20--2	Fort Detrick	Unit 6	16115%	add ACI	increase activated carbon	8922%	add ACI	increase activated carbon	9.6%	none
29	29	Hamot Medical Center		1187%	increase activated carbon	further increase activated carbon	528%	increase activated carbon	further increase activated carbon	19%	none
36	36--1	Merck & Company, Inc.	Unit 2	518%	add ACI	increase activated carbon	216%	add ACI	increase activated carbon	-9.3%	none
36	36--2	Merck & Company, Inc.	Unit 5	1030%	add ACI	increase activated carbon	2098%	add ACI	increase activated carbon	-14%	none
40	40	Charleston Area Medical Center, General Hospital		119%	none	increase activated carbon	9.3%	none	increase activated carbon	-16%	none
42	42	Stericycle, Inc.		3945%	increase activated carbon	further increase activated carbon	5240%	increase activated carbon	further increase activated carbon	36%	minor adjustment (marginal difference in NO _x)
43	43	Boca Raton Community Hospital		11189%	add ACI	increase activated carbon	5986%	add ACI	increase activated carbon	9.6%	none
44	44	Bethesda Memorial Hospital		8946%	add ACI	increase activated carbon	8514%	add ACI	increase activated carbon	-20%	none
46	46	Holy Cross Hospital		6157%	add ACI	increase activated carbon	15793%	add ACI	increase activated carbon	-38%	none
48	48	Memorial Regional Hospital		7957%	add ACI	increase activated carbon	9107%	add ACI	increase activated carbon	29%	minor adjustment (marginal difference in NO _x)
51	51	Lakeland Regional Medical Center		11269%	add ACI	increase activated carbon	9110%	add ACI	increase activated carbon	-30%	none
54	54	Bayfront Medical Center		7659%	add ACI	increase activated carbon	5753%	add ACI	increase activated carbon	28%	minor adjustment (marginal difference in NO _x)

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	Total CDD/CDF % Improvement Needed	MACT floor CDD/CDF control	Beyond-the-floor CDD/CDF control	CDD/CDF TEQ % Improvement Needed	MACT floor TEQ control	Beyond-the-floor TEQ control	NO _x % Improvement Needed	MACT floor NO _x control
55	55	St. Joseph's Hospital		10927%	add ACI	increase activated carbon	9548%	add ACI	increase activated carbon	12%	none
59	59--1	Stericycle, Inc.	Unit 1	369%	add ACI	increase activated carbon	374%	add ACI	increase activated carbon	9.6%	none
59	59--2	Stericycle, Inc.	Unit 2	814%	add ACI	increase activated carbon	503%	add ACI	increase activated carbon	9.6%	none
60	60--1	BMWNC, Inc.	Unit 1	916%	increase activated carbon	further increase activated carbon	963%	increase activated carbon	further increase activated carbon	-5.8%	none
65	65--1	Stericycle, Inc.	Unit 1	106%	none	no additional control (meets TEQ)	-25%	none	no additional control	9.6%	none
65	65--2	Stericycle, Inc.	Unit 2	40%	none	no additional control (meets TEQ)	-9.9%	none	no additional control	9.6%	none
71	71	Loyola University Medical Center		11218%	add ACI	increase activated carbon	4402%	add ACI	increase activated carbon	-3.1%	none
77	77	Parkview Hospital		1083%	add ACI	increase activated carbon	541%	add ACI	increase activated carbon	9.6%	none
84	84	Mayo Clinic, Waste Management Facility		-41%	none	no additional control	-17%	none	no additional control	60%	add SNCR
87	87	MedCentral Health System, Mansfield Hospital		4868%	increase activated carbon	further increase activated carbon	3902%	increase activated carbon	further increase activated carbon	9.6%	none
94	94	Stericycle, Inc.		2356%	add ACI	increase activated carbon	2339%	add ACI	increase activated carbon	9.6%	none
98	98--1	University of Texas Medical Branch		16256%	increase activated carbon	further increase activated carbon	7443%	increase activated carbon	further increase activated carbon	-28%	none
106	106	Stericycle, Inc.		300%	none (meets TEQ)	increase activated carbon	26%	none	increase activated carbon	9.6%	none
109	109	Healthcare Environmental Services Inc.		2567%	increase activated carbon	further increase activated carbon	13842%	increase activated carbon	further increase activated carbon	88%	add SNCR
110	110	Stericycle, Inc.		461%	increase activated carbon	further increase activated carbon	489%	increase activated carbon	further increase activated carbon	107%	add SNCR
120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	-17%	none	no additional control	-42%	none	no additional control	-34%	none
120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	-75%	none	no additional control	-73%	none	no additional control	-20%	none
125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		-37%	none	no additional control	-62%	none	no additional control	-39%	none

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	Total CDD/CDF % Improvement Needed	MACT floor CDD/CDF control	Beyond-the-floor CDD/CDF control	CDD/CDF TEQ % Improvement Needed	MACT floor TEQ control	Beyond-the-floor TEQ control	NO _x % Improvement Needed	MACT floor NO _x control
130	130	Department of Veterans Affairs Medical Center		11%	none	add ACI	14%	none	add ACI	-26%	none
13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		203%	add ACI	increase activated carbon	425%	add ACI	increase activated carbon	163%	none
16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		1895%	add ACI	increase activated carbon	1456%	add ACI	increase activated carbon	131%	none
18	18	Franklin Square Hospital Center		26002%	add ACI	increase activated carbon	10163%	add ACI	increase activated carbon	123%	none
21	21	Washington County Hospital		21669%	add ACI	increase activated carbon	13471%	add ACI	increase activated carbon	177%	none
25	25	Holy Spirit Hospital		893%	add ACI	increase activated carbon	209%	add ACI	increase activated carbon	177%	none
30	30	Riddle Memorial Hospital		22253%	increase activated carbon	further increase activated carbon	14500%	increase activated carbon	further increase activated carbon	227%	none
34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		-72%	none	no additional control	-70%	none	no additional control	177%	none
38	38	Wilkes-Barre General Hospital		4557%	increase activated carbon	further increase activated carbon	1885%	increase activated carbon	further increase activated carbon	177%	none
41	41	Thomas Memorial Hospital		-50%	none	no additional control	-56%	none	no additional control	148%	none
47	47	Malcolm Randall Veterans Affairs Medical Center		1181%	add ACI	increase activated carbon	1040%	add ACI	increase activated carbon	290%	none
63	63	St. Jude Children's Research Hospital		2502%	increase activated carbon	further increase activated carbon	1549%	increase activated carbon	further increase activated carbon	244%	none
81	81	South Bend Medical Foundation		1072%	add ACI	increase activated carbon	322%	add ACI	increase activated carbon	-61%	none
82	82	Good Samaritan Hospital		7863%	add ACI	increase activated carbon	897%	add ACI	increase activated carbon	177%	none
88	88	Medina General Hospital		4827%	add ACI	increase activated carbon	4621%	add ACI	increase activated carbon	177%	none
95	95	St. Joseph's Hospital		265%	increase activated carbon	further increase activated carbon	371%	increase activated carbon	further increase activated carbon	177%	none
108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	-41%	none	no additional control	-69%	none	no additional control	236%	none
111	111	Wyoming Medical Center		21042%	add ACI	increase activated carbon	11401%	add ACI	increase activated carbon	270%	none
86	86	Fairfield Medical Center		725%	none	increase activated carbon	680%	none (meets total CDD/CDF)	increase activated carbon	177%	none
129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	725%	none	none (meets TEQ)	-43%	none	no additional control	177%	none
115	115	Kona Community Hospital		256%	none	add ACI and DIFF	7626%	none	add ACI and DIFF	150%	none
116	116	Yukon-Kuskokwim Delta Regional Hospital		1405%	none	increase activated carbon	31356%	none	increase activated carbon	150%	none

Table 19. Nationwide Beyond-the-Floor Costs for Existing

FACID	UNITID	Facility name	Unit number	Total CDD/CDF % Improvement Needed	MACT floor CDD/CDF control	Beyond-the-floor CDD/CDF control	CDD/CDF TEQ % Improvement Needed	MACT floor TEQ control	Beyond-the-floor TEQ control	NO _x % Improvement Needed	MACT floor NO _x control
Total large											
Total medium											
Total small											
Total small rural											
Total nationwide											

Note:
Assume incinerators operating at 2/3 of capacity.

Key:
 Emissions data unavailable; used average emissions data from similar unit

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	Beyond-the-floor NO _x control	SO ₂ % Improvement Needed	MACT floor SO ₂ control	Beyond-the-floor SO ₂ control	Consolidated MACT floor controls	APCD code with MACT floor controls
1	1	Bristol-Myers Squibb Co.		add SNCR	1474%	add packed-bed scrubber	add caustic	replace FF with DIFF; add packed-bed scrubber and ACI	FF/WS
5	5	Merck & Company, Inc.		add SNCR	43%	none	add packed-bed scrubber	improve FF performance, add ACI	DIFF
15	15--1	Curtis Bay Energy	Unit 1	increase NO _x reagent	1109%	add packed-bed scrubber	add caustic	improve FF performance; add packed-bed scrubber, ACI, and SNCR	DIFF/WS
15	15--2	Curtis Bay Energy	Unit 2	increase NO _x reagent	1729%	add packed-bed scrubber	add caustic	add packed-bed scrubber, ACI, and SNCR	DIFF/WS
20	20--1	Fort Detrick	Unit 5	add SNCR	50%	add caustic	add more caustic	add DIFF, caustic, and ACI	DIFF/WS
20	20--2	Fort Detrick	Unit 6	add SNCR	50%	add caustic	add more caustic	add DIFF, caustic, and ACI	DIFF/WS
29	29	Hamot Medical Center		add SNCR	46%	none	add caustic	add packed-bed scrubber; increase activated carbon	DIFF/WS
36	36--1	Merck & Company, Inc.	Unit 2	add SNCR	-41%	none	no additional control	add packed-bed scrubber and ACI	DIFF/WS
36	36--2	Merck & Company, Inc.	Unit 5	add SNCR	24%	none	add caustic	add packed-bed scrubber and ACI	DIFF/WS
40	40	Charleston Area Medical Center, General Hospital		add SNCR	9.0%	none	add caustic	increase natural gas; add packed-bed scrubber	DIFF/WS
42	42	Stericycle, Inc.		add SNCR	-21%	none	no additional control	secondary chamber retrofit; replace DIFF; add packed-bed scrubber; increase activated carbon; only minor adjustment of system to obtain additional NO _x control (marginal difference in NO _x)	DIFF/WS
43	43	Boca Raton Community Hospital		add SNCR	50%	add caustic	add more caustic	secondary chamber retrofit; add DIFF, caustic, and ACI	DIFF/WS
44	44	Bethesda Memorial Hospital		add SNCR	143%	add caustic	add more caustic	add DIFF, caustic, and ACI	DIFF/WS
46	46	Holy Cross Hospital		add SNCR	-39%	none	no additional control	increase natural gas; add DIFF and ACI	DIFF/WS
48	48	Memorial Regional Hospital		add SNCR	79%	add caustic	add more caustic	add DIFF, caustic, and ACI; only minor adjustment of system to obtain additional NO _x control (marginal difference in NO _x)	DIFF/WS
51	51	Lakeland Regional Medical Center		add SNCR	12%	none	increase lime	secondary chamber retrofit; replace DIFF; increase lime; add ACI	DIFF
54	54	Bayfront Medical Center		add SNCR	-34%	none	no additional control	secondary chamber retrofit; add DIFF and ACI; only minor adjustment of system needed to obtain additional NO _x control (marginal difference in NO _x)	DIFF/WS

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	Beyond-the-floor NO _x control	SO ₂ % Improvement Needed	MACT floor SO ₂ control	Beyond-the-floor SO ₂ control	Consolidated MACT floor controls	APCD code with MACT floor controls
55	55	St. Joseph's Hospital		add SNCR	33%	none	add caustic	increase natural gas, replace DIFF; add packed-bed scrubber and ACI	DIFF/WS
59	59--1	Stericycle, Inc.	Unit 1	add SNCR	50%	add caustic	add more caustic	increase natural gas; add DIFF, caustic, and ACI	DIFF/WS
59	59--2	Stericycle, Inc.	Unit 2	add SNCR	50%	add caustic	add more caustic	increase natural gas; add DIFF, caustic, and ACI	DIFF/WS
60	60--1	BMWNC, Inc.	Unit 1	add SNCR	270%	add packed-bed scrubber	add caustic	secondary chamber retrofit; add packed-bed scrubber; increase activated carbon	DIFF/WS
65	65--1	Stericycle, Inc.	Unit 1	add SNCR	50%	add caustic	add more caustic	secondary chamber retrofit; add DIFF, caustic, and ACI	DIFF/WS
65	65--2	Stericycle, Inc.	Unit 2	add SNCR	50%	add caustic	add more caustic	increase natural gas; add DIFF, caustic, and ACI	DIFF/WS
71	71	Loyola University Medical Center		add SNCR	-57%	none	no additional control	secondary chamber retrofit; add DIFF and ACI	DIFF/WS
77	77	Parkview Hospital		add SNCR	50%	add caustic	add more caustic	increase natural gas; add DIFF, caustic, and ACI	DIFF/WS
84	84	Mayo Clinic, Waste Management Facility		increase NO _x reagent	-24%	none	no additional control	replace DIFF; add packed-bed scrubber; increase activated carbon; add SNCR	DIFF/WS
87	87	MedCentral Health System, Mansfield Hospital		add SNCR	388%	add packed-bed scrubber	add caustic	increase natural gas; replace DIFF; add packed-bed scrubber; increase activated carbon	DIFF/WS
94	94	Stericycle, Inc.		add SNCR	50%	add caustic	add more caustic	increase natural gas; add DIFF, caustic, and ACI	DIFF/WS
98	98--1	University of Texas Medical Branch		add SNCR	-41%	none	no additional control	add DIFF and ACI	DIFF/WS
106	106	Stericycle, Inc.		add SNCR	50%	add caustic	add more caustic	increase natural gas; add DIFF, caustic, and ACI	DIFF/WS
109	109	Healthcare Environmental Services Inc.		increase NO _x reagent	961%	add packed-bed scrubber	add caustic	secondary chamber retrofit; replace DIFF; add packed-bed scrubber and SNCR; increase activated carbon	DIFF/WS
110	110	Stericycle, Inc.		increase NO _x reagent	76%	increase sodium bicarbonate	add more sodium bicarbonate	secondary chamber retrofit; add FF; increase sodium bicarbonate and activated carbon; add SNCR	DIFF-ESP/WS
120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	add SNCR	-36%	none	no additional control	increase natural gas; replace DIFF; add packed-bed scrubber; increase activated carbon	DIFF/WS
120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	add SNCR	-76%	none	no additional control	replace DIFF; add packed-bed scrubber	DIFF/WS
125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		add SNCR	-24%	none	no additional control	secondary chamber retrofit	CA/WS

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	Beyond-the-floor NO _x control	SO ₂ % Improvement Needed	MACT floor SO ₂ control	Beyond-the-floor SO ₂ control	Consolidated MACT floor controls	APCD code with MACT floor controls
130	130	Department of Veterans Affairs Medical Center		add SNCR	299%	add caustic	add more caustic	add DIFF and caustic	DIFF/WS
13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		add SNCR	-40%	none	no additional control	add DIFF and ACI	DIFF/WS
16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		add SNCR	269%	add caustic	add more caustic	secondary chamber retrofit; add DIFF, caustic, and ACI	DIFF/WS
18	18	Franklin Square Hospital Center		add SNCR	1294%	add caustic	add caustic	secondary chamber retrofit; add DIFF, packed-bed scrubber, and ACI	DIFF/WS
21	21	Washington County Hospital		add SNCR	351%	add packed-bed scrubber	add caustic	secondary chamber retrofit; add DIFF, packed-bed scrubber, and ACI	DIFF/WS
25	25	Holy Spirit Hospital		add SNCR	351%	add caustic	add more caustic	add DIFF, caustic, and ACI	DIFF/WS
30	30	Riddle Memorial Hospital		add SNCR	-57%	none	no additional control	add DIFF and ACI	DIFF/WS
34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		add SNCR	56%	none	add packed-bed scrubber	add FF	FF/WS
38	38	Wilkes-Barre General Hospital		add SNCR	143%	none	add caustic	add packed-bed scrubber; increase activated carbon	DIFF/WS
41	41	Thomas Memorial Hospital		add SNCR	215%	none	add caustic	add DIFF, caustic, and ACI	DIFF/WS
47	47	Malcolm Randall Veterans Affairs Medical Center		add SNCR	225%	none	add caustic	secondary chamber retrofit; add DIFF, packed-bed scrubber, and ACI	DIFF/WS
63	63	St. Jude Children's Research Hospital		add SNCR	159%	none	add caustic	add packed-bed scrubber; increase activated carbon	DIFF/WS
81	81	South Bend Medical Foundation		add SNCR	1395%	add packed-bed scrubber	add caustic	add DIFF, packed-bed scrubber, and ACI	DIFF/WS
82	82	Good Samaritan Hospital		add SNCR	351%	add caustic	add more caustic	add DIFF, caustic, and ACI	DIFF/WS
88	88	Medina General Hospital		add SNCR	351%	add caustic	add more caustic	secondary chamber retrofit; add DIFF, caustic, and ACI	DIFF/WS
95	95	St. Joseph's Hospital		add SNCR	151%	none	add caustic	add packed-bed scrubber; increase activated carbon	DIFF/WS
108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	add SNCR	20%	none	add caustic	add FF	FF/WS
111	111	Wyoming Medical Center		add SNCR	131%	none	add caustic	increase natural gas; add DIFF and ACI	DIFF/WS
86	86	Fairfield Medical Center		add SNCR	351%	add caustic	add more caustic	add caustic and ACI	WS
129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	add SNCR	351%	add caustic	add more caustic	secondary chamber retrofit, add caustic	WS
115	115	Kona Community Hospital		add SNCR	351%	none	add caustic	none	CC
116	116	Yukon-Kuskokwim Delta Regional Hospital		add SNCR	2793%	none	add packed-bed scrubber	add DIFF and ACI	DIFF

Table 19. Nationwide Beyond-the-Floor Costs for Existing

FACID	UNITID	Facility name	Unit number	Beyond-the-floor NO _x control	SO ₂ % Improvement Needed	MACT floor SO ₂ control	Beyond-the-floor SO ₂ control	Consolidated MACT floor controls	APCD code with MACT floor controls
Total large									
Total medium									
Total small									
Total small rural									
Total nationwide									

Note:
Assume incinerators operating at 2/3 of capacity.

Key:
 Emissions data unavailable; used average emissions data from similar unit

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	Consolidated beyond-the-floor controls	APCD code with MACT floor and BTF controls	Packed-bed scrubber	DIFF	Secondary chamber retrofit	SNCR	ACI	Improve FF performance	Increase carbon
1	1	Bristol-Myers Squibb Co.		improve FF performance; add caustic; increase activated carbon; add SNCR	FF/WS				\$27,990		\$3,547	\$17,550
5	5	Merck & Company, Inc.		replace DIFF (in place of improving FF performance); add packed-bed scrubber; increase activated carbon; add SNCR	DIFF/WS	\$191,179	\$621,549		\$124,730			\$78,207
15	15--1	Curtis Bay Energy	Unit 1	replace DIFF (in place of improving FF performance); add caustic; increase activated carbon and NO _x reagent	DIFF/WS		\$2,343,587					\$294,883
15	15--2	Curtis Bay Energy	Unit 2	minor adjustment of system to obtain additional CO control (marginal difference in CO); replace DIFF; add caustic; increase activated carbon and NO _x reagent	DIFF/WS		\$2,653,081					\$325,545
20	20--1	Fort Detrick	Unit 5	improve FF performance; add more caustic; increase activated carbon; add SNCR	DIFF/WS				\$41,158		\$5,216	\$25,806
20	20--2	Fort Detrick	Unit 6	improve FF performance; add more caustic; increase activated carbon; add SNCR	DIFF/WS				\$39,192		\$4,967	\$24,574
29	29	Hamot Medical Center		replace DIFF; add caustic; further increase activated carbon; add SNCR	DIFF/WS		\$321,097		\$62,838			\$39,400
36	36--1	Merck & Company, Inc.	Unit 2	replace DIFF; add caustic; increase activated carbon; add SNCR	DIFF/WS		\$454,215		\$88,889			\$55,734
36	36--2	Merck & Company, Inc.	Unit 5	replace DIFF; add caustic; increase activated carbon; add SNCR	DIFF/WS		\$704,471		\$137,864			\$86,442
40	40	Charleston Area Medical Center, General Hospital		add more natural gas; replace DIFF; add caustic; increase activated carbon; add SNCR	DIFF/WS		\$375,101		\$73,407			\$46,027
42	42	Stericycle, Inc.		add natural gas; improve FF performance; add caustic; further increase activated carbon; add SNCR (in place of minor adjustment of system)	DIFF/WS				\$118,985		\$15,080	\$74,605
43	43	Boca Raton Community Hospital		add natural gas; improve FF performance; add more caustic; increase activated carbon; add SNCR	DIFF/WS				\$35,275		\$4,471	\$22,118
44	44	Bethesda Memorial Hospital		improve FF performance; add more caustic; increase activated carbon; add SNCR	DIFF/WS				\$77,035		\$9,763	\$48,302
46	46	Holy Cross Hospital		secondary chamber retrofit (in place of increasing natural gas); improve FF performance; add caustic; increase activated carbon; add SNCR	DIFF/WS			\$42,745	\$57,361		\$7,270	\$35,966
48	48	Memorial Regional Hospital		improve FF performance; add more caustic; increase activated carbon; add SNCR (in place of minor adjustment of system)	DIFF/WS				\$77,557		\$9,830	\$48,629
51	51	Lakeland Regional Medical Center		add natural gas; improve FF performance; add packed-bed scrubber (in place of increasing lime); increase activated carbon; add SNCR	DIFF/WS	\$69,125			\$56,424		\$7,151	\$35,378
54	54	Bayfront Medical Center		add natural gas; improve FF performance; add caustic; increase activated carbon; add SNCR	DIFF/WS				\$49,199		\$6,235	\$30,848

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	Consolidated beyond-the-floor controls	APCD code with MACT floor and BTF controls	Packed-bed scrubber	DIFF	Secondary chamber retrofit	SNCR	ACI	Improve FF performance	Increase carbon
55	55	St. Joseph's Hospital		secondary chamber retrofit (in place of increasing natural gas); improve FF performance; add caustic; increase activated carbon; add SNCR	DIFF/WS			\$42,350	\$56,831		\$7,203	\$35,634
59	59--1	Stericycle, Inc.	Unit 1	add more natural gas; improve FF performance; add more caustic; increase activated carbon; add SNCR	DIFF/WS				\$67,944		\$8,611	\$42,601
59	59--2	Stericycle, Inc.	Unit 2	add more natural gas; improve FF performance; add more caustic; increase activated carbon; add SNCR	DIFF/WS				\$66,510		\$8,429	\$41,703
60	60--1	BMWNC, Inc.	Unit 1	add natural gas; replace DIFF; add caustic; further increase activated carbon; add SNCR	DIFF/WS		\$586,769		\$114,830			\$71,999
65	65--1	Stericycle, Inc.	Unit 1	add natural gas; improve FF performance; add more caustic; increase activated carbon; add SNCR	DIFF/WS				\$56,108		\$7,111	\$35,180
65	65--2	Stericycle, Inc.	Unit 2	secondary chamber retrofit (in place of increasing natural gas); improve FF performance; add more caustic; increase activated carbon; add SNCR	DIFF/WS			\$39,537	\$53,056		\$6,724	\$33,266
71	71	Loyola University Medical Center		add natural gas; improve FF performance; add packed-bed scrubber; increase activated carbon; add SNCR	DIFF/WS	\$91,775			\$59,876		\$7,589	\$37,543
77	77	Parkview Hospital		secondary chamber retrofit (in place of increasing natural gas); improve FF performance; add packed-bed scrubber (in place of adding caustic); increase activated carbon; add SNCR	DIFF/WS	\$71,952		\$35,000	\$46,968		\$5,953	\$29,449
84	84	Mayo Clinic, Waste Management Facility		improve FF performance; add caustic; further increase activated carbon; increase NO _x reagent	DIFF/WS						\$14,021	\$69,367
87	87	MedCentral Health System, Mansfield Hospital		add more natural gas; improve FF performance; add caustic; further increase activated carbon; add SNCR	DIFF/WS				\$39,917		\$5,059	\$25,028
94	94	Stericycle, Inc.		add more natural gas; improve FF performance; add more caustic; increase activated carbon; add SNCR	DIFF/WS				\$46,467		\$5,889	\$29,135
98	98--1	University of Texas Medical Branch		improve FF performance; add caustic; further increase activated carbon; add SNCR	DIFF/WS				\$76,990		\$9,758	\$48,274
106	106	Stericycle, Inc.		add more natural gas; improve FF performance; add more caustic; increase activated carbon; add SNCR	DIFF/WS				\$60,958		\$7,726	\$38,221
109	109	Healthcare Environmental Services Inc.		add natural gas; improve FF performance; add caustic; further increase activated carbon; increase NO _x reagent	DIFF/WS						\$9,636	\$47,674
110	110	Stericycle, Inc.		add natural gas; improve FF performance; add more sodium bicarbonate; further increase activated carbon; increase NO _x reagent	DIFF-ESP/WS						\$13,538	\$66,976
120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	add more natural gas; improve FF performance; add caustic; further increase activated carbon; add SNCR	DIFF/WS				\$170,318		\$21,586	\$106,791
120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	improve FF performance; add caustic; increase activated carbon; add SNCR	DIFF/WS				\$153,292		\$19,428	\$96,115
125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		add natural gas and caustic; increase activated carbon; add SNCR	CA/WS				\$53,042			\$33,258

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	Consolidated beyond-the-floor controls	APCD code with MACT floor and BTF controls	Packed-bed scrubber	DIFF	Secondary chamber retrofit	SNCR	ACI	Improve FF performance	Increase carbon
130	130	Department of Veterans Affairs Medical Center		improve FF performance; add more caustic; add ACI and SNCR	DIFF/WS				\$109,042	\$90,410	\$13,820	
13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		improve FF performance; increase activated carbon; add SNCR	DIFF/WS				\$45,491		\$9,429	\$6,997
16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		add natural gas; improve FF performance; add more caustic; increase activated carbon; add SNCR	DIFF/WS				\$43,596		\$9,036	\$6,706
18	18	Franklin Square Hospital Center		add natural gas; improve FF performance; add caustic; increase activated carbon; add SNCR	DIFF/WS				\$69,202		\$14,344	\$10,644
21	21	Washington County Hospital		add natural gas; improve FF performance; add caustic; increase activated carbon; add SNCR	DIFF/WS				\$42,304		\$8,768	\$6,507
25	25	Holy Spirit Hospital		improve FF performance; add more caustic; increase activated carbon; add SNCR	DIFF/WS				\$39,277		\$8,141	\$6,041
30	30	Riddle Memorial Hospital		improve FF performance; add caustic; further increase activated carbon; add SNCR	DIFF/WS				\$39,903		\$8,271	\$6,138
34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		increase natural gas; improve FF performance; add packed-bed scrubber; add SNCR	FF/WS	\$77,257			\$48,844		\$10,124	
38	38	Wilkes-Barre General Hospital		increase natural gas; add caustic; further increase activated carbon; add SNCR	DIFF/WS				\$47,599			\$7,321
41	41	Thomas Memorial Hospital		improve FF performance; add more caustic; increase activated carbon; add SNCR	DIFF/WS				\$35,213		\$7,299	\$5,416
47	47	Malcolm Randall Veterans Affairs Medical Center		add natural gas; improve FF performance; add caustic; increase activated carbon; add SNCR	DIFF/WS				\$37,953		\$7,866	\$5,838
63	63	St. Jude Children's Research Hospital		add caustic; further increase activated carbon; add SNCR	DIFF/WS				\$53,827			\$8,279
81	81	South Bend Medical Foundation		increase natural gas; improve FF performance; add caustic; increase activated carbon; add SNCR	DIFF/WS				\$53,631		\$11,116	\$8,249
82	82	Good Samaritan Hospital		minor adjustment of system to obtain additional CO control (marginal difference in CO); improve FF performance; add more caustic; increase activated carbon; add SNCR	DIFF/WS				\$31,193		\$6,465	\$4,798
88	88	Medina General Hospital		add natural gas; improve FF performance; add more caustic; increase activated carbon; add SNCR	DIFF/WS				\$26,611		\$5,516	\$4,093
95	95	St. Joseph's Hospital		increase natural gas; add caustic; further increase activated carbon; add SNCR	DIFF/WS				\$37,699			\$5,799
108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	increase natural gas; add DIFF (in place of FF); improve FF performance; add caustic, ACI, and SNCR	DIFF/WS		\$45,314		\$41,302	\$12,453	\$8,561	
111	111	Wyoming Medical Center		add more natural gas; improve FF performance; add caustic; increase activated carbon; add SNCR	DIFF/WS				\$34,718		\$7,196	\$5,340
86	86	Fairfield Medical Center		increase natural gas; add DIFF; add more caustic; increase activated carbon; add SNCR	DIFF/WS		\$245,497		\$27,883			\$7,774
129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	increase natural gas; add DIFF; add more caustic; add ACI and SNCR	DIFF/WS		\$160,209		\$18,196	\$11,226		
115	115	Kona Community Hospital		add DIFF, packed-bed scrubber, ACI, and SNCR	DIFF/WS	\$58,829	\$191,819		\$26,603	\$6,166		
116	116	Yukon-Kuskokwim Delta Regional Hospital		improve FF performance; add packed-bed scrubber; increase activated carbon; add SNCR	DIFF/WS	\$48,068			\$21,737		\$1,202	\$1,487

Table 19. Nationwide Beyond-the-Floor Costs for Existing

FACID	UNITID	Facility name	Unit number	Consolidated beyond-the-floor controls	APCD code with MACT floor and BTF controls	Packed-bed scrubber	DIFF	Secondary chamber retrofit	SNCR	ACI	Improve FF performance	Increase carbon
Total large						\$424,030	\$8,059,870	\$159,633	\$2,300,054	\$90,410	\$245,612	\$2,178,230
Total medium						\$77,257	\$45,314	\$0	\$728,362	\$12,453	\$122,132	\$98,166
Total small						\$0	\$405,706	\$0	\$46,079	\$11,226	\$0	\$7,774
Total small rural						\$106,897	\$191,819	\$0	\$48,340	\$6,166	\$1,202	\$1,487
Total nationwide						\$608,184	\$8,702,709	\$159,633	\$3,122,836	\$120,256	\$368,945	\$2,285,657

Note:

Assume incinerators operating at 2/3 of capacity.

Key:

Emissions data unavailable; used average emissions data from similar unit

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	Increase natural gas	Increase caustic	Increase NaHCO ₃	Increase NO _x reagent	Total BTF control cost	MACT floor and BTF control cost	Additional monitoring	DIFF monitoring	WS monitoring	SNCR monitoring	ACI monitoring	Total BTF monitoring cost
1	1	Bristol-Myers Squibb Co.			\$23			\$49,110	\$203,922	SNCR			\$3,100		\$3,100
5	5	Merck & Company, Inc.						\$1,015,664	\$1,134,889	PB, SNCR		\$5,200	\$3,100		\$8,300
15	15--1	Curtis Bay Energy	Unit 1		\$383		\$12,714	\$2,651,566	\$4,292,265	none					\$0
15	15--2	Curtis Bay Energy	Unit 2		\$422		\$14,035	\$2,993,085	\$4,738,584	none					\$0
20	20--1	Fort Detrick	Unit 5		\$33			\$72,214	\$316,687	SNCR			\$3,100		\$3,100
20	20--2	Fort Detrick	Unit 6		\$32			\$68,765	\$301,560	SNCR			\$3,100		\$3,100
29	29	Hamot Medical Center			\$51			\$423,387	\$559,102	SNCR			\$3,100		\$3,100
36	36--1	Merck & Company, Inc.	Unit 2		\$72			\$598,911	\$808,856	SNCR			\$3,100		\$3,100
36	36--2	Merck & Company, Inc.	Unit 5		\$112			\$928,889	\$1,254,507	SNCR			\$3,100		\$3,100
40	40	Charleston Area Medical Center, General Hospital		\$32,649	\$60			\$527,242	\$672,404	SNCR			\$3,100		\$3,100
42	42	Stericycle, Inc.		\$52,920	\$97			\$261,687	\$979,859	SNCR			\$3,100		\$3,100
43	43	Boca Raton Community Hospital		\$15,689	\$29			\$77,581	\$329,085	SNCR			\$3,100		\$3,100
44	44	Bethesda Memorial Hospital			\$63			\$135,162	\$592,738	SNCR			\$3,100		\$3,100
46	46	Holy Cross Hospital			\$47			\$143,390	\$509,574	SNCR			\$3,100		\$3,100
48	48	Memorial Regional Hospital			\$63			\$136,079	\$596,759	SNCR			\$3,100		\$3,100
51	51	Lakeland Regional Medical Center		\$25,095				\$193,172	\$476,014	PB, SNCR		\$5,200	\$3,100		\$8,300
54	54	Bayfront Medical Center		\$21,882	\$40			\$108,205	\$458,944	SNCR			\$3,100		\$3,100

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	Increase natural gas	Increase caustic	Increase NaHCO ₃	Increase NO _x reagent	Total BTF control cost	MACT floor and BTF control cost	Additional monitoring	DIFF monitoring	WS monitoring	SNCR monitoring	ACI monitoring	Total BTF monitoring cost
55	55	St. Joseph's Hospital			\$46			\$142,064	\$454,224	SNCR			\$3,100		\$3,100
59	59--1	Stericycle, Inc.	Unit 1	\$30,219	\$55			\$149,431	\$583,227	SNCR			\$3,100		\$3,100
59	59--2	Stericycle, Inc.	Unit 2	\$29,581	\$54			\$146,278	\$570,922	SNCR			\$3,100		\$3,100
60	60--1	BMWNC, Inc.	Unit 1	\$51,072	\$93			\$824,764	\$1,209,411	SNCR			\$3,100		\$3,100
65	65--1	Stericycle, Inc.	Unit 1	\$24,955	\$46			\$123,400	\$523,442	SNCR			\$3,100		\$3,100
65	65--2	Stericycle, Inc.	Unit 2		\$43			\$132,626	\$471,367	SNCR			\$3,100		\$3,100
71	71	Loyola University Medical Center		\$26,631				\$223,412	\$650,267	SNCR			\$3,100		\$3,100
77	77	Parkview Hospital						\$189,323	\$489,197	SNCR			\$3,100		\$3,100
84	84	Mayo Clinic, Waste Management Facility			\$90		\$2,991	\$86,469	\$733,209	none					\$0
87	87	MedCentral Health System, Mansfield Hospital		\$17,754	\$32			\$87,790	\$298,975	SNCR			\$3,100		\$3,100
94	94	Stericycle, Inc.		\$20,667	\$38			\$102,197	\$398,872	SNCR			\$3,100		\$3,100
98	98--1	University of Texas Medical Branch			\$63			\$135,084	\$592,333	SNCR			\$3,100		\$3,100
106	106	Stericycle, Inc.		\$27,112	\$50			\$134,066	\$523,259	SNCR			\$3,100		\$3,100
109	109	Healthcare Environmental Services Inc.		\$33,817	\$62		\$2,055	\$93,245	\$628,210	none					\$0
110	110	Stericycle, Inc.		\$47,509		\$128,318	\$2,888	\$259,230	\$1,109,630	none					\$0
120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	\$75,751	\$139			\$374,584	\$1,275,670	SNCR			\$3,100		\$3,100
120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2		\$125			\$268,960	\$915,675	SNCR			\$3,100		\$3,100
125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		\$23,591	\$43			\$109,934	\$173,051	SNCR			\$3,100		\$3,100

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	Increase natural gas	Increase caustic	Increase NaHCO ₃	Increase NO _x reagent	Total BTF control cost	MACT floor and BTF control cost	Additional monitoring	DIFF monitoring	WS monitoring	SNCR monitoring	ACI monitoring	Total BTF monitoring cost
130	130	Department of Veterans Affairs Medical Center			\$89			\$213,360	\$770,642	ACI, SNCR			\$3,100	\$4,800	\$7,900
13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility						\$61,918	\$301,404	SNCR			\$3,100		\$3,100
16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		\$4,757	\$8			\$64,102	\$322,071	SNCR			\$3,100		\$3,100
18	18	Franklin Square Hospital Center		\$7,550	\$12			\$101,752	\$620,657	SNCR			\$3,100		\$3,100
21	21	Washington County Hospital		\$4,616	\$8			\$62,202	\$379,415	SNCR			\$3,100		\$3,100
25	25	Holy Spirit Hospital			\$7			\$53,467	\$260,245	SNCR			\$3,100		\$3,100
30	30	Riddle Memorial Hospital			\$7			\$54,318	\$264,381	SNCR			\$3,100		\$3,100
34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		\$5,329				\$141,554	\$330,373	SNCR			\$3,100		\$3,100
38	38	Wilkes-Barre General Hospital		\$5,193	\$9			\$60,122	\$142,732	SNCR			\$3,100		\$3,100
41	41	Thomas Memorial Hospital			\$6			\$47,934	\$233,316	SNCR			\$3,100		\$3,100
47	47	Malcolm Randall Veterans Affairs Medical Center		\$4,141	\$7			\$55,804	\$340,389	SNCR			\$3,100		\$3,100
63	63	St. Jude Children's Research Hospital			\$10			\$62,116	\$155,534	SNCR			\$3,100		\$3,100
81	81	South Bend Medical Foundation		\$5,852	\$10			\$78,858	\$446,026	SNCR			\$3,100		\$3,100
82	82	Good Samaritan Hospital			\$6			\$42,462	\$206,680	SNCR			\$3,100		\$3,100
88	88	Medina General Hospital		\$2,903	\$5			\$39,128	\$196,584	SNCR			\$3,100		\$3,100
95	95	St. Joseph's Hospital		\$4,113	\$7			\$47,618	\$113,046	SNCR			\$3,100		\$3,100
108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	\$4,506	\$7			\$112,144	\$271,810	DIFF, ACI, SNCR	\$1,600		\$3,100	\$1,600	\$6,300
111	111	Wyoming Medical Center		\$3,788	\$6			\$51,048	\$237,604	SNCR			\$3,100		\$3,100
86	86	Fairfield Medical Center		\$5,515	\$6			\$286,675	\$303,884	DIFF, SNCR	\$7,400		\$3,100		\$10,500
129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	\$3,599	\$4			\$193,234	\$209,122	DIFF, ACI, SNCR	\$7,400		\$3,100	\$3,200	\$13,700
115	115	Kona Community Hospital						\$283,417	\$283,417	DIFF, PB, ACI, SNCR	\$5,500	\$5,200	\$3,100	\$1,300	\$15,100
116	116	Yukon-Kuskokwim Delta Regional Hospital						\$72,494	\$234,263	PB, SNCR		\$5,200	\$3,100		\$8,300

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	Increase natural gas	Increase caustic	Increase NaHCO ₃	Increase NO _x reagent	Total BTF control cost	MACT floor and BTF control cost	Additional monitoring	DIFF monitoring	WS monitoring	SNCR monitoring	ACI monitoring	Total BTF monitoring cost
Total large				\$556,895	\$2,594	\$128,318	\$34,683	\$14,180,328	\$30,597,330		\$0	\$10,400	\$96,100	\$4,800	\$111,300
Total medium				\$52,749	\$114	\$0	\$0	\$1,136,546	\$4,822,267		\$1,600	\$0	\$52,700	\$1,600	\$55,900
Total small				\$9,114	\$10	\$0	\$0	\$479,910	\$513,006		\$14,800	\$0	\$6,200	\$3,200	\$24,200
Total small rural				\$0	\$0	\$0	\$0	\$355,911	\$517,681		\$5,500	\$10,400	\$6,200	\$1,300	\$23,400
Total nationwide				\$618,757	\$2,718	\$128,318	\$34,683	\$16,152,695	\$36,450,284		\$21,900	\$20,800	\$161,200	\$10,900	\$214,800

Note:

Assume incinerators operating at 2/3 of capacity.

Key:

Emissions data unavailable; used average emissions data from similar unit

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	MACT floor and BTF monitoring cost	Additional stack testing	HCl testing	CO testing	Metals testing	PM testing	CDD/CDF testing	NO _x testing	SO ₂ testing	Opacity testing	Total BTF testing cost	MACT floor and BTF testing cost
1	1	Bristol-Myers Squibb Co.		\$18,800	none									\$0	\$3,462
5	5	Merck & Company, Inc.		\$14,000	SO ₂ (already test for HCl)							\$7,000		\$512	\$3,462
15	15--1	Curtis Bay Energy	Unit 1	\$14,000	none									\$0	\$3,975
15	15--2	Curtis Bay Energy	Unit 2	\$14,000	none (already test for CO)									\$0	\$3,975
20	20--1	Fort Detrick	Unit 5	\$17,800	none									\$0	\$3,975
20	20--2	Fort Detrick	Unit 6	\$17,800	none									\$0	\$3,975
29	29	Hamot Medical Center		\$9,200	metals, NO _x , SO ₂			\$14,000			\$7,000	\$7,000		\$2,049	\$4,926
36	36--1	Merck & Company, Inc.	Unit 2	\$14,000	metals			\$14,000						\$1,537	\$4,414
36	36--2	Merck & Company, Inc.	Unit 5	\$14,000	SO ₂							\$7,000		\$769	\$3,718
40	40	Charleston Area Medical Center, General Hospital		\$9,200	metals, CDD/CDF, SO ₂			\$14,000		\$26,000		\$7,000		\$3,440	\$3,462
42	42	Stericycle, Inc.		\$9,200	none									\$0	\$3,462
43	43	Boca Raton Community Hospital		\$17,800	none (already test for HCl)									\$0	\$3,975
44	44	Bethesda Memorial Hospital		\$17,800	none									\$0	\$3,462
46	46	Holy Cross Hospital		\$17,800	none (already test for HCl)									\$0	\$2,950
48	48	Memorial Regional Hospital		\$17,800	none (already test for HCl)									\$0	\$3,975
51	51	Lakeland Regional Medical Center		\$14,000	SO ₂							\$7,000		\$769	\$3,718
54	54	Bayfront Medical Center		\$17,800	none (already test for HCl, PM)									\$0	\$3,462

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	MACT floor and BTF monitoring cost	Additional stack testing	HCl testing	CO testing	Metals testing	PM testing	CDD/CDF testing	NO _x testing	SO ₂ testing	Opacity testing	Total BTF testing cost	MACT floor and BTF testing cost
55	55	St. Joseph's Hospital		\$8,800	none									\$0	\$3,462
59	59--1	Stericycle, Inc.	Unit 1	\$17,800	none									\$0	\$3,975
59	59--2	Stericycle, Inc.	Unit 2	\$17,800	none									\$0	\$3,975
60	60--1	BMWNC, Inc.	Unit 1	\$9,200	none (already test for PM)									\$0	\$3,462
65	65--1	Stericycle, Inc.	Unit 1	\$17,800	none (already test for HCl)									\$0	\$2,071
65	65--2	Stericycle, Inc.	Unit 2	\$17,800	none (already test for HCl)									\$0	\$2,071
71	71	Loyola University Medical Center		\$17,800	none (already test for HCl)									\$0	\$2,950
77	77	Parkview Hospital		\$17,800	none									\$0	\$3,975
84	84	Mayo Clinic, Waste Management Facility		\$9,200	none									\$0	\$1,559
87	87	MedCentral Health System, Mansfield Hospital		\$9,200	none									\$0	\$3,975
94	94	Stericycle, Inc.		\$17,800	none									\$0	\$3,975
98	98--1	University of Texas Medical Branch		\$17,800	none (already test for HCl)									\$0	\$2,950
106	106	Stericycle, Inc.		\$17,800	CDD/CDF					\$26,000				\$2,855	\$4,926
109	109	Healthcare Environmental Services Inc.		\$9,200	none									\$0	\$3,975
110	110	Stericycle, Inc.		\$8,200	none									\$0	\$3,975
120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	\$9,200	none									\$0	\$1,559
120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	\$9,200	metals			\$14,000						\$1,537	\$1,559
125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		\$4,000	metals (already test for HCl)			\$14,000						\$1,537	\$1,559

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	MACT floor and BTF monitoring cost	Additional stack testing	HCl testing	CO testing	Metals testing	PM testing	CDD/CDF testing	NO _x testing	SO ₂ testing	Opacity testing	Total BTF testing cost	MACT floor and BTF testing cost
130	130	Department of Veterans Affairs Medical Center		\$17,800	CDD/CDF					\$26,000				\$2,855	\$4,414
13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		\$11,400	NO _x						\$7,000			\$769	\$3,718
16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		\$11,400	NO _x						\$7,000			\$769	\$4,231
18	18	Franklin Square Hospital Center		\$11,400	NO _x						\$7,000			\$769	\$4,231
21	21	Washington County Hospital		\$16,600	none									\$0	\$3,975
25	25	Holy Spirit Hospital		\$11,400	none									\$0	\$3,975
30	30	Riddle Memorial Hospital		\$11,400	NO _x (already test for HCl)						\$7,000			\$769	\$3,718
34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		\$8,200	SO ₂ (already test for CO)							\$7,000		\$769	\$2,328
38	38	Wilkes-Barre General Hospital		\$9,200	SO ₂ (already test for CO)							\$7,000		\$769	\$4,231
41	41	Thomas Memorial Hospital		\$11,400	NO _x , SO ₂						\$7,000	\$7,000		\$1,025	\$2,584
47	47	Malcolm Randall Veterans Affairs Medical Center		\$16,600	NO _x , SO ₂						\$7,000	\$7,000		\$1,025	\$3,975
63	63	St. Jude Children's Research Hospital		\$9,200	metals, NO _x , SO ₂			\$14,000			\$7,000	\$7,000		\$2,049	\$4,926
81	81	South Bend Medical Foundation		\$16,600	none (already test for CO, PM)									\$0	\$3,462
82	82	Good Samaritan Hospital		\$11,400	none (already test for CO)									\$0	\$3,975
88	88	Medina General Hospital		\$11,400	none									\$0	\$3,975
95	95	St. Joseph's Hospital		\$9,200	metals (already test for CO)			\$14,000						\$1,537	\$4,487
108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	\$11,400	NO _x , SO ₂ (already test for CO)						\$7,000	\$7,000		\$1,025	\$2,584
111	111	Wyoming Medical Center		\$11,400	NO _x , SO ₂						\$7,000	\$7,000		\$1,025	\$3,975
86	86	Fairfield Medical Center		\$14,600	none									\$0	\$2,071
129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	\$14,600	none									\$0	\$1,047
115	115	Kona Community Hospital		\$15,100	CDD/CDF (already test for HCl)					\$26,000				\$2,855	\$22,259
116	116	Yukon-Kuskokwim Delta Regional Hospital		\$15,100	CDD/CDF, NO _x , SO ₂ (already test for HCl)					\$26,000	\$7,000	\$7,000		\$2,928	\$21,820

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	MACT floor and BTF monitoring cost	Additional stack testing	HCl testing	CO testing	Metals testing	PM testing	CDD/CDF testing	NO _x testing	SO ₂ testing	Opacity testing	Total BTF testing cost	MACT floor and BTF testing cost
Total large				\$509,200		\$0	\$0	\$70,000	\$0	\$78,000	\$7,000	\$35,000	\$0	\$17,860	\$124,712
Total medium				\$199,600		\$0	\$0	\$28,000	\$0	\$0	\$63,000	\$49,000	\$0	\$12,297	\$64,347
Total small				\$29,200		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,118
Total small rural				\$30,200		\$0	\$0	\$0	\$0	\$52,000	\$7,000	\$7,000	\$0	\$5,783	\$44,080
Total nationwide				\$768,200		\$0	\$0	\$98,000	\$0	\$130,000	\$77,000	\$91,000	\$0	\$35,939	\$236,257

Note:

Assume incinerators operating at 2/3 of capacity.

Key:

Emissions data unavailable; used average emissions data from similar unit

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	Performance spec test	Notification of performance test	Notification of CMS demonstration	Initial test report	Total BTF record-keeping and reporting cost	MACT floor and BTF record-keeping and reporting cost	Total BTF cost	Total MACT floor and BTF cost
1	1	Bristol-Myers Squibb Co.		\$0	\$0	\$0	\$0	\$0	\$1,264	\$52,210	\$227,449
5	5	Merck & Company, Inc.		\$0	\$0	\$0	\$0	\$0	\$1,264	\$1,024,476	\$1,153,616
15	15--1	Curtis Bay Energy	Unit 1	\$0	\$0	\$0	\$0	\$0	\$1,264	\$2,651,566	\$4,311,504
15	15--2	Curtis Bay Energy	Unit 2	\$0	\$0	\$0	\$0	\$0	\$1,264	\$2,993,085	\$4,757,823
20	20--1	Fort Detrick	Unit 5	\$0	\$0	\$0	\$0	\$0	\$1,264	\$75,314	\$339,726
20	20--2	Fort Detrick	Unit 6	\$0	\$0	\$0	\$0	\$0	\$1,264	\$71,865	\$324,599
29	29	Hamot Medical Center		\$0	\$0	\$0	\$0	\$0	\$1,264	\$428,536	\$574,493
36	36--1	Merck & Company, Inc.	Unit 2	\$0	\$0	\$0	\$0	\$0	\$1,264	\$603,548	\$828,534
36	36--2	Merck & Company, Inc.	Unit 5	\$0	\$0	\$0	\$0	\$0	\$1,264	\$932,758	\$1,273,489
40	40	Charleston Area Medical Center, General Hospital		\$0	\$44	\$0	\$262	\$305	\$1,264	\$534,087	\$686,331
42	42	Stericycle, Inc.		\$0	\$0	\$0	\$0	\$0	\$1,264	\$264,787	\$993,785
43	43	Boca Raton Community Hospital		\$0	\$0	\$0	\$0	\$0	\$1,264	\$80,681	\$352,124
44	44	Bethesda Memorial Hospital		\$0	\$0	\$0	\$0	\$0	\$1,264	\$138,262	\$615,264
46	46	Holy Cross Hospital		\$0	\$0	\$0	\$0	\$0	\$1,264	\$146,490	\$531,588
48	48	Memorial Regional Hospital		\$0	\$0	\$0	\$0	\$0	\$1,264	\$139,179	\$619,798
51	51	Lakeland Regional Medical Center		\$0	\$0	\$0	\$0	\$0	\$1,264	\$202,241	\$494,997
54	54	Bayfront Medical Center		\$0	\$0	\$0	\$0	\$0	\$1,264	\$111,305	\$481,471

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	Performance spec test	Notification of performance test	Notification of CMS demonstration	Initial test report	Total BTF record-keeping and reporting cost	MACT floor and BTF record-keeping and reporting cost	Total BTF cost	Total MACT floor and BTF cost
55	55	St. Joseph's Hospital		\$0	\$0	\$0	\$0	\$0	\$1,264	\$145,164	\$467,750
59	59--1	Stericycle, Inc.	Unit 1	\$0	\$0	\$0	\$0	\$0	\$1,264	\$152,531	\$606,266
59	59--2	Stericycle, Inc.	Unit 2	\$0	\$0	\$0	\$0	\$0	\$1,264	\$149,378	\$593,961
60	60--1	BMWNC, Inc.	Unit 1	\$0	\$0	\$0	\$0	\$0	\$1,264	\$827,864	\$1,223,337
65	65--1	Stericycle, Inc.	Unit 1	\$0	\$0	\$0	\$0	\$0	\$1,264	\$126,500	\$544,578
65	65--2	Stericycle, Inc.	Unit 2	\$0	\$0	\$0	\$0	\$0	\$1,264	\$135,726	\$492,503
71	71	Loyola University Medical Center		\$0	\$0	\$0	\$0	\$0	\$1,264	\$226,512	\$672,282
77	77	Parkview Hospital		\$0	\$0	\$0	\$0	\$0	\$1,264	\$192,423	\$512,236
84	84	Mayo Clinic, Waste Management Facility		\$0	\$0	\$0	\$0	\$0	\$1,264	\$86,469	\$745,232
87	87	MedCentral Health System, Mansfield Hospital		\$0	\$0	\$0	\$0	\$0	\$1,264	\$90,890	\$313,414
94	94	Stericycle, Inc.		\$0	\$0	\$0	\$0	\$0	\$1,264	\$105,297	\$421,911
98	98--1	University of Texas Medical Branch		\$0	\$0	\$0	\$0	\$0	\$1,264	\$138,184	\$614,347
106	106	Stericycle, Inc.		\$0	\$0	\$0	\$0	\$0	\$1,264	\$140,021	\$547,250
109	109	Healthcare Environmental Services Inc.		\$0	\$0	\$0	\$0	\$0	\$1,264	\$93,245	\$642,649
110	110	Stericycle, Inc.		\$0	\$0	\$0	\$0	\$0	\$1,264	\$259,230	\$1,123,069
120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	\$0	\$0	\$0	\$0	\$0	\$1,264	\$377,684	\$1,287,694
120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	\$0	\$44	\$0	\$262	\$305	\$1,264	\$273,902	\$927,698
125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		\$0	\$44	\$0	\$262	\$305	\$1,264	\$114,876	\$179,874

Table 19. Nationwide Beyond-the-Floor Costs for Exis

FACID	UNITID	Facility name	Unit number	Performance spec test	Notification of performance test	Notification of CMS demonstration	Initial test report	Total BTF record-keeping and reporting cost	MACT floor and BTF record-keeping and reporting cost	Total BTF cost	Total MACT floor and BTF cost
130	130	Department of Veterans Affairs Medical Center		\$0	\$0	\$0	\$0	\$0	\$1,264	\$224,115	\$794,121
13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		\$0	\$0	\$0	\$0	\$0	\$1,264	\$65,786	\$317,786
16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		\$0	\$0	\$0	\$0	\$0	\$1,264	\$67,970	\$338,966
18	18	Franklin Square Hospital Center		\$0	\$0	\$0	\$0	\$0	\$1,264	\$105,621	\$637,552
21	21	Washington County Hospital		\$0	\$0	\$0	\$0	\$0	\$1,264	\$65,302	\$401,254
25	25	Holy Spirit Hospital		\$0	\$0	\$0	\$0	\$0	\$1,264	\$56,567	\$276,884
30	30	Riddle Memorial Hospital		\$0	\$0	\$0	\$0	\$0	\$1,264	\$58,186	\$280,764
34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		\$0	\$0	\$0	\$0	\$0	\$1,264	\$145,422	\$342,165
38	38	Wilkes-Barre General Hospital		\$0	\$0	\$0	\$0	\$0	\$1,264	\$63,991	\$157,427
41	41	Thomas Memorial Hospital		\$0	\$0	\$0	\$0	\$0	\$1,264	\$52,059	\$248,565
47	47	Malcolm Randall Veterans Affairs Medical Center		\$0	\$0	\$0	\$0	\$0	\$1,264	\$59,929	\$362,228
63	63	St. Jude Children's Research Hospital		\$0	\$0	\$0	\$0	\$0	\$1,264	\$67,265	\$170,925
81	81	South Bend Medical Foundation		\$0	\$0	\$0	\$0	\$0	\$1,264	\$81,958	\$467,353
82	82	Good Samaritan Hospital		\$0	\$0	\$0	\$0	\$0	\$1,264	\$45,562	\$223,319
88	88	Medina General Hospital		\$0	\$0	\$0	\$0	\$0	\$1,264	\$42,228	\$213,223
95	95	St. Joseph's Hospital		\$0	\$0	\$0	\$0	\$0	\$1,264	\$52,255	\$127,997
108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	\$0	\$0	\$0	\$0	\$0	\$1,264	\$119,469	\$287,058
111	111	Wyoming Medical Center		\$0	\$0	\$0	\$0	\$0	\$1,264	\$55,173	\$254,243
86	86	Fairfield Medical Center		\$0	\$0	\$0	\$0	\$0	\$1,264	\$297,175	\$321,820
129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	\$0	\$0	\$0	\$0	\$0	\$1,264	\$206,934	\$226,034
115	115	Kona Community Hospital		\$698	\$0	\$87	\$0	\$785	\$3,793	\$302,157	\$324,570
116	116	Yukon-Kuskokwim Delta Regional Hospital		\$0	\$0	\$0	\$0	\$0	\$3,009	\$83,721	\$274,192

Table 19. Nationwide Beyond-the-Floor Costs for Existing

FACID	UNITID	Facility name	Unit number	Performance spec test	Notification of performance test	Notification of CMS demonstration	Initial test report	Total BTF record-keeping and reporting cost	MACT floor and BTF record-keeping and reporting cost	Total BTF cost	Total MACT floor and BTF cost
Total large				\$0	\$131	\$0	\$785	\$916	\$45,520	\$14,310,403	\$31,276,762
Total medium				\$0	\$0	\$0	\$0	\$0	\$21,496	\$1,204,743	\$5,107,709
Total small				\$0	\$0	\$0	\$0	\$0	\$2,529	\$504,110	\$547,853
Total small rural				\$698	\$0	\$87	\$0	\$785	\$6,802	\$385,878	\$598,762
Total nationwide				\$698	\$131	\$87	\$785	\$1,700	\$76,346	\$16,405,135	\$37,531,087

Note:
Assume incinerators operating at 2/3 of capacity.

Key:
Emissions data unavailable; used average emissions data from similar unit

Table 20. Nationwide Cost Effectiveness for Existing Sources

No.	FACID	UNITID	Facility name	Unit number	City	State	Category	New/ existing	APCD description	APCD code
1	1	1	Bristol-Myers Squibb Co.		Wallingford	CT	L	E	Secondary chamber (1800F) and baghouse	FF
2	5	5	Merck & Company, Inc.		Rahway	NJ	L	E	Secondary chamber (1500F, 1 sec), partial quench, dry acid gas scrubber with dry lime injection, and baghouse	DIFF
3	15	15--1	Curtis Bay Energy	Unit 1	Baltimore	MD	L	E	Secondary chamber, dry scrubber, and baghouse	DIFF
4	15	15--2	Curtis Bay Energy	Unit 2	Baltimore	MD	L	E	Secondary chamber, dry scrubber, and baghouse	DIFF
5	20	20--1	Fort Detrick	Unit 5	Fort Detrick	MD	L	E	Secondary chamber and rotary atomizing wet scrubber	WS
6	20	20--2	Fort Detrick	Unit 6	Fort Detrick	MD	L	E	Secondary chamber and rotary atomizing wet scrubber	WS
7	29	29	Hamot Medical Center		Erie	PA	L	E	Secondary chamber (2000F, 2 sec), lime injection system, powdered activated carbon injection system, baghouse, and vertical upflow two-stage multi-microventuri scrubber system	DIFF/WS
8	36	36--1	Merck & Company, Inc.	Unit 2	West Point (Upper Gwynedd Township)	PA	L	E	Secondary/tertiary chamber (2000F, 2 sec), water quench followed by sodium bicarbonate injection system with dry reaction chamber and pulse-jet baghouse	DIFF
9	36	36--2	Merck & Company, Inc.	Unit 5	West Point (Upper Gwynedd Township)	PA	L	E	Secondary chamber (1800F, 2.2 sec), water quench followed by sodium bicarbonate injection system and pulse-jet baghouse	DIFF
10	40	40	Charleston Area Medical Center, General Hospital		Charleston	WV	L	E	Secondary chamber (1800F, 2 sec), dry injection/baghouse scrubber system with activated carbon	DIFF
11	42	42	Stericycle, Inc.		Apopka	FL	L	E	Secondary chamber (1800, 1 sec), dry scrubbing system with quench chamber, passive absorber, lime and carbon injection, and baghouse.	DIFF
12	43	43	Boca Raton Community Hospital		Boca Raton	FL	L	E	Secondary chamber (1800F, 1 sec) and rotary atomizing wet scrubber system with caustic soda injection	WS
13	44	44	Bethesda Memorial Hospital		Boynton Beach	FL	L	E	Secondary chamber (1800F, 2 sec) and rotary atomizing scrubber with mist eliminator	WS
14	46	46	Holy Cross Hospital		Fort Lauderdale	FL	L	E	Secondary chamber (1800F, 1 sec) and venturi scrubber with packed bed absorption unit using dilute NaOH	WS
15	48	48	Memorial Regional Hospital		Hollywood	FL	L	E	Secondary chamber (1800F, 1 sec), packed column gas scrubber, and wet ESP	WS

Table 20. Nationwide Cost Effectiveness for Existing Sources

No.	FACID	UNITID	Facility name	Unit number	City	State	Category	New/ existing	APCD description	APCD code
16	51	51	Lakeland Regional Medical Center		Lakeland	FL	L	E	Secondary chamber (1800F, 1 sec), lime injection system, and baghouse	DIFF
17	54	54	Bayfront Medical Center		St. Petersburg	FL	L	E	Secondary chamber (1800F, 1 sec) and flux force/condensation collision scrubber system using dilute NaOH	WS
18	55	55	St. Joseph's Hospital		Tampa	FL	L	E	Secondary chamber (1800F, 1 sec), lime injection, baghouse, and venturi scrubber	DIFF/WS
19	59	59--1	Stericycle, Inc.	Unit 1	Haw River	NC	L	E	Secondary chamber (1800F, 1 sec), rapid gas quench system, wet scrubber system consisting of a packed bed absorber and venturi scrubber, and demister.	WS
20	59	59--2	Stericycle, Inc.	Unit 2	Haw River	NC	L	E	Secondary chamber (1800F, 1 sec), rapid gas quench system, wet scrubber system consisting of a packed bed absorber and venturi scrubber, and demister.	WS
21	60	60--1	BMWNC, Inc.	Unit 1	Matthews	NC	L	E	Secondary chamber (1641F), dry scrubber with lime and activated carbon injection, and baghouse	DIFF
22	65	65--1	Stericycle, Inc.	Unit 1	Clinton	IL	L	E	Secondary chamber (1800F), venturi scrubber, and condensing absorber	WS
23	65	65--2	Stericycle, Inc.	Unit 2	Clinton	IL	L	E	Secondary chamber (1800F), venturi scrubber, and condensing absorber	WS
24	71	71	Loyola University Medical Center		Maywood	IL	L	E	Two secondary chambers (1600F), twin rotary atomizer scrubber using 50% caustic solution, and two demister pads	WS
25	77	77	Parkview Hospital		Fort Wayne	IN	L	E	Secondary chamber and wet scrubber	WS
26	84	84	Mayo Clinic, Waste Management Facility		Rochester	MN	L	E	Secondary chamber (1800F, 1 sec) and baghouse with lime and carbon injection	DIFF
27	87	87	MedCentral Health System, Mansfield Hospital		Mansfield	OH	L	E	Secondary chamber (1800F, 2 sec) and baghouse with lime and carbon injection system	DIFF
28	94	94	Stericycle, Inc.		Warren	OH	L	E	Secondary chamber (1800F, 2 sec), wet scrubber	WS
29	98	98--1	University of Texas Medical Branch		Galveston	TX	L	E	Secondary chamber, packed tower, and venturi scrubber with activated carbon injection	WS

Table 20. Nationwide Cost Effectiveness for Existing Sources

No.	FACID	UNITID	Facility name	Unit number	City	State	Category	New/ existing	APCD description	APCD code
30	106	106	Stericycle, Inc.		Kansas City	KS	L	E	Secondary chamber (1800F, 2 sec), wet scrubber	WS
31	109	109	Healthcare Environmental Services Inc.		Fargo	ND	L	E	Secondary chamber (1800F) and dry scrubber/baghouse system with lime and carbon injection	DIFF
32	110	110	Stericycle, Inc.		North Salt Lake	UT	L	E	Secondary chamber (1834F), carbon injection system, ESP, dry scrubber, and wet gas absorber	DI-ESP/WS
33	120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	Anahuac	TX	L	N	Secondary chamber, baghouse with virgin lime injection, urea injection, and activated carbon injection	DIFF
34	120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	Anahuac	TX	L	N	Secondary chamber, baghouse with virgin lime injection, urea injection, and activated carbon injection	DIFF
35	125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		Greenville	NC	L	N	Secondary chamber (1985F), rotary atomizing wet scrubber (with NaOH scrubbing medium), carbon bed adsorber, HEPA filtering system, and heat recovery system	CA/WS
36	130	130	Department of Veterans Affairs Medical Center		Miami	FL	L	E	Secondary chamber (1800F, 1 sec), venturi scrubber, and packed tower absorber	WS
37	13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		Baltimore	MD	M	E	Secondary chamber (1832F) and venturi caustic scrubber with packed-bed scrubber	WS
38	16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		Baltimore	MD	M	E	Secondary chamber (1800F) and venturi wet scrubber followed by saturation chamber and mist eliminator	WS
39	18	18	Franklin Square Hospital Center		Baltimore	MD	M	E	Secondary chamber (1800F) and venturi scrubber followed by quench chamber and mist eliminator	WS
40	21	21	Washington County Hospital		Hagerstown	MD	M	E	Secondary chamber and venturi caustic scrubber	WS
41	25	25	Holy Spirit Hospital		Camp Hill	PA	M	E	Secondary chamber (1800F) and venturi scrubber with prequench and NaOH injection	WS
42	30	30	Riddle Memorial Hospital		Media	PA	M	E	Secondary chamber (1800F, 2 sec), caustic packed tower scrubber, and high pressure venturi, with activated carbon injection	WS
43	34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		State College	PA	M	E	Secondary chamber (1900F) and rotary atomizing wet scrubber with demister	WS
44	38	38	Wilkes-Barre General Hospital		Wilkes-Barre	PA	M	N	Secondary/tertiary chambers (1800F, 2.85 sec) and dry scrubber/baghouse with lime and activated carbon injection	DIFF
45	41	41	Thomas Memorial Hospital		South Charleston	WV	M	E	Secondary chamber (1800F) and venturi packed tower wet scrubber with caustic injection	WS
46	47	47	Malcolm Randall Veterans Affairs Medical Center		Gainesville	FL	M	E	Secondary chamber (1800F, 1 sec) and wet scrubber with caustic soda injection	WS

Table 20. Nationwide Cost Effectiveness for Existing Sources

No.	FACID	UNITID	Facility name	Unit number	City	State	Category	New/ existing	APCD description	APCD code
47	63	63	St. Jude Children's Research Hospital		Memphis	TN	M	E	Secondary chamber (1528F) and baghouse with sodium bicarbonate and carbon injection	DIFF
48	81	81	South Bend Medical Foundation		South Bend	IN	M	E	Secondary chamber and wet scrubber	WS
49	82	82	Good Samaritan Hospital		Vincennes	IN	M	E	Secondary chamber and multi-chamber spray scrubber	WS
50	88	88	Medina General Hospital		Medina	OH	M	E	Secondary chamber (1800F, 1 sec) and wet scrubber	WS
51	95	95	St. Joseph's Hospital		Marshfield	WI	M	E	Secondary chamber (1800F), quench tower, and baghouse with lime/carbon injection	DIFF
52	108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	Hamilton	MT	M	E	Secondary chamber and wet scrubber	WS
53	111	111	Wyoming Medical Center		Casper	WY	M	E	Secondary chamber and wet scrubber	WS
54	86	86	Fairfield Medical Center		Lancaster	OH	S	E	Secondary chamber (1800F, 1 sec) and wet scrubber	WS
55	129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	Atlanta	GA	S	N	Secondary chamber (1800F, 1.68 sec) and rotary atomizing wet scrubber	WS
56	115	115	Kona Community Hospital		Kealahou	HI	SR	E	Secondary chamber (1900F, 2 sec), no APCD	CC
57	116	116	Yukon-Kuskokwim Delta Regional Hospital		Bethel	AK	SR	E	Secondary chamber, no APCD	CC
Large units										
Medium units										
Small units										
Small rural units										
Overall										

Table 20. Nationwide Cost Effectiveness for Existi

No.	FACID	UNITID	Facility name	Unit number	MACT floor controls	APCD code with MACT floor controls	MACT floor		
							Cost (\$/yr)	Emission reduction (lb/yr)	Unit average cost effectiveness (\$/ton)
1	1	1	Bristol-Myers Squibb Co.		replace FF with DIFF; add packed-bed scrubber and ACI	DIFF/WS	\$175,240	1,681	\$208,448
2	5	5	Merck & Company, Inc.		improve FF performance, add ACI	DIFF	\$129,140	0	\$869,610,370
3	15	15--1	Curtis Bay Energy	Unit 1	improve FF performance; add packed-bed scrubber, ACI, and SNCR	DIFF/WS	\$1,659,938	176,084	\$18,854
4	15	15--2	Curtis Bay Energy	Unit 2	add packed-bed scrubber, ACI, and SNCR	DIFF/WS	\$1,764,739	189,697	\$18,606
5	20	20--1	Fort Detrick	Unit 5	add DIFF, caustic, and ACI	DIFF/WS	\$264,412	46.5	\$11,362,967
6	20	20--2	Fort Detrick	Unit 6	add DIFF, caustic, and ACI	DIFF/WS	\$252,734	58.7	\$8,617,820
7	29	29	Hamot Medical Center		add packed-bed scrubber; increase activated carbon	DIFF/WS	\$145,956	563	\$518,067
8	36	36--1	Merck & Company, Inc.	Unit 2	add packed-bed scrubber and ACI	DIFF/WS	\$224,986	30.2	\$14,889,452
9	36	36--2	Merck & Company, Inc.	Unit 5	add packed-bed scrubber and ACI	DIFF/WS	\$340,732	249	\$2,738,938
10	40	40	Charleston Area Medical Center, General Hospital		increase natural gas; add packed-bed scrubber	DIFF/WS	\$152,243	627	\$485,454
11	42	42	Stericycle, Inc.		secondary chamber retrofit; replace DIFF; add packed-bed scrubber; increase activated carbon; only minor adjustment of system to obtain additional NO _x control (marginal difference in NO _x)	DIFF/WS	\$728,998	8,854	\$164,670
12	43	43	Boca Raton Community Hospital		secondary chamber retrofit; add DIFF, caustic, and ACI	DIFF/WS	\$271,443	956	\$567,972
13	44	44	Bethesda Memorial Hospital		add DIFF, caustic, and ACI	DIFF/WS	\$477,002	709	\$1,344,883
14	46	46	Holy Cross Hospital		increase natural gas; add DIFF and ACI	DIFF/WS	\$385,098	446	\$1,725,882
15	48	48	Memorial Regional Hospital		add DIFF, caustic, and ACI; only minor adjustment of system to obtain additional NO _x control (marginal difference in NO _x)	DIFF/WS	\$480,619	1,205	\$797,476

Table 20. Nationwide Cost Effectiveness for Existi

No.	FACID	UNITID	Facility name	Unit number	MACT floor controls	APCD code with MACT floor controls	MACT floor		
							Cost (\$/yr)	Emission reduction (lb/yr)	Unit average cost effectiveness (\$/ton)
16	51	51	Lakeland Regional Medical Center		secondary chamber retrofit; replace DIFF; increase lime; add ACI	DIFF	\$292,756	202	\$2,891,902
17	54	54	Bayfront Medical Center		secondary chamber retrofit; add DIFF and ACI; only minor adjustment of system needed to obtain additional NO _x control (marginal difference in NO _x)	DIFF/WS	\$370,166	227	\$3,257,224
18	55	55	St. Joseph's Hospital		increase natural gas, replace DIFF; add packed-bed scrubber and ACI	DIFF/WS	\$322,586	1,093	\$590,331
19	59	59--1	Stericycle, Inc.	Unit 1	increase natural gas; add DIFF, caustic, and ACI	DIFF/WS	\$453,735	805	\$1,127,943
20	59	59--2	Stericycle, Inc.	Unit 2	increase natural gas; add DIFF, caustic, and ACI	DIFF/WS	\$444,582	1,681	\$529,032
21	60	60--1	BMWNC, Inc.	Unit 1	secondary chamber retrofit; add packed-bed scrubber; increase activated carbon	DIFF/WS	\$395,473	9,875	\$80,097
22	65	65--1	Stericycle, Inc.	Unit 1	secondary chamber retrofit; add DIFF, caustic, and ACI	DIFF/WS	\$418,077	1,723	\$485,176
23	65	65--2	Stericycle, Inc.	Unit 2	increase natural gas; add DIFF, caustic, and ACI	DIFF/WS	\$356,776	867	\$823,149
24	71	71	Loyola University Medical Center		secondary chamber retrofit; add DIFF and ACI	DIFF/WS	\$445,769	917	\$971,964
25	77	77	Parkview Hospital		increase natural gas; add DIFF, caustic, and ACI	DIFF/WS	\$319,813	1,306	\$489,756
26	84	84	Mayo Clinic, Waste Management Facility		replace DIFF; add packed-bed scrubber; increase activated carbon; add SNCR	DIFF/WS	\$658,763	12,353	\$106,660
27	87	87	MedCentral Health System, Mansfield Hospital		increase natural gas; replace DIFF; add packed-bed scrubber; increase activated carbon	DIFF/WS	\$222,524	1,055	\$422,009
28	94	94	Stericycle, Inc.		increase natural gas; add DIFF, caustic, and ACI	DIFF/WS	\$316,614	199	\$3,187,388
29	98	98--1	University of Texas Medical Branch		add DIFF and ACI	DIFF/WS	\$476,163	1,957	\$486,710

Table 20. Nationwide Cost Effectiveness for Existi

No.	FACID	UNITID	Facility name	Unit number	MACT floor controls	APCD code with MACT floor controls	MACT floor		
							Cost (\$/yr)	Emission reduction (lb/yr)	Unit average cost effectiveness (\$/ton)
30	106	106	Stericycle, Inc.		increase natural gas; add DIFF, caustic, and ACI	DIFF/WS	\$407,229	878	\$927,159
31	109	109	Healthcare Environmental Services Inc.		secondary chamber retrofit; replace DIFF; add packed-bed scrubber and SNCR; increase activated carbon	DIFF/WS	\$549,403	6,417	\$171,227
32	110	110	Stericycle, Inc.		secondary chamber retrofit; add FF; increase sodium bicarbonate and activated carbon; add SNCR	DIFF-ESP/WS	\$863,840	27,355	\$63,158
33	120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	increase natural gas; replace DIFF; add packed-bed scrubber; increase activated carbon	DIFF/WS	\$910,010	3,695	\$492,602
34	120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	replace DIFF; add packed-bed scrubber	DIFF/WS	\$653,796	3,192	\$409,594
35	125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		secondary chamber retrofit	CA/WS	\$64,998	51.9	\$2,503,005
36	130	130	Department of Veterans Affairs Medical Center		add DIFF and caustic	DIFF/WS	\$570,006	3,127	\$364,617
37	13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		add DIFF and ACI	DIFF/WS	\$252,000	26.6	\$18,923,744
38	16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		secondary chamber retrofit; add DIFF, caustic, and ACI	DIFF/WS	\$270,996	466	\$1,161,986
39	18	18	Franklin Square Hospital Center		secondary chamber retrofit; add DIFF, packed-bed scrubber, and ACI	DIFF/WS	\$531,932	3,418	\$311,266
40	21	21	Washington County Hospital		secondary chamber retrofit; add DIFF, packed-bed scrubber, and ACI	DIFF/WS	\$335,952	490	\$1,371,370
41	25	25	Holy Spirit Hospital		add DIFF, caustic, and ACI	DIFF/WS	\$220,317	305	\$1,446,342
42	30	30	Riddle Memorial Hospital		add DIFF and ACI	DIFF/WS	\$222,578	20.8	\$21,444,177
43	34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		add FF	FF/WS	\$196,743	222	\$1,774,109
44	38	38	Wilkes-Barre General Hospital		add packed-bed scrubber; increase activated carbon	DIFF/WS	\$93,436	243	\$769,080
45	41	41	Thomas Memorial Hospital		add DIFF, caustic, and ACI	DIFF/WS	\$196,506	396	\$991,669
46	47	47	Malcolm Randall Veterans Affairs Medical Center		secondary chamber retrofit; add DIFF, packed-bed scrubber, and ACI	DIFF/WS	\$302,299	252	\$2,398,500

Table 20. Nationwide Cost Effectiveness for Existi

No.	FACID	UNITID	Facility name	Unit number	MACT floor controls	APCD code with MACT floor controls	MACT floor		
							Cost (\$/yr)	Emission reduction (lb/yr)	Unit average cost effectiveness (\$/ton)
47	63	63	St. Jude Children's Research Hospital		add packed-bed scrubber; increase activated carbon	DIFF/WS	\$103,659	250	\$829,661
48	81	81	South Bend Medical Foundation		add DIFF, packed-bed scrubber, and ACI	DIFF/WS	\$385,394	630	\$1,223,126
49	82	82	Good Samaritan Hospital		add DIFF, caustic, and ACI	DIFF/WS	\$177,757	72.0	\$4,934,280
50	88	88	Medina General Hospital		secondary chamber retrofit; add DIFF, caustic, and ACI	DIFF/WS	\$170,995	644	\$531,239
51	95	95	St. Joseph's Hospital		add packed-bed scrubber; increase activated carbon	DIFF/WS	\$75,742	27.9	\$5,438,759
52	108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	add FF	FF/WS	\$167,589	185	\$1,812,749
53	111	111	Wyoming Medical Center		increase natural gas; add DIFF and ACI	DIFF/WS	\$199,070	1.95	\$203,785,482
54	86	86	Fairfield Medical Center		add caustic and ACI	WS	\$24,644	37.3	\$1,320,127
55	129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	secondary chamber retrofit, add caustic	WS	\$19,099	43.1	\$885,839
56	115	115	Kona Community Hospital		none	CC	\$22,413	0	
57	116	116	Yukon-Kuskokwim Delta Regional Hospital		add DIFF and ACI	DIFF	\$190,471	0.283	\$1,347,165,493
Large units							\$16,966,359	460,183	\$25,929,182
Medium units							\$3,902,966	7,650	\$15,832,208
Small units							\$43,743	80.5	\$1,102,983
Small rural units							\$212,884	0.283	\$1,347,165,493
Overall							\$21,125,952	467,914	\$45,570,885

Table 20. Nationwide Cost Effectiveness for Existi

No.	FACID	UNITID	Facility name	Unit number	Beyond-the-floor controls	APCD code with MACT floor and BTF controls	From MACT floor to beyond-the-floor		
							Cost (\$/yr)	Emission reduction (lb/yr)	Unit average cost effectiveness (\$/ton)
1	1	1	Bristol-Myers Squibb Co.		improve FF performance; add caustic; increase activated carbon; add SNCR	FF/WS	\$52,210	1,072	\$97,401
2	5	5	Merck & Company, Inc.		replace DIFF (in place of improving FF performance); add packed-bed scrubber; increase activated carbon; add SNCR	DIFF/WS	\$1,024,476	8,804	\$232,734
3	15	15--1	Curtis Bay Energy	Unit 1	replace DIFF (in place of improving FF performance); add caustic; increase activated carbon and NO _x reagent	DIFF/WS	\$2,651,566	41,096	\$129,042
4	15	15--2	Curtis Bay Energy	Unit 2	minor adjustment of system to obtain additional CO control (marginal difference in CO); replace DIFF; add caustic; increase activated carbon and NO _x reagent	DIFF/WS	\$2,993,085	43,152	\$138,722
5	20	20--1	Fort Detrick	Unit 5	improve FF performance; add more caustic; increase activated carbon; add SNCR	DIFF/WS	\$75,314	1,231	\$122,350
6	20	20--2	Fort Detrick	Unit 6	improve FF performance; add more caustic; increase activated carbon; add SNCR	DIFF/WS	\$71,865	1,162	\$123,699
7	29	29	Hamot Medical Center		replace DIFF; add caustic; further increase activated carbon; add SNCR	DIFF/WS	\$428,536	1,185	\$723,521
8	36	36--1	Merck & Company, Inc.	Unit 2	replace DIFF; add caustic; increase activated carbon; add SNCR	DIFF/WS	\$603,548	968	\$1,247,004
9	36	36--2	Merck & Company, Inc.	Unit 5	replace DIFF; add caustic; increase activated carbon; add SNCR	DIFF/WS	\$932,758	10,273	\$181,599
10	40	40	Charleston Area Medical Center, General Hospital		add more natural gas; replace DIFF; add caustic; increase activated carbon; add SNCR	DIFF/WS	\$534,087	1,161	\$920,392
11	42	42	Stericycle, Inc.		add natural gas; improve FF performance; add caustic; further increase activated carbon; add SNCR (in place of minor adjustment of system)	DIFF/WS	\$264,787	8,553	\$61,918
12	43	43	Boca Raton Community Hospital		add natural gas; improve FF performance; add more caustic; increase activated carbon; add SNCR	DIFF/WS	\$80,681	7,142	\$22,593
13	44	44	Bethesda Memorial Hospital		improve FF performance; add more caustic; increase activated carbon; add SNCR	DIFF/WS	\$138,262	3,856	\$71,708
14	46	46	Holy Cross Hospital		secondary chamber retrofit (in place of increasing natural gas); improve FF performance; add caustic; increase activated carbon; add SNCR	DIFF/WS	\$146,490	2,112	\$138,692
15	48	48	Memorial Regional Hospital		improve FF performance; add more caustic; increase activated carbon; add SNCR (in place of minor adjustment of system)	DIFF/WS	\$139,179	4,660	\$59,732

Table 20. Nationwide Cost Effectiveness for Existi

No.	FACID	UNITID	Facility name	Unit number	Beyond-the-floor controls	APCD code with MACT floor and BTF controls	From MACT floor to beyond-the-floor		
							Cost (\$/yr)	Emission reduction (lb/yr)	Unit average cost effectiveness (\$/ton)
16	51	51	Lakeland Regional Medical Center		add natural gas; improve FF performance; add packed-bed scrubber (in place of increasing lime); increase activated carbon; add SNCR	DIFF/WS	\$202,241	4,320	\$93,638
17	54	54	Bayfront Medical Center		add natural gas; improve FF performance; add caustic; increase activated carbon; add SNCR	DIFF/WS	\$111,305	1,960	\$113,599
18	55	55	St. Joseph's Hospital		secondary chamber retrofit (in place of increasing natural gas); improve FF performance; add caustic; increase activated carbon; add SNCR	DIFF/WS	\$145,164	6,848	\$42,398
19	59	59--1	Stericycle, Inc.	Unit 1	add more natural gas; improve FF performance; add more caustic; increase activated carbon; add SNCR	DIFF/WS	\$152,531	12,505	\$24,395
20	59	59--2	Stericycle, Inc.	Unit 2	add more natural gas; improve FF performance; add more caustic; increase activated carbon; add SNCR	DIFF/WS	\$149,378	12,181	\$24,526
21	60	60--1	BMWNC, Inc.	Unit 1	add natural gas; replace DIFF; add caustic; further increase activated carbon; add SNCR	DIFF/WS	\$827,864	11,929	\$138,794
22	65	65--1	Stericycle, Inc.	Unit 1	add natural gas; improve FF performance; add more caustic; increase activated carbon; add SNCR	DIFF/WS	\$126,500	9,140	\$27,682
23	65	65--2	Stericycle, Inc.	Unit 2	secondary chamber retrofit (in place of increasing natural gas); improve FF performance; add more caustic; increase activated carbon; add SNCR	DIFF/WS	\$135,726	8,585	\$31,619
24	71	71	Loyola University Medical Center		add natural gas; improve FF performance; add packed-bed scrubber; increase activated carbon; add SNCR	DIFF/WS	\$226,512	5,291	\$85,620
25	77	77	Parkview Hospital		secondary chamber retrofit (in place of increasing natural gas); improve FF performance; add packed-bed scrubber (in place of adding caustic); increase activated carbon; add SNCR	DIFF/WS	\$192,423	8,950	\$43,001
26	84	84	Mayo Clinic, Waste Management Facility		improve FF performance; add caustic; further increase activated carbon; increase NO _x reagent	DIFF/WS	\$86,469	6,669	\$25,932
27	87	87	MedCentral Health System, Mansfield Hospital		add more natural gas; improve FF performance; add caustic; further increase activated carbon; add SNCR	DIFF/WS	\$90,890	2,213	\$82,137
28	94	94	Stericycle, Inc.		add more natural gas; improve FF performance; add more caustic; increase activated carbon; add SNCR	DIFF/WS	\$105,297	7,829	\$26,900
29	98	98--1	University of Texas Medical Branch		improve FF performance; add caustic; further increase activated carbon; add SNCR	DIFF/WS	\$138,184	6,029	\$45,841

Table 20. Nationwide Cost Effectiveness for Existi

No.	FACID	UNITID	Facility name	Unit number	Beyond-the-floor controls	APCD code with MACT floor and BTF controls	From MACT floor to beyond-the-floor		
							Cost (\$/yr)	Emission reduction (lb/yr)	Unit average cost effectiveness (\$/ton)
30	106	106	Stericycle, Inc.		add more natural gas; improve FF performance; add more caustic; increase activated carbon; add SNCR	DIFF/WS	\$140,021	11,127	\$25,168
31	109	109	Healthcare Environmental Services Inc.		add natural gas; improve FF performance; add caustic; further increase activated carbon; increase NO _x reagent	DIFF/WS	\$93,245	1,439	\$129,631
32	110	110	Stericycle, Inc.		add natural gas; improve FF performance; add more sodium bicarbonate; further increase activated carbon; increase NO _x reagent	DIFF-ESP/WS	\$259,230	9,852	\$52,624
33	120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	add more natural gas; improve FF performance; add caustic; further increase activated carbon; add SNCR	DIFF/WS	\$377,684	14,214	\$53,143
34	120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	improve FF performance; add caustic; increase activated carbon; add SNCR	DIFF/WS	\$273,902	15,241	\$35,942
35	125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		add natural gas and caustic; increase activated carbon; add SNCR	CA/WS	\$114,876	396	\$579,896
36	130	130	Department of Veterans Affairs Medical Center		improve FF performance; add more caustic; add ACI and SNCR	DIFF/WS	\$224,115	6,634	\$67,563
37	13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		improve FF performance; increase activated carbon; add SNCR	DIFF/WS	\$65,786	1,074	\$122,498
38	16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		add natural gas; improve FF performance; add more caustic; increase activated carbon; add SNCR	DIFF/WS	\$67,970	853	\$159,381
39	18	18	Franklin Square Hospital Center		add natural gas; improve FF performance; add caustic; increase activated carbon; add SNCR	DIFF/WS	\$105,621	6,286	\$33,604
40	21	21	Washington County Hospital		add natural gas; improve FF performance; add caustic; increase activated carbon; add SNCR	DIFF/WS	\$65,302	2,243	\$58,222
41	25	25	Holy Spirit Hospital		improve FF performance; add more caustic; increase activated carbon; add SNCR	DIFF/WS	\$56,567	3,307	\$34,206
42	30	30	Riddle Memorial Hospital		improve FF performance; add caustic; further increase activated carbon; add SNCR	DIFF/WS	\$58,186	2,457	\$47,359
43	34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		increase natural gas; improve FF performance; add packed-bed scrubber; add SNCR	FF/WS	\$145,422	917	\$317,339
44	38	38	Wilkes-Barre General Hospital		increase natural gas; add caustic; further increase activated carbon; add SNCR	DIFF/WS	\$63,991	3,308	\$38,693
45	41	41	Thomas Memorial Hospital		improve FF performance; add more caustic; increase activated carbon; add SNCR	DIFF/WS	\$52,059	1,232	\$84,527
46	47	47	Malcolm Randall Veterans Affairs Medical Center		add natural gas; improve FF performance; add caustic; increase activated carbon; add SNCR	DIFF/WS	\$59,929	2,101	\$57,049

Table 20. Nationwide Cost Effectiveness for Existi

No.	FACID	UNITID	Facility name	Unit number	Beyond-the-floor controls	APCD code with MACT floor and BTF controls	From MACT floor to beyond-the-floor		
							Cost (\$/yr)	Emission reduction (lb/yr)	Unit average cost effectiveness (\$/ton)
47	63	63	St. Jude Children's Research Hospital		add caustic; further increase activated carbon; add SNCR	DIFF/WS	\$67,265	1,198	\$112,284
48	81	81	South Bend Medical Foundation		increase natural gas; improve FF performance; add caustic; increase activated carbon; add SNCR	DIFF/WS	\$81,958	382	\$429,562
49	82	82	Good Samaritan Hospital		minor adjustment of system to obtain additional CO control (marginal difference in CO); improve FF performance; add more caustic; increase activated carbon; add SNCR	DIFF/WS	\$45,562	1,634	\$55,778
50	88	88	Medina General Hospital		add natural gas; improve FF performance; add more caustic; increase activated carbon; add SNCR	DIFF/WS	\$42,228	1,741	\$48,503
51	95	95	St. Joseph's Hospital		increase natural gas; add caustic; further increase activated carbon; add SNCR	DIFF/WS	\$52,255	885	\$118,024
52	108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	increase natural gas; add DIFF (in place of FF); improve FF performance; add caustic, ACI, and SNCR	DIFF/WS	\$119,469	1,367	\$174,825
53	111	111	Wyoming Medical Center		add more natural gas; improve FF performance; add caustic; increase activated carbon; add SNCR	DIFF/WS	\$55,173	1,000	\$110,324
54	86	86	Fairfield Medical Center		increase natural gas; add DIFF; add more caustic; increase activated carbon; add SNCR	DIFF/WS	\$297,175	2,809	\$211,597
55	129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	increase natural gas; add DIFF; add more caustic; add ACI and SNCR	DIFF/WS	\$206,934	945	\$438,069
56	115	115	Kona Community Hospital		add DIFF, packed-bed scrubber, ACI, and SNCR	DIFF/WS	\$302,157	270	\$2,238,729
57	116	116	Yukon-Kuskokwim Delta Regional Hospital		improve FF performance; add packed-bed scrubber; increase activated carbon; add SNCR	DIFF/WS	\$83,721	550	\$304,321
Large units							\$14,310,403	299,778	\$167,254
Medium units							\$1,204,743	31,985	\$117,775
Small units							\$504,110	3,754	\$324,833
Small rural units							\$385,878	820	\$1,271,525
Overall							\$16,405,135	336,337	\$196,773

Table 20. Nationwide Cost Effectiveness for Existi

No.	FACID	UNITID	Facility name	Unit number	MACT floor + beyond-the-floor		
					Cost (\$/yr)	Emission reduction (lb/yr)	Unit average cost effectiveness (\$/ton)
1	1	1	Bristol-Myers Squibb Co.		\$227,449	2,753	\$165,212
2	5	5	Merck & Company, Inc.		\$1,153,616	8,804	\$262,062
3	15	15--1	Curtis Bay Energy	Unit 1	\$4,311,504	217,180	\$39,704
4	15	15--2	Curtis Bay Energy	Unit 2	\$4,757,823	232,849	\$40,866
5	20	20--1	Fort Detrick	Unit 5	\$339,726	1,278	\$531,792
6	20	20--2	Fort Detrick	Unit 6	\$324,599	1,221	\$531,874
7	29	29	Hamot Medical Center		\$574,493	1,748	\$657,295
8	36	36--1	Merck & Company, Inc.	Unit 2	\$828,534	998	\$1,660,027
9	36	36--2	Merck & Company, Inc.	Unit 5	\$1,273,489	10,522	\$242,074
10	40	40	Charleston Area Medical Center, General Hospital		\$686,331	1,788	\$767,800
11	42	42	Stericycle, Inc.		\$993,785	17,407	\$114,183
12	43	43	Boca Raton Community Hospital		\$352,124	8,098	\$86,966
13	44	44	Bethesda Memorial Hospital		\$615,264	4,566	\$269,522
14	46	46	Holy Cross Hospital		\$531,588	2,559	\$415,514
15	48	48	Memorial Regional Hospital		\$619,798	5,865	\$211,338

Table 20. Nationwide Cost Effectiveness for Existi

No.	FACID	UNITID	Facility name	Unit number	MACT floor + beyond-the-floor		
					Cost (\$/yr)	Emission reduction (lb/yr)	Unit average cost effectiveness (\$/ton)
16	51	51	Lakeland Regional Medical Center		\$494,997	4,522	\$218,923
17	54	54	Bayfront Medical Center		\$481,471	2,187	\$440,323
18	55	55	St. Joseph's Hospital		\$467,750	7,941	\$117,812
19	59	59--1	Stericycle, Inc.	Unit 1	\$606,266	13,310	\$91,101
20	59	59--2	Stericycle, Inc.	Unit 2	\$593,961	13,862	\$85,697
21	60	60--1	BMWNC, Inc.	Unit 1	\$1,223,337	21,804	\$112,211
22	65	65--1	Stericycle, Inc.	Unit 1	\$544,578	10,863	\$100,263
23	65	65--2	Stericycle, Inc.	Unit 2	\$492,503	9,452	\$104,211
24	71	71	Loyola University Medical Center		\$672,282	6,208	\$216,573
25	77	77	Parkview Hospital		\$512,236	10,256	\$99,893
26	84	84	Mayo Clinic, Waste Management Facility		\$745,232	19,022	\$78,357
27	87	87	MedCentral Health System, Mansfield Hospital		\$313,414	3,268	\$191,824
28	94	94	Stericycle, Inc.		\$421,911	8,027	\$105,117
29	98	98--1	University of Texas Medical Branch		\$614,347	7,986	\$153,865

Table 20. Nationwide Cost Effectiveness for Existi

No.	FACID	UNITID	Facility name	Unit number	MACT floor + beyond-the-floor		
					Cost (\$/yr)	Emission reduction (lb/yr)	Unit average cost effectiveness (\$/ton)
30	106	106	Stericycle, Inc.		\$547,250	12,005	\$91,169
31	109	109	Healthcare Environmental Services Inc.		\$642,649	7,856	\$163,610
32	110	110	Stericycle, Inc.		\$1,123,069	37,207	\$60,369
33	120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	\$1,287,694	17,909	\$143,808
34	120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	\$927,698	18,434	\$100,651
35	125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		\$179,874	448	\$802,776
36	130	130	Department of Veterans Affairs Medical Center		\$794,121	9,761	\$162,716
37	13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		\$317,786	1,101	\$577,420
38	16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		\$338,966	1,319	\$513,833
39	18	18	Franklin Square Hospital Center		\$637,552	9,704	\$131,399
40	21	21	Washington County Hospital		\$401,254	2,733	\$293,619
41	25	25	Holy Spirit Hospital		\$276,884	3,612	\$153,309
42	30	30	Riddle Memorial Hospital		\$280,764	2,478	\$226,607
43	34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		\$342,165	1,138	\$601,184
44	38	38	Wilkes-Barre General Hospital		\$157,427	3,551	\$88,677
45	41	41	Thomas Memorial Hospital		\$248,565	1,628	\$305,346
46	47	47	Malcolm Randall Veterans Affairs Medical Center		\$362,228	2,353	\$307,880

Table 20. Nationwide Cost Effectiveness for Existi

No.	FACID	UNITID	Facility name	Unit number	MACT floor + beyond-the-floor		
					Cost (\$/yr)	Emission reduction (lb/yr)	Unit average cost effectiveness (\$/ton)
47	63	63	St. Jude Children's Research Hospital		\$170,925	1,448	\$236,081
48	81	81	South Bend Medical Foundation		\$467,353	1,012	\$923,833
49	82	82	Good Samaritan Hospital		\$223,319	1,706	\$261,846
50	88	88	Medina General Hospital		\$213,223	2,385	\$178,801
51	95	95	St. Joseph's Hospital		\$127,997	913	\$280,281
52	108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	\$287,058	1,552	\$370,009
53	111	111	Wyoming Medical Center		\$254,243	1,002	\$507,397
54	86	86	Fairfield Medical Center		\$321,820	2,846	\$226,138
55	129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	\$226,034	988	\$457,614
56	115	115	Kona Community Hospital		\$324,570	270	\$2,404,793
57	116	116	Yukon-Kuskokwim Delta Regional Hospital		\$274,192	551	\$996,156
Large units					\$31,276,762	759,961	\$267,708
Medium units					\$5,107,709	39,635	\$350,442
Small units					\$547,853	3,834	\$341,876
Small rural units					\$598,762	820	\$1,700,474
Overall					\$37,531,087	804,251	\$345,258

Table 21. HMIWI Sales and Employment

No.	FACID	UNITID	Facility name	Unit number	Previous facility name	Location address	City	State	Zip code	County	SIC primary	NAICS primary
1	54	54	Bayfront Medical Center		NA	701 6th Street S.	St. Petersburg	FL	33701	Pinellas County	8062	622110
2	44	44	Bethesda Memorial Hospital		NA	2815 S. Seacrest Boulevard	Boynton Beach	FL	33435	Palm Beach County	8062	622110
3	60	60--1	BMWNC, Inc.	Unit 1	Bio-Medical Services, Inc.	3250 Campus Ridge Road	Matthews	NC	28105	Mecklenburg County	4953	562213
4	43	43	Boca Raton Community Hospital		NA	800 Meadows Road	Boca Raton	FL	33486	Palm Beach County	8062	622110
5	1	1	Bristol-Myers Squibb Co.		Bristol-Myers Co.	5 Research Parkway, P.O. Box 5100	Wallingford	CT	06492	New Haven County	2834	325412
6	129	129	Centers For Disease Control And Prevention, Building 18	Unit 3	NA	1600 Clifton Road, N.E.	Atlanta	GA	30333	Dekalb County	9431	923120
7	40	40	Charleston Area Medical Center, General Hospital		NA	501 Morris Street	Charleston	WV	25301	Kanawha County	8062	622110
8	15	15--1	Curtis Bay Energy	Unit 1	Phoenix Services, Inc.; Medical Waste Associates, Inc.	3200 Hawkins Point Road	Baltimore	MD	21226	Baltimore City	4953	562213
9	15	15--2	Curtis Bay Energy	Unit 2	Phoenix Services, Inc.; Medical Waste Associates, Inc.	3200 Hawkins Point Road	Baltimore	MD	21226	Baltimore City	4953	562213
10	130	130	Department Of Veterans Affairs Medical Center			1201 N.W. 16th Street	Miami	FL	33125	Miami-Dade County	8062	622110
11	125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		NA	600 Moye Boulevard	Greenville	NC	27834	Pitt County	8221	611310
12	86	86	Fairfield Medical Center		Lancaster-Fairfield Community Hospital	401 N. Ewing Street	Lancaster	OH	43130	Fairfield County	8062	622110
13	20	20--1	Fort Detrick	Unit 5	NA	Incinerator Complex, Building 393	Fort Detrick	MD	21702	Frederick County	9711	928110
14	20	20--2	Fort Detrick	Unit 6	NA	Incinerator Complex, Building 393	Fort Detrick	MD	21702	Frederick County	9711	928110
15	18	18	Franklin Square Hospital Center		NA	9000 Franklin Square Drive	Baltimore	MD	21237	Baltimore County	8062	622110
16	82	82	Good Samaritan Hospital		NA	520 S. Seventh Street	Vincennes	IN	47591	Knox County	8062	622110
17	29	29	Hamot Medical Center		NA	201 State Street	Erie	PA	16550	Erie County	8062	622110
18	109	109	Healthcare Environmental Services Inc.		NA	1420 40th Street N.	Fargo	ND	58102	Cass County	4953	562213
19	46	46	Holy Cross Hospital		NA	4725 N. Federal Highway	Fort Lauderdale	FL	33308	Broward County	8062	622110
20	25	25	Holy Spirit Hospital		NA	503 N. 21st Street	Camp Hill	PA	17011	Cumberland County	8062	622110
21	16	16	Johns Hopkins Medical Institute, Department Of Health Safety and Environment		NA	2024 E. Monument Street; Ross Building, 720 Rutland Avenue	Baltimore	MD	21205	Baltimore City	8221	611310
22	115	115	Kona Community Hospital		NA	79-1019 Haukapila Street, P.O. Box 69	Kealahou	HI	96750	Hawaii County	8062	622110
23	51	51	Lakeland Regional Medical Center		NA	1324 Lakeland Hills Boulevard	Lakeland	FL	33804	Polk County	8062	622110
24	71	71	Loyola University Medical Center		NA	2160 S. First Avenue	Maywood	IL	60153	Cook County	8062	622110
25	47	47	Malcolm Randall Veterans Affairs Medical Center		NA	1601 S.W. Archer Road	Gainesville	FL	32608	Alachua County	8062	622110
26	84	84	Mayo Clinic, Waste Management Facility		NA	7123 L.C. Industrial Park, Rochester Municipal Airport	Rochester	MN	55905	Olmsted County	8062	622110
27	87	87	Medcentral Health System, Mansfield Hospital		Mansfield General Hospital	335 Glessner Avenue	Mansfield	OH	44903	Richland County	8062	622110
28	88	88	Medina General Hospital		NA	1000 E. Washington Street	Medina	OH	44256	Medina County	8062	622110
29	48	48	Memorial Regional Hospital		Hollywood Memorial Hospital	3501 Johnson Street	Hollywood	FL	33021	Broward County	8062	622110
31	5	5	Merck & Company, Inc.		NA	126 E. Lincoln Avenue	Rahway	NJ	07065	Union County	2833	325411
30	36	36--1	Merck & Company, Inc.	Unit 2	NA	770 Sumneytown Pike, P.O. Box 4	West Point (Upper Gwynedd Township)	PA	19486	Montgomery County	2834	325412
32	36	36--2	Merck & Company, Inc.	Unit 5	NA	770 Sumneytown Pike, P.O. Box 4	West Point (Upper Gwynedd Township)	PA	19486	Montgomery County	2834	325412
34	120	120--1	Municipality Of Chambers County, Resource Recovery Center	Unit 1	NA	7501 State Highway 65	Anahuac	TX	77514	Chambers County	4953 / 9511	562213 / 924110
35	120	120--2	Municipality Of Chambers County, Resource Recovery Center	Unit 2	NA	7501 State Highway 65	Anahuac	TX	77514	Chambers County	4953 / 9511	562213 / 924110
36	77	77	Parkview Hospital		Parkview Memorial Hospital	2200 Randallia Drive	Fort Wayne	IN	46805	Allen County	8062	622110
37	34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		NA	159A Physical Plant Building, Orchard Road	State College	PA	16802	Centre County	8221	611310
38	30	30	Riddle Memorial Hospital		NA	1068 W. Baltimore Pike	Media	PA	19063	Delaware County	8062	622110
39	108	108--1	Rocky Mountain Laboratories, National Institute Of Allergy And Infectious Diseases	Unit 1	NA	903 S. 4th Street, Building 23	Hamilton	MT	59840	Ravalli County	8733	541710
40	81	81	South Bend Medical Foundation		NA	530 N. Lafayette Boulevard	South Bend	IN	46601	St. Joseph County	8062	622110

Table 21. HMIWI Sales and Employment

No.	FACID	UNITID	Facility name	Unit number	Previous facility name	Location address	City	State	Zip code	County	SIC primary	NAICS primary
41	55	55	St. Joseph's Hospital		NA	3001 W. Martin Luther King Jr. Boulevard	Tampa	FL	33607	Hillsborough County	8062	622110
42	95	95	St. Joseph's Hospital		NA	611 St. Joseph Avenue	Marshfield	WI	54449	Wood County	8062	622110
43	63	63	St. Jude Children's Research Hospital		NA	332 N. Lauderdale Street	Memphis	TN	38105	Shelby County	8069	622310
44	42	42	Stericycle, Inc.		BFI Medical Waste, Inc.	254 W. Keene Road	Apopka	FL	32703	Orange County	4953	562213
45	106	106	Stericycle, Inc.		BFI Medical Waste, Inc.	3150 N. 7th Street	Kansas City	KS	66115	Wyandotte County	4953	562213
46	94	94	Stericycle, Inc.		BFI Medical Waste, Inc.	1901 Pine Avenue S.E.	Warren	OH	44481	Trumbull County	4953	562213
47	110	110	Stericycle, Inc.		BFI Medical Waste, Inc.	90 N. 1100 W.	North Salt Lake	UT	84054	Davis County	4953	562213
49	65	65--1	Stericycle, Inc.	Unit 1	MedX, Inc.; BFI Medical Waste, Inc.	Rural Route 4, P.O. Box 243L	Clinton	IL	61727	Dewitt County	4953	562213
48	65	65--2	Stericycle, Inc.	Unit 2	MedX, Inc.; BFI Medical Waste, Inc.	Rural Route 4, P.O. Box 243L	Clinton	IL	61727	Dewitt County	4953	562213
49	59	59--1	Stericycle, Inc.	Unit 1	MedX, Inc.; BFI Medical Waste, Inc.	1168 Porter Avenue	Haw River	NC	27258	Alamance County	4953	562213
50	59	59--2	Stericycle, Inc.	Unit 2	MedX, Inc.; BFI Medical Waste, Inc.	1168 Porter Avenue	Haw River	NC	27258	Alamance County	4953	562213
51	41	41	Thomas Memorial Hospital		NA	4605 MacCorkle Avenue S.W.	South Charleston	WV	25309	Kanawha County	8062	622110
52	13	13	University Of Maryland At Baltimore, Environmental Health and Safety Facility		NA	714 W. Lombard Street	Baltimore	MD	21201	Baltimore City	8221	611310
53	98	98--1	University Of Texas Medical Branch		NA	301 University Boulevard	Galveston	TX	77555	Galveston County	8062	622110
54	21	21	Washington County Hospital		NA	251 E. Antietam Street	Hagerstown	MD	21740	Washington County	8062	622110
55	38	38	Wilkes-Barre General Hospital		NA	575 N. River Street	Wilkes-Barre	PA	18764	Luzerne County	8062	622110
56	111	111	Wyoming Medical Center		NA	1233 E. Second Street	Casper	WY	82601	Natrona County	8062	622110
57	116	116	Yukon-Kuskokwim Delta Regional Hospital		Bethel Hospital	829 Chief Eddie Hoffman Highway, P.O. Box 528	Bethel	AK	99559	Bethel Census Area	8062	622110

Source:

Dun and Bradstreet (DNB), 2007. Dun & Bradstreet 2008 Million Dollar Directory. Bethlehem, Pa. : Dun & Bradstreet, Inc.

Table 21. HMIWI Sales and Employment

No.	FACID	UNITID	Facility name	Unit number	Site description	Size category	New/existing	Commercial	Dun & Bradstreet number	Parent company	Parent company employment (2007)	Parent company sales (\$M 2007)	Size standards
1	54	54	Bayfront Medical Center		General Medical and Surgical Hospital	L	E	No	073224370	Bayfront Health System	2,018	\$264	\$31.5
2	44	44	Bethesda Memorial Hospital		General Medical and Surgical Hospital	L	E	No	132104761	Bethesda Healthcare Corp.	1,602	\$249	\$31.5
3	60	60--1	BMWNC, Inc.	Unit 1	Hospital/Medical/Infectious Waste Incineration Facility	L	E	Yes	784968278	Healthcare Waste Solutions, Inc.	240	\$15	\$11.5
4	43	43	Boca Raton Community Hospital		General Medical and Surgical Hospital	L	E	No	948519582	BRCH Corp.	1,400	\$48	\$31.5
5	1	1	Bristol-Myers Squibb Co.		Pharmaceutical Manufacturing Facility	L	E	No	001288497	Bristol-Myers Squibb Co.	43,000	\$17,900	750 EMPLOYEES
6	129	129	Centers For Disease Control And Prevention, Building 18	Unit 3	Public Health Facility	S	N	No	111396383	Centers for Disease Control and Prevention	LARGE	LARGE	NONE
7	40	40	Charleston Area Medical Center, General Hospital		General Medical and Surgical Hospital	L	E	No	119120129	Camcare Inc.	4,300	\$707	\$31.5
8	15	15--1	Curtis Bay Energy	Unit 1	Hospital/Medical/Infectious Waste Incineration Facility	L	E	Yes	969522143	Curtis Bay Energy	47	\$12	\$11.5
9	15	15--2	Curtis Bay Energy	Unit 2	Hospital/Medical/Infectious Waste Incineration Facility	L	E	Yes	969522144	Curtis Bay Energy	47	\$12	\$11.5
10	130	130	Department Of Veterans Affairs Medical Center		General Medical and Surgical Hospital	L	E	No		U.S. Department Of Veterans Affairs (US DVA)	LARGE	LARGE	\$31.5
11	125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		University	L	N	No		East Carolina University	5,078	\$317	\$6.5
12	86	86	Fairfield Medical Center		General Medical and Surgical Hospital	S	E	No	079428397	Fairfield Medical Center	2,200	\$172	\$31.5
13	20	20--1	Fort Detrick	Unit 5	National Security Facility	L	E	No	063198626	U.S. Army	LARGE	LARGE	NONE
14	20	20--2	Fort Detrick	Unit 6	National Security Facility	L	E	No	063198626	U.S. Army	LARGE	LARGE	NONE
15	18	18	Franklin Square Hospital Center		General Medical and Surgical Hospital	M	E	No	361516370	MedStar Health	23,000	\$2,900	\$31.5
16	82	82	Good Samaritan Hospital		General Medical and Surgical Hospital	M	E	No	071320501	Knox County Hospital Association	1,600	\$127	\$31.5
17	29	29	Hamot Medical Center		General Medical and Surgical Hospital	L	E	No	106307655	Hamot Health Foundation	2,032	\$353	\$31.5
18	109	109	Healthcare Environmental Services Inc.		Hospital/Medical/Infectious Waste Incineration Facility	L	E	Yes	147581615	MeritCare Health System	1,500	\$605	\$11.5
19	46	46	Holy Cross Hospital		General Medical and Surgical Hospital	L	E	No	040841632	Catholic Health East	50,000	\$4,100	\$31.5
20	25	25	Holy Spirit Hospital		General Medical and Surgical Hospital	M	E	No	071195630	Holy Spirit Health System	2,400	\$202	\$31.5
21	16	16	Johns Hopkins Medical Institute, Department Of Health Safety and Environment		University	M	E	No	003104478	Johns Hopkins Medicine	7,000	\$1,100	\$6.5
22	115	115	Kona Community Hospital		General Medical and Surgical Hospital	SR	E	No	096869669	Hawaii Health Systems Corp.	3,400	\$350	\$31.5
23	51	51	Lakeland Regional Medical Center		General Medical and Surgical Hospital	L	E	No	060253150	Lakeland Regional Medical Center	3,100	\$479	\$31.5
24	71	71	Loyola University Medical Center		General Medical and Surgical Hospital	L	E	No	796454689	Loyola University Health System	6,000	\$282	\$31.5
25	47	47	Malcolm Randall Veterans Affairs Medical Center		General Medical and Surgical Hospital	M	E	No		U.S. Department of Veterans Affairs (US DVA)	LARGE	LARGE	\$31.5
26	84	84	Mayo Clinic, Waste Management Facility		General Medical and Surgical Hospital	L	E	No	167141923	Mayo Foundation	34,921	\$7,400	\$31.5
27	87	87	Medcentral Health System, Mansfield Hospital		General Medical and Surgical Hospital	L	E	No	076904705	MedCentral Health System	2,700	\$265	\$31.5
28	88	88	Medina General Hospital		General Medical and Surgical Hospital	M	E	No	030208995	Medina Memorial Health Care System	1,100	\$76	\$31.5
29	48	48	Memorial Regional Hospital		General Medical and Surgical Hospital	L	E	No	021129080	MRI Center of Hollywood	2,000	\$93	\$31.5
31	5	5	Merck & Company, Inc.		Medicinal Chemical Manufacturing Facility	L	E	No	001317064	Merck & Co., Inc.	60,000	\$22,600	750 EMPLOYEES
30	36	36--1	Merck & Company, Inc.	Unit 2	Pharmaceutical Manufacturing Facility	L	E	No	001317065	Merck & Co., Inc.	60,000	\$22,600	750 EMPLOYEES
32	36	36--2	Merck & Company, Inc.	Unit 5	Pharmaceutical Manufacturing Facility	L	E	No	001317066	Merck & Co., Inc.	60,000	\$22,600	750 EMPLOYEES
34	120	120--1	Municipality Of Chambers County, Resource Recovery Center	Unit 1	Hospital/Medical/Infectious Waste Incineration Facility	L	N	Yes	059312749	Chambers County	28,772 (POPULATION)	\$25.5 (REVENUE)	50,000 (POPULATION)
35	120	120--2	Municipality Of Chambers County, Resource Recovery Center	Unit 2	Hospital/Medical/Infectious Waste Incineration Facility	L	N	Yes	059312749	Chambers County	28,772 (POPULATION)	\$25.5 (REVENUE)	50,000 (POPULATION)
36	77	77	Parkview Hospital		General Medical and Surgical Hospital	L	E	No	056830037	Parkview Health System	4,500	\$584	\$31.5
37	34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		University	M	E	No	003403953	Pennsylvania State University	29,080	\$3,266	\$6.5
38	30	30	Riddle Memorial Hospital		General Medical and Surgical Hospital	M	E	No	964014278	Jefferson Health System	20,700	\$3,200	\$31.5
39	108	108--1	Rocky Mountain Laboratories, National Institute Of Allergy And Infectious Diseases	Unit 1	Biomedical Research Facility	M	E	No	010366987	National Institutes of Health (NIH)	LARGE	LARGE	500 EMPLOYEES
40	81	81	South Bend Medical Foundation		General Medical and Surgical Hospital	M	E	No	064702889	South Bend Medical Foundation Inc.	800	\$38	\$31.5

Table 21. HMIWI Sales and Employment

No.	FACID	UNITID	Facility name	Unit number	Site description	Size category	New/existing	Commercial	Dun & Bradstreet number	Parent company	Parent company employment (2007)	Parent company sales (\$M 2007)	Size standards
41	55	55	St. Joseph's Hospital		General Medical and Surgical Hospital	L	E	No	107559163	Baptist Health Care Corp.	5,200	\$471	\$31.5
42	95	95	St. Joseph's Hospital		General Medical and Surgical Hospital	M	E	No	157316381	Ministry Health Care	12,000	\$94	\$31.5
43	63	63	St. Jude Children's Research Hospital		Children's Medical and Surgical Hospital	M	E	No	067717892	St. Jude Children's Research Hospital	2,500	\$418	\$31.5
44	42	42	Stericycle, Inc.		Hospital/Medical/Infectious Waste Incineration Facility	L	E	Yes	343596297	Stericycle, Inc.	5,254	\$789	\$11.5
45	106	106	Stericycle, Inc.		Hospital/Medical/Infectious Waste Incineration Facility	L	E	Yes	343596298	Stericycle, Inc.	5,254	\$789	\$11.5
46	94	94	Stericycle, Inc.		Hospital/Medical/Infectious Waste Incineration Facility	L	E	Yes	343596299	Stericycle, Inc.	5,254	\$789	\$11.5
47	110	110	Stericycle, Inc.		Hospital/Medical/Infectious Waste Incineration Facility	L	E	Yes	343596300	Stericycle, Inc.	5,254	\$789	\$11.5
49	65	65-1	Stericycle, Inc.	Unit 1	Hospital/Medical/Infectious Waste Incineration Facility	L	E	Yes	343596301	Stericycle, Inc.	5,254	\$789	\$11.5
48	65	65-2	Stericycle, Inc.	Unit 2	Hospital/Medical/Infectious Waste Incineration Facility	L	E	Yes	343596302	Stericycle, Inc.	5,254	\$789	\$11.5
49	59	59-1	Stericycle, Inc.	Unit 1	Hospital/Medical/Infectious Waste Incineration Facility	L	E	Yes	343596303	Stericycle, Inc.	5,254	\$789	\$11.5
50	59	59-2	Stericycle, Inc.	Unit 2	Hospital/Medical/Infectious Waste Incineration Facility	L	E	Yes	343596304	Stericycle, Inc.	5,254	\$789	\$11.5
51	41	41	Thomas Memorial Hospital		General Medical and Surgical Hospital	M	E	No	791536902	Thomas Health Systems Inc.	1,900	\$123	\$31.5
52	13	13	University Of Maryland At Baltimore, Environmental Health and Safety Facility		University	M	E	No	933418402	University of Maryland	26,316	\$2,032	\$6.5
53	98	98-1	University Of Texas Medical Branch		General Medical and Surgical Hospital	L	E	No	012669128	The University of Texas System	77,627	\$6,468	\$31.5
54	21	21	Washington County Hospital		General Medical and Surgical Hospital	M	E	No	780557138	Washington County Health System, Inc.	2,500	\$269	\$31.5
55	38	38	Wilkes-Barre General Hospital		General Medical and Surgical Hospital	M	N	No	804435063	Wyoming Valley Health Care System (WVHCS)	3,500	\$178	\$31.5
56	111	111	Wyoming Medical Center		General Medical and Surgical Hospital	M	E	No	073400582	Wyoming Medical Center Inc.	1,033	\$172	\$31.5
57	116	116	Yukon-Kuskokwim Delta Regional Hospital		General Medical and Surgical Hospital	SR	E	No	082508961	Yukon-Kuskokwim Health Corp.	1,800	\$84	\$31.5

Source:
Dun and Bradstreet (DNB), 2007. Dun & Bradstreet 2008 Million Dollar Directory.

Table 21. HMIWI Sales and Employment

No.	FACID	UNITID	Facility name	Unit number	Small entity (2007)
1	54	54	Bayfront Medical Center		No
2	44	44	Bethesda Memorial Hospital		No
3	60	60--1	BMWNC, Inc.	Unit 1	Borderline
4	43	43	Boca Raton Community Hospital		No
5	1	1	Bristol-Myers Squibb Co.		No
6	129	129	Centers For Disease Control And Prevention, Building 18	Unit 3	No
7	40	40	Charleston Area Medical Center, General Hospital		No
8	15	15--1	Curtis Bay Energy	Unit 1	Borderline
9	15	15--2	Curtis Bay Energy	Unit 2	Borderline
10	130	130	Department Of Veterans Affairs Medical Center		No
11	125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		No
12	86	86	Fairfield Medical Center		No
13	20	20--1	Fort Detrick	Unit 5	No
14	20	20--2	Fort Detrick	Unit 6	No
15	18	18	Franklin Square Hospital Center		No
16	82	82	Good Samaritan Hospital		No
17	29	29	Hamot Medical Center		No
18	109	109	Healthcare Environmental Services Inc.		No
19	46	46	Holy Cross Hospital		No
20	25	25	Holy Spirit Hospital		No
21	16	16	Johns Hopkins Medical Institute, Department Of Health Safety and Environment		No
22	115	115	Kona Community Hospital		No
23	51	51	Lakeland Regional Medical Center		No
24	71	71	Loyola University Medical Center		No
25	47	47	Malcolm Randall Veterans Affairs Medical Center		No
26	84	84	Mayo Clinic, Waste Management Facility		No
27	87	87	Medcentral Health System, Mansfield Hospital		No
28	88	88	Medina General Hospital		No
29	48	48	Memorial Regional Hospital		No
31	5	5	Merck & Company, Inc.		No
30	36	36--1	Merck & Company, Inc.	Unit 2	No
32	36	36--2	Merck & Company, Inc.	Unit 5	No
34	120	120--1	Municipality Of Chambers County, Resource Recovery Center	Unit 1	Yes
35	120	120--2	Municipality Of Chambers County, Resource Recovery Center	Unit 2	Yes
36	77	77	Parkview Hospital		No
37	34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		No
38	30	30	Riddle Memorial Hospital		No
39	108	108--1	Rocky Mountain Laboratories, National Institute Of Allergy And Infectious Diseases	Unit 1	No
40	81	81	South Bend Medical Foundation		Borderline

Table 21. HMIWI Sales and Employment

No.	FACID	UNITID	Facility name	Unit number	Small entity (2007)
41	55	55	St. Joseph's Hospital		No
42	95	95	St. Joseph's Hospital		No
43	63	63	St. Jude Children's Research Hospital		No
44	42	42	Stericycle, Inc.		No
45	106	106	Stericycle, Inc.		No
46	94	94	Stericycle, Inc.		No
47	110	110	Stericycle, Inc.		No
49	65	65--1	Stericycle, Inc.	Unit 1	No
48	65	65--2	Stericycle, Inc.	Unit 2	No
49	59	59--1	Stericycle, Inc.	Unit 1	No
50	59	59--2	Stericycle, Inc.	Unit 2	No
51	41	41	Thomas Memorial Hospital		No
52	13	13	University Of Maryland At Baltimore, Environmental Health and Safety Facility		No
53	98	98--1	University Of Texas Medical Branch		No
54	21	21	Washington County Hospital		No
55	38	38	Wilkes-Barre General Hospital		No
56	111	111	Wyoming Medical Center		No
57	116	116	Yukon-Kuskokwim Delta Regional Hospital		No

Source:

Dun and Bradstreet (DNB), 2007. Dun & Bradstreet 2008 Million Dollar Directory.