



Regulatory Impact Analysis for the Final Reclassification of Major Sources as Area Sources under Section 112 of the Clean Air Act

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Final Report

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TABLE OF CONTENTS

Section 1. Executive Summary	1
1.1 Summary	1
1.2 Summary of Approach for the Analysis	3
1.2.1 Baseline	5
1.2.2 Analytical Approach for Identifying Affected Sources and Calculating Cost Savings	5
1.2.3 Economic Impact Estimation Approach	12
1.2.4 Benefits/Disbenefits Analysis	13
1.3 Avoided Costs of the Final MM2A Rule	13
1.4 Results	16
1.4.1 Administrative Cost Savings	16
1.4.2 Economic Impact Findings for the Primary Scenario	16
1.4.3 Findings for Alternative Scenario 1	18
1.4.4 Findings for Alternative Scenario 2	19
1.5 Comparison of the Percentile Results for Each Scenario	20
1.5.1 Reclassification Considerations	22
1.6 Limitations and Uncertainties of the Analysis	22
1.7 Organization of this Report	24
Section 2. Baseline Description, Regulatory Scenarios, and Affected Entities	26
2.1 Basic Steps for the Analysis Under the Primary Scenario	26
2.2 Basic Steps Under Alternative Scenario 1	29
2.3 Basic Steps Under Alternative Scenario 2	30
Section 3. Regulatory Relief or Avoided Burden Costs	33
3.1 Year 1 Avoided Costs for Sources Affected by the Final MM2A Rule	34
3.2 Year 5 Avoided Cost for Sources Affected by the Final MM2A Rule	77
3.3 Present Value and Equivalent Annualized Value Costs	103
Section 4. Illustrative Emissions Impacts and Potential Control Cost Impacts	106
4.1 Estimating Number of Facilities per Source Category and the Fraction That Could Potentially Obtain Area Source Status	106
4.1.1 Findings	108

4.2	Determining Source Categories for the Emissions Assessment	109
4.3	Characterization of Affected Industries.....	110
4.4	Characterizing Potential Emission Impacts for Remaining Source Categories in the MM2A Database.....	114
4.5	Illustrative Source Category Cost Analyses for Alternative Scenario 2.....	137
4.6	Source Categories Included in Analysis	138
4.7	Illustrative Potential Cost Analysis Approach.....	140
4.8	Availability of HAP Control Technologies/Practices.....	143
4.9	Cost-Effectiveness Estimate Derivation for Source Categories	144
4.10	Results for Potential Cost Impact Analysis Considering the Illustrative Emissions Analysis	145
4.11	Limitations of This Analysis	147
Section 5. Benefits/Disbenefits		149
5.1	Introduction.....	149
5.2	PM _{2.5} Benefits/Disbenefits	149
5.2.1	PM _{2.5} Health Effects	150
5.2.2	Visibility Effects	151
5.3	Ozone Effects.....	151
5.3.1	Ozone Health Effects	152
5.3.2	Ozone Vegetation Effects	152
5.3.3	Ozone Climate Effects	153
5.4	NO ₂ Health Effects	153
5.5	SO ₂ Health Effects	154
5.6	NO ₂ and SO ₂ Health Co-Benefits/Co-Disbenefits.....	154
5.7	Hazardous Air Pollutant (HAP) Health Impacts	155
5.7.1	Benzene.....	156
5.7.2	Ethylbenzene.....	157
5.7.3	Toluene	157
5.7.4	Vinyl Chloride	158
5.7.5	Other Air Toxics	159
Section 6. Impacts of Regulatory Relief		161
6.1	Method for Analyzing Avoided Small Entity Impacts	161
6.1.1	Identifying Affected Sectors and Entities	163
6.1.2	Data Used to Characterize Affected Entities by Size	163

6.2	Developing Economic and Small Entity Regulatory Relief Impact Measures	200
6.3	Implementing the Sales Test to Measure Impacts on Industrial, Commercial and Other Sources under the Primary Scenario.....	201
6.4	Implementing the Sales Test to Measure Impacts on Industrial, Commercial and Other Sources under Alternative Scenario 1	229
6.5	Implementing the Sales Test to Measure Impacts on Industrial, Commercial and Other Sources under Alternative Scenario 2	254
6.6	Comparison of the Percentile Results for Each Scenario	279
Section 7. Limitations and Uncertainties		281
7.1	Avoided Cost Estimate Limitations and Uncertainties.....	282
7.1.1	Uncertainties in Estimates of Affected Sources.....	282
7.1.2	Uncertainties in Facility Estimates	282
7.1.3	Uncertainties in Permitting and Supporting Statement Costs.....	282
7.2	Economic Impact Data and Analysis Limitations and Uncertainties	283
7.3	Sales Test Data Limitations and Uncertainties	283
7.4	Benefits Limitations and Uncertainties	286
Section 8. References		288
Attachments		
A	Sectors and Source Categories Affected by the Final MM2A Rule	A-1
B	Summary of Methodology and Data Used to Review Reclassifications	B-1
C	Estimates Used for Calculating Potential Control Costs for the Illustrative 125 Percent Scenario Cost Analysis	C-1

LIST OF FIGURES

<u>Number</u>	<u>Page</u>
1-1. Cost-to-Sales Ratios Percentile Results for the PRIMARY SCENARIO, ALTERNATIVE SCENARIO 1, and ALTERNATIVE SCENARIO 2	20

LIST OF TABLES

Number	Page
1-1. Summary of Illustrative Cost Savings for the PRIMARY SCENARIO (2017\$).....	9
1-2. Summary of Illustrative Cost Savings for ALTERNATIVE SCENARIO 1 (2017\$)	11
1-3. Summary of Illustrative Cost Savings for ALTERNATIVE SCENARIO 2 (2017\$)	11
1-4. Summary of Costs or Cost Savings by Time Period	15
2-1. Facilities with Actual Emissions below 75 Percent of the MST under the PRIMARY SCENARIO	28
2-2. Facilities with Actual Emissions Below 50 Percent of the MST under ALTERNATIVE SCENARIO 1	30
2-3. Facilities with Actual Emissions Below 125 Percent of the MST under ALTERNATIVE SCENARIO 2.....	31
3-1. Year 1 Avoided Cost for Sources under the PRIMARY SCENARIO (2017\$)	36
3-2. Year 1 Avoided Cost for Sources under ALTERNATIVE SCENARIO 1 (2017\$)	49
3-3. Year 1 Avoided Cost for Sources under ALTERNATIVE SCENARIO 2 (2017\$)	63
3-4. Year 5 Avoided Cost for Sources under the PRIMARY SCENARIO (2017\$)	78
3-5. Year 5 Avoided Cost for Sources under ALTERNATIVE SCENARIO 1 (2017\$)	87
3-6. Year 5 Avoided Cost for Sources under ALTERNATIVE SCENARIO 2 (2017\$)	95
3-7. Estimated Present Value of the Net Cost Savings for Each ALTERNATIVE SCENARIO (billions of 2017\$)	103
3-8. Estimated Equivalent Annualized Value of the Net Cost Savings for Each ALTERNATIVE SCENARIO (millions of 2017\$).....	104
4-1. Source Categories Determined to have No Change in Emissions under the MM2A Final Rule.....	113
4-2. Number of Facilities in Source Categories Included in Emissions Analysis: Incremental Across Illustrative Scenarios	117
4-3. Estimation of Potential Emission Change for Petroleum Refinery Facilities in the PRIMARY SCENARIO	125
4-4. Source Categories Considered for Final Rule Illustrative Analysis of ALTERNATIVE SCENARIO 2.....	139
4-5. List of Source Categories with Sources Having Actual HAP Emissions Between the PRIMARY SCENARIO and ALTERNATIVE SCENARIO 2.....	140
4-6. HAP Cost-effectiveness Estimates for Source Categories with Available Control Technologies and Practices Included in Illustrative Analysis of ALTERNATIVE SCENARIO 2.....	143

4-7.	Potential Cost Impacts to HAP Source Categories with Sources Under ALTERNATIVE SCENARIO 2 and Having Available HAP Control Technologies or Techniques (2017\$).....	146
6-1.	Number of Establishments by Industry and Enterprise Size: 2012	166
6-2.	Number of Employees by Industry and Enterprise Size: 2012.....	177
6-3.	Receipts by Industry and Enterprise Size: 2012 (in millions of 2017\$).....	189
6-4.	Avoided Cost to Sales in Year 1 under the PRIMARY SCENARIO.....	206
6-5.	Avoided Cost to Sales in Year 5 under the PRIMARY SCENARIO.....	217
6-6.	Avoided Cost to Sales in Year 1 under ALTERNATIVE SCENARIO 1	230
6-7.	Avoided Cost to Sales in Year 5 under ALTERNATIVE SCENARIO 1	242
6-8.	Avoided Cost to Sales in Year 1 under ALTERNATIVE SCENARIO 2	255
6-9.	Avoided Cost to Sales in Year 5 under ALTERNATIVE SCENARIO 2	267
6-10.	Avoided Cost-to-Sales Ratios Percentile Results for the Three Scenarios.....	279
7-1.	Data Limitations for Specific NAICS Codes.....	284
A-1.	Sources That May Potentially Experience Regulatory Relief under the PRIMARY SCENARIO	A-1
A-2.	Sources That May Potentially Experience Regulatory Relief under ALTERNATIVE SCENARIO 1	A-10
A-3.	Sources That May Potentially Experience Regulatory Relief under ALTERNATIVE SCENARIO 2	A-19
C-1.	Nationwide Cost Impacts of Final OLD Amendments (2016\$)	C-1
C-2.	Total Capital Investment and Total Annual Costs (2016\$)	C-7

SECTION 1. EXECUTIVE SUMMARY

1.1 Summary

This Regulatory Impact Analysis (RIA) examines the benefits, costs, and economic impacts of the final rulemaking titled “Reclassification of Major Sources as Area Sources under Section 112 of Clean Air Act” (also known as Major MACT to Area (MM2A) rule). The MM2A rule implements the plain language reading of the Clean Air Act (CAA) section 112 definitions of “major” and “area” source and allows major sources to reclassify to area source status at such time the source takes enforceable limits on its potential to emit (PTE) hazardous air pollutants (HAP) below the MST.

Section 112 of the CAA distinguishes between major and area sources of HAP emissions. Major sources are larger sources of air emissions than area sources and, generally, different requirements apply to major sources and area sources.¹ Whether a source is a “major source” or an “area source” depends on the amount of HAP emitted by the source based on its actual or potential emissions. Section 112 of the CAA defined “major source” to mean a source that emits or has the potential to emit at or above either of the statutory thresholds of 10 tons per year (tpy) of any one HAP or 25 tpy of total HAP (henceforth referred to as MST) according to CAA section 112(a)(1). An “area source” is defined as any source that is not a major source according to CAA section 112(a)(2). If a source does not emit or does not have the potential to emit at or above either of the MST, then it is an “area source.”

Shortly after the EPA began implementing individual National Emission Standards for Hazardous Air Pollutants (NESHAP) resulting from the 1990 CAA Amendments, the Agency received multiple requests to clarify when a major source of HAP could avoid section 112 requirements applicable to major sources by taking enforceable limits on its PTE below the MST. In response, the EPA issued, on May 16, 1995, a memorandum from John Seitz, Director of the Office of Air Quality Planning and Standards, to the EPA regional air division directors (the 1995 Seitz Memorandum). In the 1995 Seitz Memorandum, the EPA stated its interpretation of the relevant statutory language that facilities that are major sources of HAP may switch to area source status at any time until the “first compliance date” of the standard. Under this

¹ For example, national emission standards for hazardous air pollutants (NESHAP) standards applicable to major sources of HAP are, with certain exceptions, emissions limits based on maximum available control technology (MACT) floor and/or beyond the floor analyses under CAA sections 112(d)(2) and (d)(3), while area sources may be subject to standards based on generally available control technology (GACT) standards rather than MACT standards, as provided in CAA section 112(d)(5).

interpretation, facilities that are major sources on the first substantive compliance date of an applicable major source NESHAP were required to comply permanently with that major source standard even if the source was subsequently to become an area source by limiting its PTE. This position was commonly referred to as the “Once In Always In” (OIAI) policy.

On January 25, 2018, the EPA issued a guidance memorandum from William L. Wehrum, Assistant Administrator of the Office of Air and Radiation, to the EPA regional air division directors titled “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act” (MM2A Memorandum).² In the MM2A Memorandum, the EPA discussed the plain language of CAA section 112(a) regarding Congress’s definitions of “major source” and “area source,” and determined that the OIAI policy articulated in the 1995 Seitz Memorandum is contrary to the plain language of the CAA and, therefore, must be withdrawn. The EPA is now proposing regulatory text to implement the plain language reading of the statute as discussed in the MM2A Memorandum. Under the plain language of the statute, a major source that takes enforceable limits on its PTE to bring its HAP emissions below the CAA section 112 MST becomes an area source under the plain language of the statute, no matter when the source may choose to take enforceable measures to limit its PTE HAP emissions. That source, now having area source status, will not be subject to the CAA section 112 requirements applicable to the source as a major source under CAA section 112 – so long as the source’s actual and PTE HAP remains below the CAA section 112 thresholds – and will instead be subject to any applicable area source requirements. The decision of a major source facility to take enforceable limits on its PTE HAP emissions and reclassify to area source status is purely voluntary.

This RIA estimates the potential net cost savings associated with the reclassification of major sources as area sources under section 112 of the CAA. The potential cost savings include illustrative estimates of administrative burden reduction for sources that reclassify to area source status and are no longer subject to major source NESHAP requirements. These cost savings are then estimated net of any additional illustrative costs to State and local agencies associated with the review of potential reclassifications. The economic impacts are separate estimates from the estimates of cost savings and measure avoided cost to sales for affected sources and industries. The avoided costs included in the measurement of avoided cost-to-sales ratios are estimates of administrative burden reduction or cost savings. The RIA does not estimate any costs or cost savings related to control equipment changes (*e.g.*, decrease in control device operating and maintenance costs due to reduced device use), though it does provide an illustrative analysis of

² See notice in 83 *FR* 5543, February 8, 2018.

the potential control costs for sources that may reduce HAP emissions in one instance (U.S. EPA, Sorrels, August 2020). Instead of a quantitative estimate of changes in benefits, the RIA provides a qualitative assessment of potential health and other benefits.

This RIA uses industry-level (six-digit North American Industry Classification System [NAICS] code) data and gauges the magnitude of the reduction in regulation for affected sources by comparing the avoided burden cost estimates to average industry revenues. The burden cost estimates are in annual terms (2016 and 2017 dollars), and the avoided annualized cost-to-sales ratios are calculated using average industry revenue and average industry revenue by entity (or by establishment) size. The U.S. Small Business Administration small business size standards current list (as of October 1, 2017) is used to define a small entity. We note that this analysis approach in general was used for the RIA for the Final Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, a regulatory relief rule promulgated in 2010.³

For the final MM2A rule, we have updated the assessment conducted at proposal for the six source categories and expanded our assessment to numerous additional source categories in response to public comments. We identify several source categories that are not likely to experience a change in emissions as a result of MM2A. We also conducted an in-depth analysis of potential changes in emissions upon reclassification for many source categories where we have information.

1.2 Summary of Approach for the Analysis

To assess the impacts associated with the MM2A final rulemaking, one would need to know which sources will reclassify from major source to area source status. Because the EPA does not know which sources will reclassify, for purposes of this rulemaking, we assessed potential impacts for three illustrative scenarios, each using a different analytical threshold. For this assessment, we estimated the number of facilities with actual HAP emissions at or below these analytical thresholds. Note that the EPA does not *project* that these facilities will reclassify, nor do we necessarily *expect* them to reclassify.⁴

The 2017 National Emissions Inventory (NEI) whole facility emissions along with source category modeling files were used to identify facilities with actual emissions for HAP (U.S.

³ The RIA is available at https://www3.epa.gov/ttn/ecas/docs/ria/permitting_ria_final-ghg-tailoring-rule_2010-05.pdf.

⁴ The EPA has information for 69 facilities that have reclassified from major to area source status since January 2018 in response to the MM2A policy. These facilities are described in the permit review technical support memorandum for the final MM2A rulemaking.

EPA, 2020b. The level of actual emissions at which facilities will consider participating in the MM2A reclassification process can be viewed as a continuous line from some level below the MST (incorporating a compliance margin below the MST) to a reasonable level above the MST (for sources that can reduce emissions and take a limit on their PTE to become area sources).

To illustrate the continuous line of actual emissions at which sources will consider participating in the MM2A reclassification process, for the MM2A illustrative analysis, the EPA focuses on three analytical scenarios. The 75 percent of the MST at 7.5 tons per year (tpy) for one HAP or 18.75 tpy for all HAP defines the primary illustrative analytical scenario in this analysis to calculate the cost savings and economic impact of the implementation of the MM2A final rule on industry sectors. In addition, to comply with the Office of Management and Budget's (OMB's) Circular A-4 guidance that analysis of a regulation includes at least three scenarios (a primary scenario and two alternatives: one more stringent and one less stringent),⁵ two alternative scenarios are examined. The two alternative illustrative scenarios examined in this report present: a 50 percent of the MST scenario (alternative scenario 1) and a 125 percent of the MST scenario (alternative scenario 2). The 50 percent of the MST is at 5 tpy of a single HAP or 12.5 tpy of all combined HAP. The 125 percent of the MST is at 12.5 tpy of a single HAP or 31.25 tpy of all combined HAP. Our analysis that includes these three alternative scenarios reflects an illustration of impacts for this final rule in which we present three representations of potential impacts, where impacts could occur for sources below the MST and for those above the MST. We are not able to determine exactly which major sources will reclassify nor precisely what impacts will occur for each source that does choose to reclassify, so the potential impacts are necessarily illustrative in nature. The analyses in this RIA for these three alternative scenarios reflect possible outcomes associated with this final rule.

Our analysis of the final MM2A rule includes several key elements:

- identification of HAP source categories potentially affected, and thus those that are not potentially affected, by the final rule;
- estimation of the number of facilities in each of these source categories;
- estimation of the number of facilities with actual HAP emissions below the thresholds for the primary illustrative scenario and the two alternative illustrative scenarios;

⁵ OMB's Circular A-4 is guidance that Federal agencies must follow to comply with Executive Order 12866, the basis for the content of regulatory impact analyses for rulemakings. This guidance is available at <https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/circulars/A4/a-4.pdf>, and p. 16 of Circular A-4 contains discussion on the development of regulatory alternatives.

- estimation of avoided ongoing labor burden;
- estimation of one-time permitting costs for the area source permits;
- estimation of area source burdens;
- estimation of cost savings;
- examination of potential control costs for some sources affected under the 125 percent scenario
- estimation of emissions impacts for some source categories;
- estimation of the economic impacts of this final rule; and
- benefits/disbenefits analysis.

A brief synopsis of these analytical aspects follows.

1.2.1 Baseline

The baseline for this final rulemaking is a state under which facilities that are major sources on the first substantive compliance date of an applicable major source NESHAP are required to comply permanently with that major source NESHAP. In terms of emissions, the no-action case baseline accounts for emissions changes from the maximum allowable emissions under the major source NESHAP that each major source is subject to. In contrast, the EPA in this final rule is indicating that a major source can reclassify to area source status at any time by limiting its PTE HAP to below the MST of 10 tpy of any single HAP or 25 tpy of any combination of HAP. The implementation of the plain language reading of the statute provides potential regulatory relief for sources that choose to limit their PTE HAP emissions and reclassify from major to area source status. As described, the no-action case is the baseline for this RIA. All of the alternative scenarios analyzed in this RIA estimate the level of potential regulatory relief in comparison to a baseline of major sources in that status according to their operating permits.

1.2.2 Analytical Approach for Identifying Affected Sources and Calculating Cost Savings

There are more than 7,000 sources in the major source NESHAP program covering a total of 114 industrial source categories. To facilitate the analyses conducted for the final rule, the EPA developed an MM2A database containing data from the 2017 National Emission Inventory (NEI), data collected to conduct residual risk and technology reviews (RTR) under sections 112(d)(6) and 112(f) of the CAA (henceforth referred to as RTR modeling file data), and data from the EPA's Enforcement and Compliance History On-line (ECHO) database. The

information contained in the MM2A database includes facility name and location, facility ID number, and HAP emissions data. The majority (and generally the most accurate) of the data were compiled from the NEI and RTR modeling file data for 74 source categories. The EPA used the RTR modeling file data and NEI data to estimate the number of facilities in each of these 74 source categories, and identify those that have actual emissions below the thresholds of the illustrative analytical scenarios. We used the ECHO data to estimate the number of facilities in the other 27 source categories. We then used the data for 74 RTR source categories to extrapolate the number of facilities that could be below the analytical thresholds under analysis in the other 27 source categories. This analysis, therefore, includes a total of 101 source categories out of 114 in the major source NESHAP program.

The EPA conducted an illustrative cost analysis to determine the potential impacts of the removal of the OIAI policy. The cost analysis is illustrative because the final rule does not mandate facilities to reclassify. A facility's decision to reclassify is voluntary and is based on several factors specific to the facility and factors specific to a given source category. Among the factors that may be a basis for a facility's decision to reclassify include the potential financial and other benefits and costs of changing operations that affect their emissions. Given standard economic behavior by facilities and the firms that own them, they will select the lowest-cost opportunities to sustain their emissions below the MST including a reasonable compliance margin for the facility. The choice to reclassify would be pursued only if the action is a financial return to the company that weighs the costs of preparing for the reclassification action and the benefits of not having to comply with one or more major source NESHAP. If it is not advantageous from a business perspective for the source to undergo reclassification, they will not seek a change in status in response to MM2A, thus not all facilities below the MST will reclassify.

To ensure facilities sustain emissions below the MST, facilities that reclassify are likely to create operating plans that include a compliance margin (i.e., operate at a reasonable level below the MST to guarantee they maintain area source status). In addition, many industries and areas of the country have other federal or state regulations the effect of which will continue to limit HAP emissions after a source reclassifies to area source status. Finally, there are economic limitations on production levels that can impact the level of potential emission changes. To the extent that a source's emissions correlate with the level of production and the level of competitiveness in the markets it is in, a source will face competition and limitations associated with industry growth (which is linked to how much the product is demanded by consumers) that will create rigidity in a source's efforts to increase production and hence emissions. All of these

factors will reduce opportunities to increase emissions to the maximum level permissible under area source status. As part of this analysis, the EPA examined 114 source categories subject to major source NESHAP under 40 CFR part 63. The EPA identified 13 source categories that would not be impacted by the change in policy because either the facilities would not be able to reach emissions below the MST or the NESHAP for the source category regulates area sources to the same level as major sources. So, the EPA's analysis therefore reduces to a total of 101 source categories. Of the 101 source categories included in the analysis, 74 were assessed using a direct approach based on emissions data in the RTR modeling files to estimate the number of facilities with emissions below the MST scenario, and 24 were assessed using an approach that relied on extrapolating from the source categories with RTR data to estimate the number of facilities with emissions below the MST scenario. For three source categories for industrial, commercial, and institutional (ICI) boilers and process heaters, the EPA also extrapolated from the RTR data, but used an approach that accounted for the fact that ICI boilers and process heaters are almost always located with sources subject to additional NESHAP. The EPA included the Reciprocating Internal Combustion Engines (RICE) source category in the extrapolated analysis, but did not include any costs or savings in the RIA because the compliance requirements for RICE at major and area sources are similar.

We received public comments on the analyses conducted at proposal requesting the EPA to expand the analyses to evaluate all major sources in the NESHAP program. For the final rule, we evaluate impacts on all source categories included in the major source NESHAP program and provide some insights to illustrate the potential response to the MM2A rule. As discussed in the MM2A database memo, of the 114 NESHAP source categories, the EPA determined early in the analysis of potential impacts that the MM2A rule would not affect facilities in 13 source categories. For 74 source categories, the EPA used RTR modeling file data to estimate the number of facilities in each source category and the HAP emissions from each facility. Among these 74 RTR source categories, the EPA determined that that the MM2A rule would not affect facilities in 16 source categories. For the remaining 27 source categories, the EPA generally estimated the number of facilities from the Environmental Compliance History Online (ECHO) data base, and extrapolated the number of facilities that would be affected from the source categories for which the EPA had RTR modeling data files. Among these 27 source categories, the EPA determined that that the MM2A rule would not affect facilities in nine source categories. In summary, we determined that facilities in 38 source categories would not be affected by the MM2A rulemaking.

For a detailed description of how the EPA identified and assessed affected sources categories, please see the two memoranda, *Documentation of the Data for Analytical Evaluations & Summary of Industries Potentially Impacted by the Final Rule “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act,”* and *Documentation of the compliance cost savings analysis for the final rulemaking “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”* (ERG, 2020a and 2020b).

For the source categories for which there are completed RTR modeling files, the EPA used the modeling files to approximate the total number of major source facilities in each source category. The EPA also used the RTR modeling files to estimate the number of facilities that could obtain area source status per source category under the three scenarios that are referred to in this RIA as the primary scenario, alternative scenario 1, and alternative scenario 2. For the 27 source categories for which EPA does not have RTR modeling files, the EPA used the ECHO database to estimate the number of major source facilities. To illustrate the potential for facilities with emissions below the MST for these 27 source categories, the EPA used 3-digit NAICS codes to match each extrapolated category to directly assessed source categories with RTR data. The two documentation memoranda (ERG, 2020a and 2020b) explain how the EPA calculated the number of major source facilities, the facilities with emissions below the MST and the estimated net cost savings per source category. The estimated net cost savings are based on deregulatory cost savings as measured by avoided supporting statement costs (avoided labor burden), costs associated with reclassification permit applications, and the costs of the area source rule requirements (area source burden). A summary description of the cost savings or avoided costs of the final MM2A rule is provided in Section 1.3.

Given that the actions of sources and businesses in response to this final rule are entirely voluntary, the analyses in this RIA, including the estimates of cost savings, are illustrative. The analytic timeline is assumed to begin with the year 2021, the year after the expected promulgation of this rule. In preparing the final analyses, the EPA concluded that not all of the reclassifications will likely occur in the first year after the rule is issued as assumed at proposal. This conclusion is consistent with findings from the review of the 69 actual reclassifications that have taken place that is included in the Permit Review and Reclassifications TSM and summarized in Attachment B of this RIA. To illustrate the potential cost impact of the policy, the EPA presents both the impacts if all reclassifications occur in a single year (i.e., the first year), and a 5-year outlook that assumes all sources included in the facility count will reclassify in that

timeframe and assumes ⁶the reclassifications are evenly distributed over the years within this outlook. Thus, in our final illustrative analysis, potential reclassifications will be complete by the end of 2024. This would be the case for all scenarios included in the analysis. We also presume that all sources in the MM2A database with emissions below the MST will voluntarily choose to reclassify and incur the estimated costs. Once reclassifications are complete, the sources receive a cost savings from reduced monitoring, recordkeeping, and reporting (MRR) of the major source NESHAP program in all subsequent years and incur costs to meet area source requirements in all subsequent years. These cost savings begin to accrue in the second year after reclassification. Thus, 2025 (the fifth year after all reclassifications are processed) displays the annual cost savings that continue in all future years given that there is no required review time for this change in policy. Table 1-1 summarizes the illustrative cost savings and number of facilities that may obtain area source status for the primary scenario analyzed. As shown in Table 1-1, the illustrative or potential annual cost savings for the primary scenario is negative \$4.0 million (2017 dollars) in year 1 (spread evenly over 4 years). For year 5 (2025) and years thereafter, the illustrative or potential cost savings is \$90.6 million annually (2017 dollars).

Table 1-1. Summary of Illustrative Cost Savings for the PRIMARY SCENARIO (2017\$)

Coverage of Source Categories	Total Number of Facilities in Source Category Subject to Major Source NESHAP	Facilities with Emissions Below 75% of the MST	Potential Net Annual Cost Savings (2017\$)
Source Categories with RTR data (74 Categories)	4,068	1,614 (39.7%)	(\$2.5) Million (year 1) \$56.1 Million (year 5)
All Other Source Categories (24 Categories)	1,294	266 (20.6%)	(\$0.4) Million (year 1) \$9.0 Million (year 5)
ICI Boilers and Process Heaters (3 categories)	1,821	687 (37.7%)	(\$1.1) Million (year 1) \$25.5 Million (year 5)
All Source Categories	7,183	2,567 (35.7%)	(\$4.0) Million (year 1) \$90.6 Million (year 5)

Sources: Eastern Research Group. August 2020a. ERG MM2A Database Memorandum, Analytical Evaluations & Summary of Industries Potentially Impacted by the Final Rule “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD; Eastern Research Group. August 2020b. ERG MM2A Cost Analysis Memorandum, Compliance cost savings analysis for the final rulemaking “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD. Net annual cost savings in parentheses denote negative estimates (i.e., positive costs).

⁶ We acknowledge that facilities that choose to reclassify have some finite period of time in which they will operate. Industrial plant lifetimes can be 25 years or longer, according the U.S. Energy Information Administration (EIA) (2015). Given the extent and variety of sectors, with several of them that are not industrial in nature, we chose not to analyze the impacts of the final rule over a definite period of time.

Tables 1-2 and 1-3 summarize the illustrative cost savings and number of facilities with actual emissions below the thresholds for alternative scenario 1 and alternative scenario 2. As shown in Tables 1-2 and 1-3, the illustrative or potential annual cost savings for these scenarios are negative \$3.3 million and negative \$4.9 million (2017 dollars), respectively, in year 1 (spread evenly over 4 years). For year 5 and years thereafter, the illustrative or potential cost savings are \$73.8 million and \$111.0 million annually, respectively (2017 dollars).

To comply with Executive Order (EO) 12866, we have also estimated the present value (PV) of the illustrative cost savings for each scenario. For this analysis, there is the presumption of an infinite time horizon to estimate the PV, given that there is no review period for this action stated in the CAA. The PV of the cost savings for the primary scenario is \$0.86 billion (in 2017 dollars) at a discount rate of 7 percent, which is discounted to 2020. At a discount rate of 3 percent, the PV is \$1.50 billion (in 2017 dollars), again discounted to 2020. In 2016 dollars, these present values are \$0.84 billion and \$1.47 billion, again discounted to 2020. In addition, the PV is \$0.63 billion at a 7 percent discount rate and \$1.12 billion at a 3% discount rate, in 2016 dollars and discounted to 2016. A measure of the annual cost savings consistent with the PV estimate is the equivalent annualized value (EAV), and this is \$68 million (2017 dollars) at a 7 percent rate for the primary scenario. At a 3 percent discount rate, the EAV is \$76 million (2017 dollars). In 2016 dollars, the EAV is \$67 million at a 7 percent discount rate and \$75 million at a 3 percent rate. Finally, the EAV is \$51 million at a 7 percent discount rate and \$57 million at a 3 percent rate in 2016 dollars, and discounted to 2016. We show the PVs and EAVs in 2016 dollars as well as 2017 dollars to comply not only with EO 12866 but also with EO 13771.⁷ All of the PVs and EAVs are estimated presuming an infinite time horizon (i.e., perpetuity).

We also estimate the potential control costs for some sources that may reduce HAP emissions under alternative scenario 2. Alternative scenario 2 differs from the primary scenario and alternative scenario 1 in that facilities with emissions above major source levels would have to reduce their actual HAP emissions in order to reclassify, either by adopting controls or process modifications that reduce emissions, or by reducing production or throughput to reduce emissions. The sources in this alternative illustrative scenario would consider the cost associated with reducing emissions below the MST against the avoided costs associated with no longer having to comply with the major source NESHAP compliance requirements when deciding

⁷ Executive Order 13771, “Reducing Regulation and Controlling Regulatory Costs,” Guidance from US OMB on complying with Executive Order 13771 can be found at <https://www.federalregister.gov/documents/2017/02/03/2017-02451/reducing-regulation-and-controlling-regulatory-costs> and <https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/memoranda/2017/M-17-21-OMB.pdf>

whether to pursue reclassification. We examine this cost consideration in our analysis of alternative scenario 2 as applied to several source categories. This analysis and its results are described in more detail in Section 4 of this RIA and in the memorandum for this analysis (U.S. EPA, Sorrels, August 2020).

Table 1-2. Summary of Illustrative Cost Savings for ALTERNATIVE SCENARIO 1 (2017\$)

Coverage of Source Categories	Total Number of Facilities in Source Category Subject to Major Source NESHAP	Facilities with Emissions Below 50% of the MST	Potential Net Annual Cost Savings (2017\$)
Source Categories with RTR data (74 Categories)	4,068	1,345 (33.1%)	(\$2.1) Million (year 1) \$46.2 Million (year 5)
All Other Source Categories (24 Categories)	1,294	219 (16.9%)	(\$0.3) Million (year 1) \$7.5 Million (year 5)
ICI Boilers and Process Heaters (3 categories)	1,821	545 (29.9%)	(\$0.9) Million (year 1) \$20.1 Million (year 5)
All Source Categories	7,183	2,109 (29.4%)	(\$3.3) Million (year 1) \$73.8 Million (year 5)

Source: Eastern Research Group. August 2020a. ERG MM2A Database Memorandum, Analytical Evaluations & Summary of Industries Potentially Impacted by the Final Rule “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD; Eastern Research Group. August 2020b. ERG MM2A Cost Analysis Memorandum, Compliance cost savings analysis for the final rulemaking “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD. Net annual cost savings in parentheses denote negative estimates (i.e., positive costs).

Table 1-3. Summary of Illustrative Cost Savings for ALTERNATIVE SCENARIO 2 (2017\$)

Coverage of Source Categories	Total Number of Facilities in Source Category Subject to Major Source NESHAP	Facilities with Emissions Below 125% of the MST	Potential Net Annual Cost Savings (2017\$)
Source Categories with RTR data (74 Categories)	4,068	1,965 (48.3%)	(\$3.1) Million (year 1) \$68.7 Million (year 5)
All Other Source Categories (24 Categories)	1,294	330 (25.5%)	(\$0.5) Million (year 1) \$11.5 Million (year 5)
ICI Boilers and Process Heaters (3 categories)	1,821	814 (44.7%)	(\$1.3) Million (year 1) \$30.7 Million (year 5)
All Source Categories	7,183	3,109 (43.3%)	(\$4.9) Million (year 1) \$111.0 Million (year 5)

Source: Eastern Research Group. August 2020a. ERG MM2A Database Memorandum, Analytical Evaluations & Summary of Industries Potentially Impacted by the Final Rule “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD; Eastern Research Group. August 2020b. ERG MM2A Cost Analysis Memorandum, Compliance cost savings analysis for the final rulemaking “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD. Net annual cost savings in parentheses denote negative estimates (i.e., positive costs).

1.2.3 Economic Impact Estimation Approach

To estimate the economic impacts of this final rule, the EPA implemented the sales test to measure impacts on industrial, commercial, and other sources. The sales test is an approach that computes the annualized compliance costs as a share of sales for each company and is often the methodology the EPA employs in economic impact analyses such as this one. Another methodology is a profits test, in which annualized compliance costs are calculated as a share of profits.⁸ The EPA employs the sales test methodology because revenues or sales data are commonly available data for entities affected by EPA regulations, and profits data normally made available are often not the true profits earned by firms because of accounting and tax considerations. Firms and entities often have ways legally available in the tax code to minimize their reported profits; thus, using reported profits may lead to a less than accurate estimate of the economic impact of a regulation to an affected firm or entity and their consumers. Although screening-level analyses are often employed to estimate impacts to small businesses or entities as part of an analysis in compliance with the Regulatory Flexibility Act as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA), a screening-level analysis can also be used in an economic impact analysis such as this one whose focus is on the regulated companies. Given a general lack of information on the identity of owners of companies potentially affected by the final rule, the EPA implemented the recommended sales test and computed cost-to-sales ratios for affected sectors at the establishment (or facility) level.⁹ Information on establishments, employees, and receipts (sales) was taken from the latest complete set of data from the U.S. Economic Census (for 2012, the most recently complete Economic Census).¹⁰ For NAICS 115114, Postharvest Crop Activities, and 611310, Colleges and Universities, the data are from the 2012 County Business Patterns. The cost-to-sales ratios

⁸ More information on sales and profit tests as used in analyses done by the EPA can be found at <http://www.epa.gov/sbrefa/documents/rfaguidance11-00-06.pdf>, pp. 32–33.

⁹ Typically, SBREFA impact assessments are conducted at the ultimate parent company level. The EPA assumed that the U.S. Census Bureau definition of enterprise is equivalent to ultimate parent company. Theoretically, the comparison of compliance costs to sales should be conducted at the enterprise level. Because the U.S. Census Bureau only provides data for typical establishments within various enterprise size categories, the EPA chose to compute the cost-to-sales ratio at the establishment (or facility level). The same ratio could be computed at the enterprise level by multiplying both the numerator and the denominator by the typical number of establishments per enterprise in the appropriate enterprise size categories. Using the 2012 Economic Census data on typical establishments means that the cost-to-sales ratios are identical, whether computed at the establishment level or at the enterprise level.

¹⁰ The 2012 Economic Census is the most recent version that is complete and publicly available. The 2017 Economic Census started being released in stages beginning in September 2019 and will continue to be released until December 2021. Because all of the data for the 2017 Economic Census are not yet released, the EPA chose to use the complete datasets from the 2012 Economic Census for the final RIA. See <https://www.census.gov/programs-surveys/economic-census/news-updates/releases.html> for more details.

examine the ratio of the average establishment's total yearly avoided costs to the average establishment receipts for enterprises within several employment categories.

1.2.4 Benefits/Disbenefits Analysis

The benefits/disbenefits analysis describes the human health impacts associated with the final rule. This final rule may potentially result in both emission reductions and increases from a broad array of existing sources. As described in Section 5, pollutant emissions that may be affected include HAP, volatile organic compounds (VOCs), which are precursors to both fine particulate matter (PM_{2.5}) and ozone formation; sulfur dioxide (SO₂), which is a precursor to PM_{2.5}; oxides of nitrogen (NO_x), a precursor to both PM_{2.5} and ground-level ozone; organic HAP such as benzene, ethylbenzene, toluene, and vinyl chloride; and methane, a greenhouse gas (GHG) and precursor to ozone formation. As described in the subsequent sections, these pollutants are associated with substantial health effects, climate effects, and other welfare effects. Although the illustrative emissions analysis suggests that there may be both emission increases and decreases among source categories, we are uncertain of the magnitude, direction, and geographic distribution of changes in the emissions across the broad array of sources resulting from this rulemaking. As such, we are unable to quantify the changes in some HAP and all other pollutant emissions across these sources and cannot either simulate the change in air quality or characterize the impact of these changes to human health. This is not to imply that changing emissions will not affect human health. Rather, our approach reflects the challenges associated with modeling the direct and indirect impacts of the reductions in emissions for these sectors with the data currently available. In place of quantitative estimates of the quantity and economic value of the pollutant changes, we instead characterize these impacts in qualitative terms. Section 5 provides a qualitative assessment of the health benefits associated with altering exposure to these pollutants, as well as visibility impairment and ecosystem benefits.

1.3 Avoided Costs of the Final MM2A Rule

The EPA identified the facilities that could potentially be affected by the final MM2A rule. These facilities are classified as major sources that might opt to seek reclassifications to area source status with the final MM2A rule. The MM2A cost analysis memo describes how the estimated cost savings per source category were calculated for the source categories for which the EPA has completed RTR modeling files. Once a facility achieves area source status, there will be deregulatory cost savings due to avoided monitoring, recordkeeping, and reporting costs. However, the facility will still incur compliance costs as an area source facility. There will be costs associated with a reclassification permit application incurred by the facility and by the state agency. These permitting costs are one-time in nature and are reflected in the year 1 cost savings

estimates. The MM2A cost analysis memo describes how the deregulatory cost savings, compliance costs, and permitting costs are calculated. The EPA used the costs associated with obtaining a Minor New Source Review (NSR) Permit to calculate the costs to a facility of obtaining a permit to limit the PTE below the MST. The EPA used the permitting costs associated with an Administrative Amendment under 40 CFR part 70 (Administrative Amendment) to calculate the costs to a facility of modifying its existing operating permit to remove the major source NESHAP requirements and include any relevant area source NESHAP requirements. The EPA used the same minor NSR and Administrative Amendment permitting processes to estimate the cost incurred by a state agency to review and process the permit modifications. The one-time facility permitting cost is \$4,089 per facility (2017 dollars), and the one-time permitting agency burden is \$2,198 per facility (2017 dollars).

The estimated illustrative net cost savings in the first year after major source facilities obtain area source status (or year 1) is the sum of the permitting costs to the facilities, and the permitting costs to the state agencies. At proposal, we expected that all potential reclassifications would take place in one year. Based on the number of potential reclassifications discussed in this final analysis, we can confidently conclude that not all of the reclassifications will occur in the first year after the rule is issued. There are a limited number of hours in a year by which these reclassifications can be processed and determinations can be issued as final actions. The timing of a reclassification is influenced by several considerations including: time for facilities to determine whether it is in their best interests to reclassify, time to prepare applications for reclassification, and time for permitting authorities to review applications and process reclassification requests. There is also time allotted for the EPA to review determinations by permitting authorities (i.e., for Title V operating permit renewals), and for public participation in the process. Given these considerations, it is reasonable to assume that not all the reclassifications will occur within one year after the MM2A rule is finalized and instead the reclassifications assessed in the cost analysis will occur over some extended period of time. To illustrate the cost impact of the policy, we present both the impacts if all reclassifications occur in a single year, and a 5-year outlook that assumes all sources will reclassify in that time frame and assumes the reclassifications are evenly distributed over the years.

Thus, in our final illustrative analysis, potential reclassifications will be complete by the end of 2024. This would be the case for all scenarios included in the analysis. We also presume that all sources in the MM2A database with emissions below the MST will voluntarily choose to reclassify and incur the estimated costs. We therefore illustrate the cost impact of the policy change by presenting both the impacts if all reclassifications occur in a single year and a 5-year

outlook that assumes all sources included in our facility counts will reclassify in that timeframe, and assumes the reclassifications are evenly distributed over the years.

Table 1-4 shows, relative to the baseline, the timing of potential costs and cost savings that lead to an overall net annual cost savings for this final rule. The estimate of cost savings for each year do not account for changes in the costs of control equipment that may be associated with reclassification from major to area source status, such as capital, energy, and operating and maintenance costs.

Table 1-4. Summary of Costs or Cost Savings by Time Period

Source Size	Year 1	Year 5 and Years Thereafter
Major Source		Deregulatory cost savings
Area Source	<ul style="list-style-type: none"> ▪ Ongoing reporting costs (existing area sources) ▪ Ongoing reporting costs (new area sources) ▪ One-time permitting costs (new area sources) 	<ul style="list-style-type: none"> ▪ Ongoing reporting costs (existing area sources) ▪ Ongoing reporting costs (new area sources)

For the 27 source categories for which the EPA does not have complete RTR modeling files, the EPA used an extrapolated approach. The EPA used 3-digit NAICS codes to match each of these categories (called extrapolated categories) to the directly assessed source categories with RTR modeling data. Then, for each source category for which EPA did not have RTR modeling data, we summed the estimated cost savings in year 1 for the source categories with RTR modeling data that were matched by NAICS code to the category being evaluated. This was then divided by the number of facilities in the matching NAICS code to obtain the average cost savings in year 1 per facility. The same was then done for the cost savings in year 2 per facility. These average cost savings per facility were then multiplied by the estimated number of facilities that would be eligible to obtain area source status in each of the categories for which EPA did not have RTR modeling data to calculate the cost savings for each source category.

The EPA calculated the sum of estimated net cost savings for years 1 (2021) and years up to year 5 (2025 and beyond) of the source categories that were matched to the extrapolated category. Next, the EPA determined the average cost savings for years 1 and 5, and the other years in the analysis, for the matched source categories and used these to determine the cost savings for the extrapolated category. The MM2A Cost Analysis Memorandum describes the

extrapolated approach to calculate cost savings in detail.¹¹ This MM2A Cost Memorandum also details the methodology for calculating the estimated cost savings for the separate categories of ICI Boilers and Process Heaters and RICE. The EPA developed a list of facilities for RICE by downloading the data for major source facilities subject to 40 CFR 63, subpart ZZZZ from ECHO. Because subpart ZZZZ regulates both major and area sources and the compliance requirements are similar for RICE at major and area sources, the EPA assumed no cost savings for RICE located at major source facilities that obtain area source status. Although it is possible that these facilities would experience some savings, the EPA does not currently have enough detailed data to quantify those savings. However, the EPA estimated costs for the first year to obtain area source permits as a facility permit cost and a regulatory agency permit cost. No costs or savings were estimated for subsequent years.

1.4 Results

1.4.1 Administrative Cost Savings

The illustrative net cost savings in Tables 1-1, 1-2, and 1-3 are the avoided administrative burden for years 1 and 5. The illustrative or potential net annual cost savings for the primary scenario is negative \$4.0 million (2017 dollars) in year 1. For year 5 and years thereafter, the illustrative or potential net cost savings are \$90.6 million annually (2017 dollars). For alternative scenario 1, the illustrative or potential annual net cost savings are negative \$3.3 million (2017 dollars) in year 1 and \$73.8 million (2017 dollars) in year 5. For alternative scenario 2, the illustrative or potential annual net cost savings are negative \$4.9 million (2017 dollars) in year 1 and \$111.0 million (2017 dollars) in year 5. Thus, there are negative net annual cost savings in year 1 (2021), or positive costs, under each alternative scenario, but positive annual net cost savings in all years thereafter, including years 2 through 4 as shown in the MM2A cost analysis memorandum.

1.4.2 Economic Impact Findings for the Primary Scenario

The year 1 (2021) potential avoided cost-to-sales ratios range from -0.19 percent to less than 0.01 percent, with a median (or 50th percentile) potential avoided cost-to-sales ratio of less than 0.01 percent across all employment size categories. The twenty-fifth (25th) percentile and seventy-fifth (75th) percentile avoided cost-to-sales ratio in year 1 are -0.01 percent and less than 0.01 percent respectively across all employment size categories. The year 5 (2025 and beyond)¹²

¹¹ The MM2A Cost Analysis Memorandum includes the net annual cost savings estimates for years 2, 3, and 4 for all source categories and alternative scenarios.

¹² The impacts of the final rule in 2025 and beyond are those annual impacts that reflect full implementation of this final rule according to this analysis.

avoided cost-to-sales ratios range from less than 0.01 percent to 5.68 percent, with a median potential avoided cost-to-sales ratio of 0.05 percent across all employment size categories. The twenty-fifth percentile and seventy-fifth percentile avoided cost-to-sales ratios in year 5 are 0.01 percent and 0.17 percent, respectively, across all employment size categories. Figure 1-1 below in Section 1.5 provides a chart of these values.

Because facilities according to our analysis do not face permitting costs in year 5 and all reclassifications have taken place, the cost savings are larger in year 5 than year 1, and the resulting avoided cost-to-sales ratios are larger. For example, NAICS 337110 (Wood Kitchen Cabinet and Countertop Manufacturing) has an overall year 1 avoided cost-to-sales ratio of -0.06 percent and an overall year 5 avoided cost-to-sales ratio of 0.52 percent. Some NAICS codes that have less than 0.01 percent ratios in year 1 have positive ratios in year 5, such as NAICS 327310 (Cement Manufacturing), which has an overall avoided cost-to-sales ratio of less than 0.01 percent in year 1 and 0.09 percent in year 5.

As discussed above, we conducted a small entity analysis for both year 1 and year 5 impact estimates. In year 1, some small size categories have very small negative avoided cost-to-sales ratios. The “fewer than or equal to 19 employees” category of NAICS 424710 (Petroleum Bulk Stations and Terminals) has a less than 0.01 percent avoided cost-to-sales ratio, and the “20 to 99 employees” category of NAICS 325120 (Industrial Gas Manufacturing) has a less than 0.01 percent avoided cost-to-sales ratio. However, there are other cases of more negative economic impacts in year 1 for small size categories, even though these impacts are small in absolute terms. In year 1, the “fewer than or equal to 19 employees” category of NAICS 562211 (Hazardous Waste Treatment and Disposal), has a -0.06 percent avoided cost-to-sales ratio. Establishments in this size category are considered small businesses for NAICS 562211 because the average receipts per establishment in 2017 dollars is \$1.8 million which is less than the SBA size standard of \$38.5 million for this NAICS code. For the same size category, NAICS 493110 (General Warehousing and Storage) has an avoided cost-to-sales ratio of -0.11 percent in year 1. Establishments in the “fewer than or equal to 19 employees” size category for NAICS 493110 are treated as small businesses for purposes of this analysis because the average receipts per establishment in 2017 dollars is \$0.9 million which is less than the SBA size standard of \$27.5 million for this NAICS code.

In year 5, small entities generally have larger cost savings and the resulting avoided cost-to-sales ratios are larger. For example, for NAICS 213112 (Support Activities for Oil and Gas Operations) the “fewer than or equal to 19 employees” category in year 1 has an avoided cost-to-sales of -0.05 percent and in year 5, the ratio is 0.69 percent. Establishments in the “fewer than or

equal to 19 employees” size category for NAICS 213112 are treated as small businesses for purposes of this analysis because the average receipts per establishment is \$2.2 million in 2017 dollars which is less than the SBA size standard of \$38.5 million. For NAICS 562211, for the “fewer than or equal to 19 employees” category, the avoided cost-to-sales ratio in year 5 is 4.95 percent.

1.4.3 Findings for Alternative Scenario 1

For the first alternative scenario with a threshold of 50 percent, the year 1 avoided cost-to-sales ratios range from -0.19 percent to less than 0.01 percent, with a median avoided cost-to-sales ratio of less than 0.01 percent across all employment size categories. The twenty-fifth percentile and seventy-fifth percentile avoided cost-to-sales ratio in year 1 are -0.01 percent and less than 0.01 percent, respectively, across all employment size categories. The year 5 avoided cost-to-sales ratios range from less than 0.01 percent to 5.69 percent, with a median avoided cost-to-sales ratio of 0.05 percent across all employment size categories. The twenty-fifth percentile and seventy-fifth percentile avoided cost-to-sales ratio in year 5 are 0.03 percent and 0.23 percent, respectively, across all employment size categories.

Because facilities that may reclassify would not face permitting costs by year 5 and all reclassifications would be expected to have occurred by this time, the cost savings are larger and the resulting avoided cost-to-sales ratios are higher in year 5 than year 1. For example, NAICS 493110 (General Warehousing and Storage) has an overall year 1 avoided cost-to-sales ratio of -0.06 percent and an overall year 5 avoided cost-to-sales ratio of 1.34 percent. All NAICS codes have negative cost-to-sales ratios in year 1, and positive cost-to-sales ratios in year 5.

Like the primary scenario, we conducted a small entity analysis for both year 1 and year 5 impact estimates for the alternate scenario 1. In year 1, some small size categories have small negative avoided cost-to-sales ratios. NAICS 424710 (Petroleum Bulk Stations and Terminals) has an avoided cost-to-sales ratio of less than 0.01 percent for the “fewer than or equal to 19 employees” category and less than 0.01 percent for the “20 to 99 employees” category in year 1. There are no cases of positive economic impacts for year 1, but there are cases of larger positive economic impacts for small size categories in year 5. NAICS 332812 (Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers) has an avoided cost-to-sales ratio of -0.12 percent for the “fewer than or equal to 19 employees” category in year 1, and NAICS 493190 (Other Warehousing and Storage), has an avoided cost-to-sales ratio of 3.35 percent for the same size category in year 5. Establishments in the “fewer than or equal to 19 employees” size category for NAICS 493190 are considered small businesses for purposes of

this analysis because the average receipts per establishment is \$0.7 million, which is less than the SBA size standard of \$27.5 million for this NAICS code.

1.4.4 Findings for Alternative Scenario 2

For alternative scenario 2, which has a threshold of 125 percent MST, the year 1 avoided cost-to-sales ratios range from -0.19 percent to less than 0.01 percent, with a median avoided cost-to-sales ratio of less than 0.01 percent across all employment size categories. The twenty-fifth percentile and seventy-fifth percentile avoided cost-to-sales ratio in year 1 are -0.01 percent and less than 0.01 percent, respectively, across all employment size categories. The year 5 avoided cost-to-sales ratios range from less than 0.01 percent to 5.75 percent, with a median avoided cost-to-sales ratio of 0.06 percent across all employment size categories. The twenty-fifth percentile and seventy-fifth percentile avoided cost-to-sales ratio in year 5 are 0.02 percent and 0.18 percent, respectively, across all employment size categories.

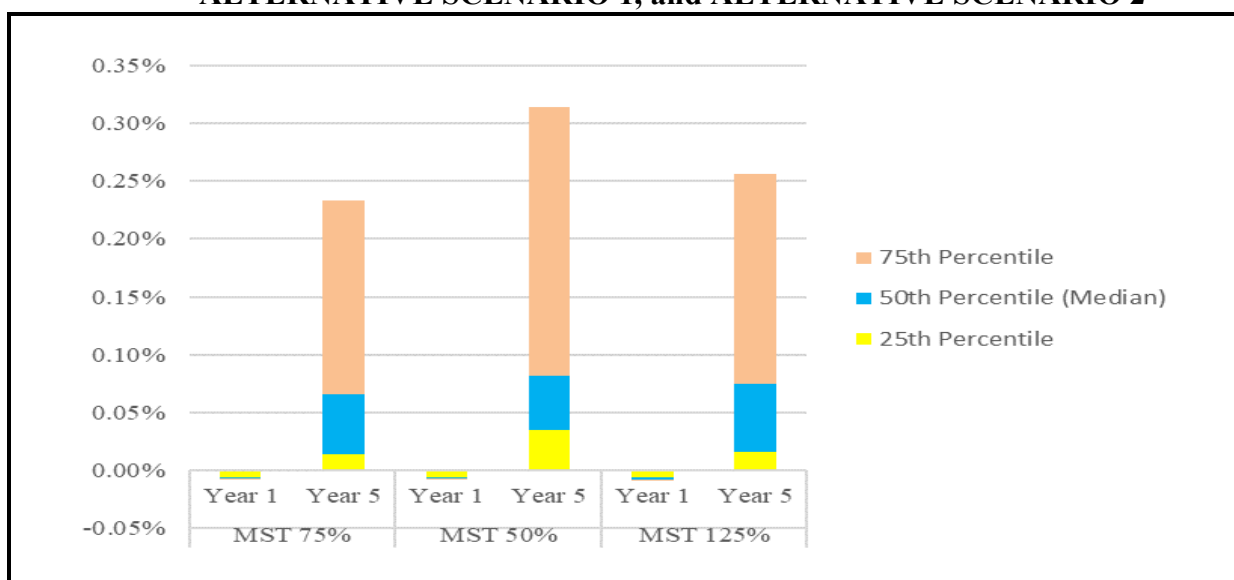
Because facilities that may reclassify would not face permitting costs by year 5 and all reclassifications would be expected to have occurred by this time, the cost savings are generally larger, and the resulting avoided cost-to-sales ratios are larger in year 5 than year 1. For example, NAICS 562211 (Hazardous Waste Treatment and Disposal) has an overall year 1 avoided cost-to-sales ratio of -0.01 percent and an overall year 5 avoided cost-to-sales ratio of 1.04 percent. Some other NAICS codes that have negative ratios in year 1 have positive ratios in year 5, such as NAICS 326191 (Plastics Plumbing Fixture Manufacturing), which has an overall avoided cost-to-sales ratio of -0.01 percent in year 1 and 0.29 percent in year 5.

Like for the primary scenario and alternative scenario 1, we conducted a small entity analysis for both year 1 and year 5 impact estimates for alternative scenario 2. In year 1, small size categories have negative avoided cost-to-sales ratios. For instance, NAICS 488210 (Support Activities for Rail Transportation) has an avoided cost-to-sales of -0.09 percent for the “fewer than or equal to 19 employees” category and -0.01 percent for the “20 to 99 employees” category in year 1. However, there are cases of larger positive economic impacts for small size categories in year 5. NAICS 332812 (Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers) has a year 5 “fewer than or equal to 19 employees” category avoided cost-to-sales ratio of 5.75 percent, and NAICS 493110 (General Warehousing and Storage) has a year 5 avoided cost-to-sales ratio of 2.75 percent for the same size category. As stated previously, for this analysis, establishments in this size category for NAICS 493110 are treated as small businesses based on the SBA size standard for this NAICS code.

1.5 Comparison of the Percentile Results for Each Scenario

Figure 1-1 displays the cost-to-sales ratios percentile results for the primary and two alternative scenarios. In year 1, the twenty-fifth percentiles, fiftieth percentiles (medians), and seventy-fifth percentiles across all employment size categories are very similar across the three scenarios. The twenty-fifth percentiles are -0.01 percent for each scenario, the medians are less than 0.01 percent for each scenario, and the seventy-fifth percentiles are less than 0.01 percent for each scenario. Hence, in year 1 these percentiles are approximately the same for each of the three scenarios.

Figure 1-1. Cost-to-Sales Ratios Percentile Results for the PRIMARY SCENARIO, ALTERNATIVE SCENARIO 1, and ALTERNATIVE SCENARIO 2



Note: The Year 1 percentile results are for 2021. The Year 5 percentile results are for Year 5 (2025) and years thereafter.

Sources: 2012 Economic Census, 2012 County Business Patterns, 2017 SBA Size Standards, SBA February 2016 Size Standards, SBA 2007 Size Standards, Federal Reserve Bank of St. Louis Economic Research, Eastern Research Group. August 2020a. MM2A Database Memorandum, Analytical Evaluations & Summary of Industries Potentially Impacted by the Final Rule “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD; Eastern Research Group. August 2020b. MM2A Cost Analysis Memorandum, Compliance cost savings analysis for the final rulemaking “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD.

In year 5 (2025 and beyond), the percentiles across all employment size categories are also quite similar across the three scenarios. The twenty-fifth percentiles are between 0.01 percent and 0.03 percent for the three scenarios, the medians are between 0.05 percent and 0.06 percent for each scenario, and the seventy-fifth percentiles are between 0.17 percent and 0.23 percent for the three scenarios (0.17 percent for the primary scenario, 0.23 percent for alternative

scenario 1 and 0.18 percent for alternative scenario 2). Hence, in year 5 the median is similar across the alternative scenarios, the twenty-fifth percentile results are also similar across scenarios, but the seventy-fifth percentiles are slightly different across scenarios. We note that these impacts for each scenario are less than half of those for the proposal, reflecting the lower estimate of net cost savings for the final rule as compared to those for the proposal. The estimated net annual cost savings for the final rule are less than half of those for the proposal. This change in net annual cost savings is the result of several factors: 1) the updated and enhanced final emissions database; 2) elimination of the double counting of sources when subject to multiple NESHAP; 3) updated 2017 emission information; and 4) updated cost parameters (the updated permitting costs and MRR costs). and our methodology that spreads out the cost impacts included in the final rule. At proposal, we assumed that all reclassifications would be expected to occur by the end of 2022. In the final rule all reclassifications that take place would be expected to occur by the end of 2024. Hence, the net cost savings will occur later according to the final rule analysis compared to that for the proposal.

The EPA recognizes there are efficiency considerations that may be inherent with the implementation of the final MM2A rule. This final rule implements the plain language reading of the CAA section 112 definitions of “major” and “area” source and provides major sources of HAP with the flexibility and opportunity to reclassify to area source status provided they reduce their emissions and HAP PTE below the major source thresholds. In contrast to OIAI, MM2A may provide potentially valuable incentives for research, development and diffusion of innovative, environmentally benign technologies that allow firms to substitute away from HAP-intensive production processes. While it is widely recognized that such incentives are important for sustainable economic growth, they are difficult to characterize empirically, or forecast. The flexibility provided by the rule allows major sources of HAP to no longer be subject to major source NESHAP requirements, which could result in a transfer of resources to production processes that could be used for technological innovation or investment to modernize regulated sources. If the final rule leads to greater incentives to invest and modernize regulated sources, this could lead to economic improvements across the country and thus increase overall efficiency from a social welfare standpoint.

We are unable to measure the economic value of the greater flexibilities provided by this rule and any potential change in innovation that could result. However, the reduction in costs of monitoring, recordkeeping and reporting associated with reclassification to area source status could lead to input substitution and other changes in the production process, particularly if the cost of compliance with a major source NESHAP is a nontrivial fraction of the overall cost of

production. To the extent that this rule encourages capital investments that improves the efficiency of the production process, less costly production of both end-use and intermediate outputs could lead to greater consumer demand, potentially improving social welfare, all else equal. The overall social costs and impacts of this rule, however, will depend on the relative magnitudes of these demand side effects and changes to the returns to factors of production. If an effect of this final rule is additional capital investment, then owners of capital will be better off as a result of the increase in return to capital. If the increased return to capital leads to a reduction in the return to labor, then less labor may be required in production, which would impact the overall social costs and impacts of this rule.

1.5.1 Reclassification Considerations

This RIA also recognizes and evaluates other behavioral responses to the action, including any potential change in emissions as a result of the rule. The EPA analyzed the 69 sources that have reclassified since January 2018 and also completed an illustrative analysis of potential reclassifications across numerous source categories, and concluded that most of these sources are not expected to increase emissions if they were to reclassify to area source status. In the illustrative analyses of impacts, the EPA does recognize, however, that some sources may increase or decrease their emissions if they were to reclassify and permitting authorities allow for changes in the enforceable conditions or practices used to comply with major source NESHAP requirements. We present these estimates of emissions increases or decreases in section 4 and Attachment B in this RIA. While some sources may increase their emissions after they reclassify, in most cases the potential change in emissions is modest and limited by many factors related to other regulatory limits, technology requirements, and economic reasons as discussed later in this RIA. Such potential emissions increases are consistent with the plain language and the statutory structure that Congress created in CAA section 112 as discussed in section IV of the preamble.

We recognize that any potential emissions increases related to this action may have the potential to lead to disbenefits to exposed populations, and vice versa for any potential emissions decreases. Benefits and disbenefits that may be associated with this action are discussed in section 5 of the RIA. Such benefits and disbenefits, if they were to occur, could affect overall efficiency from a social welfare standpoint.

1.6 Limitations and Uncertainties of the Analysis

This economic analysis has several sources of uncertainty. The most prominent uncertainty is that the EPA does not know which HAP major sources will take advantage of the opportunity to reclassify. The EPA recognizes that it is only able to quantify the approximate

number of facilities that are currently below the MST thresholds and be potentially eligible to reclassify. We are not able to precisely estimate the number of facilities that will actually choose to reclassify. It is possible that major sources may choose not to reclassify because the cost savings may not be a sufficient incentive to do so, or for other reasons.

Additional limitations and uncertainties include the following:

- The EPA reviewed some but not all operating permits for major sources in all source categories. This could lead to overestimation of the number of facilities in these source categories. This overestimate is in the range of 5 to 10 percent of the estimated number of facilities in each of these source categories.
- The accuracy of the emissions values used in this analysis will vary. The source of the data, the method to estimate the emissions, incomplete or missing data, the accuracy of assumptions, and other factors will influence emission estimates, which in turn will influence the number of facilities below the MST thresholds.
- The EPA considered emission estimates that are annual totals for certain years and that do not account for year-to-year variations. We found that the potential variation in our emissions estimates will be minimal in comparison to other uncertainties in these estimates that are discussed in the emissions memo. Therefore, the estimate of the number of facilities below the MST thresholds is based on a single year's emission estimate for each facility, whereas a facility's decision to reclassify could be based on expected emissions for several years in the future.
- In addition to the uncertainty in the emission and facility estimates, there is uncertainty in the burden costs used to estimate the regulatory relief from this rule. These uncertainties also affect the economic impact analysis conducted. The economic impact analysis compares the avoided burden cost estimates with average industry revenues to gauge the impact of the final MM2A rule for affected sources. The estimated compliance costs after facilities obtain area source status were based on the average estimated compliance costs for a relatively small number of area source rules. Each major source rule does not have a corresponding area source rule, so the average area source rule cost may not be representative of the actual compliance cost for all source categories.
- We were not able to estimate the reduction in costs to sources, and any reduction in revenues to states, from sources not having to incur Title V fees that are payable to states, due to reclassification.
- We used average industry revenue and average establishment revenue estimates by entity size to estimate avoided cost-to-sales ratios. The actual impacts to individual entities potentially affected by this policy change may differ from industry averages.
- The average entity costs used to compute the sales test vary across sources but are the same across establishment size categories. As a result, the sales test may overstate the

avoided cost-to-receipt ratio for establishments owned by small businesses, all other factors being equal.

- Using the 2012 Economic Census, we collected and organized data on number of establishments, employment, and receipts for affected sources represented by NAICS codes. However, because of confidentiality issues, some data values were not available or reported with a range of values. In addition, some NAICS codes were not valid 2012 NAICS codes, and either no data were reported for them in the 2012 Economic Census, or limited data were reported and not broken down by employment size categories. These data limitations are described in detail in Table 7-1 in Section 7 and prevent us from reporting avoided cost-to-sales ratios for every employment size category for some NAICS codes.
- The underlying establishment and receipts data are a limiting factor because if either of these measures is not reported for a certain category, we cannot calculate the average receipts per establishment, which is needed for the avoided cost-to-sales ratio calculation. However, for some cases avoided cost-to-sales ratios are not reported because we determined in our analysis that zero facilities would opt to reclassify; therefore, there are no facilities to calculate the average cost per entity.

This RIA estimates administrative burden reduction and some economic impact as measured by avoided cost-to-sales ratios. The overall analysis of costs and cost savings does not measure impacts related to control equipment changes (*e.g.*, decrease in control device operating and maintenance costs due to reduced device use) and does not provide quantitative estimates of changes in emissions and benefits.

1.7 Organization of this Report

The remainder of this report supports and details the methodology and the results of this illustrative RIA.

- Section 2 presents a discussion of the regulatory baseline, analysis scenarios, and affected entities.
- Section 3 describes the administrative cost savings of the final rule including those for the two alternative scenarios.
- Section 4 describes the impacts on emissions from the final rule and potential control cost impacts for sources affected in the analysis of alternative scenario 2.
- Section 5 describes the benefits/disbenefits of the final rule.
- Section 6 describes the economic impact methodology and the estimated economic impacts of the final rule.
- Section 7 describes limitations and uncertainties of the analyses in the RIA.
- Section 8 lists the references for the analyses included in this RIA.

SECTION 2.

BASELINE DESCRIPTION, REGULATORY SCENARIOS, AND AFFECTED ENTITIES

The OIAI policy did not allow a major source to become an area source if its PTE was over the major source threshold as of the source's first compliance date. With the final MM2A rule, sources that were once classified as major sources can reclassify to area source status at any time by taking limits on its PTE HAP below the MST. To determine which facilities could reclassify to area source status, the EPA used the 2017 NEI whole facility HAP emissions along with source category risk assessment modeling files to identify facilities with actual emissions below 75 percent of the MST. This primary scenario of 7.5 tpy for one HAP or 18.75 tpy for all HAPs is the primary scenario in this analysis to calculate the economic impacts of the final MM2A rule on various industry sectors. Two alternative scenarios, alternative scenario 1 and alternative scenario 2, are also included in this analysis. An explanation of the uncertainties associated with this methodology is discussed in Section 7 of this report. The basic steps used to estimate affected sources and permitting actions under the primary and alternative scenarios are described in Sections 2.1, 2.2, and 2.3.

2.1 Basic Steps for the Analysis Under the Primary Scenario

1) Identify source categories. The EPA selected 114 source categories subject to major source NESHAP requirements to be included in the MM2A cost analysis. At proposal, the EPA identified 13 categories with RTR data where the MM2A policy change is not expected to have an impact. The scope of EPA's analysis was thus reduced to a total of 101 source categories. Seventy-four categories in this group were assessed by the EPA using data from the RTR modeling files. In addition, 27 source categories were analyzed using an extrapolated approach (*i.e.*, using the cost information for the 74 source categories to estimate impacts for 24 of the 27 source categories). The RICE category was separately assessed but not included in the analysis. Three ICI Boilers and Process Heaters source categories were separately assessed. A detailed description of how the EPA identified and assessed affected source categories is provided in the MM2A Database Memorandum.

The selected sources evaluated in this analysis can be grouped in the following sectors:

- Energy (*e.g.*, Crude Petroleum & Natural Gas Extraction)
- Industrial (*e.g.*, Petrochemical Manufacturing and Automobile Manufacturing)
- Waste Treatment (*e.g.*, Hazardous Waste Treatment & Disposal)

- Commercial (e.g., General Warehousing & Storage)
- Agriculture (e.g., Postharvest Crop Activities [except Cotton Ginning])
- Utilities (e.g., Hydroelectric Power Generation)
- Educational Services (e.g., Colleges, Universities, and Professional Schools)

The 13 source categories with RTR data that would not be affected by the final MM2A rule are as follows:

1. Decorative Chromium Electroplating (NAICS 332813, Industrial Sector)
2. Hard Chromium Electroplating (NAICS 332813, Industrial Sector)
3. Integrated Iron & Steel (NAICS 331110, Heavy Industry)
4. Iron & Steel Foundries (NAICS 331511, Heavy Industry)
5. Municipal Solid Waste Landfills (NAICS 562212, Waste Treatment Sector)
6. Other Chromium Electroplating (NAICS 332813, Industrial Sector)
7. Portland Cement (NAICS 327310, Industrial Sector)
8. Secondary Aluminum (NAICS 331314, Heavy Industry)
- 9.. Secondary Lead (NAICS 331492, Industrial Sector)
- 10.. Stationary Combustion Turbines (NAICS 486210, Energy Sector)
11. Taconite Iron Ore Processing (NAICS 212210, Heavy Industry)
12. Vegetable Oil (NAICS 311224, Heavy Industry)¹³
13. Wool Fiberglass (NAICS 327993, Industrial Sector)

2) *Identify facilities for the primary scenario.* The EPA used source category RTR modeling files and 2017 NEI whole facility emissions to identify facilities with actual emissions below 75 percent of the MST that could potentially qualify as area source facilities for the primary scenario. Actual emissions for each source category were obtained from the 2017 NEI. Table 2-1 identifies facilities affected by the final MM2A rule under the primary scenario. The calculation of number of facilities in each sector and source category is based on the sources in our illustrative analysis that may experience regulatory relief listed by sector in Appendix A-1.

¹³ For the Vegetable Oil category, it was determined from our emissions analysis that there are two facilities that are eligible and thus could choose to reclassify, but are likely not to reclassify due to specific conditions at the facilities (expansion project, biorefinery). Therefore, their emissions are not likely to change as a result of the final rule.

Our illustrative analysis is cognizant that these major sources may voluntarily decide to reclassify, or not.

Table 2-1. Facilities with Actual Emissions below 75 Percent of the MST under the PRIMARY SCENARIO

Number of Facilities with Actual Emissions below 75% of the MST	
Agriculture	0
Commercial	64
Educational Services	9
Energy	163
Industrial	2,150
Utilities	151
Waste Treatment	30
Grand Total	2,567

Note: Some facilities in the Industrial category may actually be in the Public Administration (NAICS 922140, 927110, and 928110) and Unclassified (NAICS 999999) code categories.

Sources: 2012 Economic Census; Eastern Research Group. August 2020a. MM2A Database Memorandum, Analytical Evaluations & Summary of Industries Potentially Impacted by the Final Rule “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD; Eastern Research Group. August 2020b. MM2A Cost Analysis Memorandum, Compliance cost savings analysis for the final rulemaking “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD. August 2020.

The NEI contains the EPA’s most comprehensive estimates of annual HAP emissions. The EPA’s Air Toxics Program identifies 187 HAP (excepting the recently added 1-bromopropane). Some examples of these are benzene, formaldehyde, and acetaldehyde. The NEI’s HAP emission estimates allow the EPA to determine if there is any progress being made in the reduction of HAP as described in the Clean Air Act Amendments of 1990. The 2017 NEI obtains data from the state, local, and tribal (S/L/T) air agencies, as well as the development of NESHAP, and creates a national emissions database with this information.

The Air Emissions Reporting Rule (AERR) requires state agencies to report all sources of emissions, except fires and biogenic sources. States must report criteria air pollutant emissions, and there is a system in place for the voluntary submission of HAP emissions. The 2017 NEI uses the AERR-based inventory. The emission thresholds for reporting to the AERR are PTE thresholds versus actual emission thresholds. However, the reported emissions are actual emissions.

3) *Estimate Deregulatory Cost Savings.* The EPA calculated a per-facility labor burden using supporting statements issued with Information Collection Requests (ICRs) that accompany each regulatory action authorizing the government to collect data and information required by rules. Supporting statement costs are the monitoring, recordkeeping, and reporting costs that an

emitting unit incurs yearly as a result of being classified as a HAP major source and subject to a major source NESHAP. This per-facility labor burden multiplied by the number of facilities below 75 percent of the MST provides the estimated cost savings for these facilities becoming area sources for the primary scenario.

4) *Obtain average one-time permitting costs.* The EPA estimated the one-time permitting costs to facilities of \$4,089 per facility and the one-time state agency burden of \$2,198 per facility, based on inputs from the minor NSR and Administrative Amendment permitting processes. Both of these costs are in 2017 dollars. These one-time permitting costs to obtain area source permits were multiplied by the number of facilities below the primary scenario to estimate total permitting costs.

5) *Obtain area source burden estimates.* Where available, the EPA obtained area source burden estimates for facilities in each category subject to area source NESHAP. If the burden estimate data were not available, the EPA used the default weighted average of \$1,787 per year per facility. The ERG MM2A Cost Analysis Memorandum explains how this default value was estimated. These area source burden estimates per facility were multiplied by the number of facilities included in the primary scenario to obtain total area source burden.

2.2 Basic Steps Under Alternative Scenario 1

The EPA used source category RTR modeling files and 2017 NEI whole facility emissions to identify facilities with actual emissions below 50 percent of the MST that could potentially qualify as area source facilities for alternative scenario 1. The per facility labor burden multiplied by the number of facilities below 50 percent of the MST provided the estimated deregulatory cost savings for the facilities becoming area sources for the alternative scenario 1. The one-time permitting costs were multiplied by the number of facilities included in alternative scenario 1 to estimate total permitting costs. The per facility area source burden estimates were multiplied by the number of facilities in alternative scenario 1 to obtain total area source burden. Table 2-2 identifies facilities affected by the final MM2A rule under the alternative scenario 1. The calculation of the number of facilities in each sector is based on the sources in our illustrative analysis that may experience regulatory relief listed by sector and source category in Appendix A-2. The uncertainties discussed for the primary scenario also apply to this analytical scenario.

Table 2-2. Facilities with Actual Emissions Below 50 Percent of the MST under ALTERNATIVE SCENARIO 1

	Number of Facilities with Emissions Below 50% of the MST under ALTERNATIVE SCENARIO 1
Agriculture	0
Commercial	59
Educational Services	8
Energy	134
Industrial	1,754
Utilities	129
Waste Treatment	21
Grand Total	2,105

Note: Some facilities in the Industrial category may actually be in the Public Administration (NAICS 922140, 927110, and 928110) and Unclassified (NAICS 999999) code categories.

Sources: 2012 Economic Census; Eastern Research Group. August 2020a. ERG MM2A Database Memorandum, Analytical Evaluations & Summary of Industries Potentially Impacted by the Final Rule “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD; Eastern Research Group. August 2020b. ERG MM2A Cost Analysis Memorandum, Compliance cost savings analysis for the final rulemaking “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD.

2.3 Basic Steps Under Alternative Scenario 2

The EPA used source category RTR modeling files and 2017 NEI whole facility emissions to identify facilities with actual emissions below 125 percent of the MST and that could potentially qualify as area source facilities for alternative scenario 2. The per-facility labor burden multiplied by the number of facilities below 125 percent of the MST provided the cost savings for the facilities becoming area sources for the alternative scenario 2. The one-time permitting costs were multiplied by the number of facilities included in alternative scenario 2 to estimate total permitting costs. The area source burden estimates were multiplied by the number of facilities included in alternative scenario 2 to obtain total area source burden. Table 2-3 identifies facilities affected by the final MM2A rule under the alternative scenario 2. The calculation of the number of facilities in each sector is based on the sources in our illustrative analysis that may experience regulatory relief listed by sector and source category in Appendix A-3. The uncertainties discussed for the primary scenario also apply to this analytical scenario.

Table 2-3. Facilities with Actual Emissions Below 125 Percent of the MST under ALTERNATIVE SCENARIO 2

	Number of Facilities with Emissions Below 125% of the MST under ALTERNATIVE SCENARIO 2
Agriculture	0
Commercial	72
Educational Services	11
Energy	193
Industrial	2,648
Utilities	151
Waste Treatment	34
Grand Total	3,109

Note: Some facilities in the Industrial category may actually be in the Public Administration (NAICS 922140, 927110, and 928110) and Unclassified (NAICS 999999) code categories.

Sources: 2012 Economic Census; Eastern Research Group. August 2020a. ERG MM2A Database Memorandum, Analytical Evaluations & Summary of Industries Potentially Impacted by the Final Rule “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD; Eastern Research Group. August 2020b. ERG MM2A Cost Analysis Memorandum, Compliance cost savings analysis for the final rulemaking “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD.

SECTION 3.

REGULATORY RELIEF OR AVOIDED BURDEN COSTS

This chapter discusses the regulatory relief to sources that may potentially reclassify as a result of the removal of OIAI. This regulatory relief is estimated in the form of avoided costs or cost savings. Sections 3.1 and 3.2 explain the potential avoided costs to affected sources from this policy change.

If a source voluntarily chooses to reclassify to area source status, upon reclassification they will no longer be subject to applicable major source NESHAP and will no longer have the major source NESHAP compliance costs. The savings for a reclassified source from no longer having to comply with a major source NESHAP relates to monitoring, recordkeeping, and reporting requirements for such sources. However, a reclassified source may incur area source NESHAP compliance costs if the facility is subject to an applicable area source NESHAP. Costs associated with an area source rule may include different emissions control requirements, along with monitoring, recordkeeping, and reporting requirements. Facilities will also incur costs to obtain limits on the facility's potential to emit (PTE) and modify the facility's operating permit to remove major source NESHAP provisions and add newly applicable area source NESHAP provisions. To modify an operating permit under this action, owners or operators will be required to collect data and demonstrate that they qualify for consideration of status change from major or area source status. They will prepare an application and submit the request to the permitting authority and respond to any inquiries regarding the permit modification request. Overall, it is expected that the sum of costs and cost savings of actions taken to reclassify from major source to area source status in the long run will be a net annual cost savings.

It is difficult, if not impossible to predict whether any facility will choose to reclassify in response to MM2A rulemaking. The decision made by each facility will depend on facility-specific factors and factors that are also likely to be specific to a given source category.

For the cost savings analysis presented below, we estimate the costs associated with the number of facilities with actual HAP emissions below each analytical threshold as mentioned in the previous RIA chapter. These facility counts are likely to represent the maximum number of facilities that could seek to reclassify at each of these analytical thresholds, and not the actual number that would reclassify. Most facilities that reclassify would do so only if they were able to maintain a reasonable compliance margin between actual emissions and their limitations on the potential to emit HAP emissions below the MST still provide margin that would allow for a

reasonable amount of operating flexibility to allow for increased production or throughput when needed.

3.1 Year 1 Avoided Costs for Sources Affected by the Final MM2A Rule

Table 3-1 shows the costs avoided by affected sources in year 1 of the final MM2A rule under the primary scenario. It provides the number of facilities within a NAICS code that are subject to major source NESHAP requirements standards under section 112 of the CAA. These facilities are considered major sources. With the final MM2A rule, a facility that is a major source can reclassify to area source status by taking enforceable limits on its PTE HAP emissions. The table also shows the number of major source facilities with actual emissions under 75 percent of the MST. Once a facility achieves area source status, there will be avoided costs; however, within the first year, there will be one-time permitting costs to the facility and the permitting agency. Each major source facility that could potentially become an area source facility will have to apply for and obtain an area source permit, and the state agency will need to review and issue the permit. Hence, there will be permitting costs for both of these entities.

As mentioned previously in this RIA, the permitting cost to a facility is a one-time facility permitting burden estimate of \$4,089 (2017 dollars) per facility, and there is a one-time permitting authority agency burden of \$2,198 (2017 dollars) per facility. These one-time permitting costs are multiplied by the number of facilities under the analytical threshold to obtain total permitting costs to the state agency and to the facilities obtaining area source status.

For the categories with completed RTR modeling files, the annual estimated cost savings per source category are calculated based on the average supporting statement costs (*i.e.*, monitoring, recordkeeping and reporting costs) per facility from the ICR supporting statement associated with the major source NESHAP. These cost savings are multiplied by the number of facilities under the analytical threshold to obtain the projected cost savings per source category.

The annual estimated cost of area source requirements for a source category is calculated based on the estimated area source rule burden for that source category multiplied by the number of facilities under the analytical threshold.

The estimated net cost savings for year 1 for the categories with RTR modeling files are calculated by adding together the total permit modification costs to the state agency and the total permit modification costs to the facilities within each identified NAICS code. The EPA assumed that not all of the potential reclassifications from major source to area source will occur in the first year after the rule is issued and that all the potential reclassifications are evenly distributed

(that is, 25 percent of potential reclassifications are estimated to occur each year) over 4 years. So, the estimated net cost savings for year 1 shown in Table 3-1 are the year 1 (2021) portion (25 percent) of estimated net cost savings.

For the categories that were assessed using an extrapolated approach, the EPA used 3-digit NAICS codes to match the extrapolated category to the directly assessed source categories with RTR data. Then, the EPA calculated the sum of estimated cost savings in year 1 of the source categories that were matched to the extrapolated category. Next, the EPA determined the average cost savings for year 1 for the matched source categories and used these to determine the cost savings for the extrapolated category in year 1. The MM2A Cost Analysis Memorandum describes how these categories were assessed in year 1 in greater detail. RICE was not included in the cost analysis because the compliance requirements for RICE at major and area sources are similar.

The avoided costs in year 1, excluding the permitting cost to the state agency of reviewing and issuing area source permits, are also displayed in Table 3-1. For the categories with completed RTR modeling files, this calculation is the sum of the area source permitting cost to the facilities with actual emissions below the analytical thresholds. Again, based on the EPA assumptions about potential reclassifications, the avoided costs in year 1, excluding the permitting cost to the state agency shown in Table 3-1, are the year 1 (2021) portion (25 percent) of these costs. The average avoided cost per entity is the average net estimated cost savings in year 1, excluding the permitting costs to the state agency, for the facilities that could obtain area source status.

Table 3-2 shows the costs avoided by potentially affected sources in year 1 of the final MM2A rule under the alternative scenario 1. Table 3-3 shows the costs avoided by potentially affected sources in year 1 of the final MM2A rule under the alternative scenario 2. We note that the cost for facilities potentially affected under the alternative scenario 2 include those that have HAP emissions of between 75 percent to 125 percent, and this cost accounts for the 542 additional sources that potentially could reclassify under this scenario as compared to the primary scenario. Since these costs do not account for costs from control technology installation and operation that may be incurred by these sources as they reduce emissions part of a potential reclassification, the overall cost savings may be lower than shown here.

Table 3-1. Year 1 Avoided Cost for Sources under the PRIMARY SCENARIO (2017\$)

Sector	NAICS Descriptions	NAICS	Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
			Number of Facilities Subject to MACT	Number of Facilities Under the Primary Scenario	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (Year 1 Portion), \$	Avoided Costs Year 1 Portion (Excluding permitting cost to state agency)	Average Cost/Entity Avoided (2017)
Agriculture	Postharvest Crop Activities (except Cotton Ginning)	115114	1	0	-	-	-	-	-	-	-
Energy	Crude Petroleum and Natural Gas Extraction	211111	120	48	196,272	105,504	(67,128)	18,768	75,446	(49,067)	(1,022)
Energy	Natural Gas Liquid Extraction	211112	26	11	44,979	24,178	-	-	17,290	(11,244)	(1,022)
Industrial	Iron Ore Mining	212210	11	0	-	-	-	-	-	-	-
Industrial	Lead Ore and Zinc Ore Mining	212231	1	0	-	-	-	-	-	-	-
Industrial	Copper Ore and Nickel Ore Mining	212234	1	0	-	-	-	-	-	-	-
Industrial	All Other Metal Ore Mining	212299	1	0	-	-	-	-	-	-	-
Industrial	Industrial Sand Mining	212322	3	0	-	-	-	-	-	-	-
Industrial	Kaolin and Ball Clay Mining	212324	3	0	-	-	-	-	-	-	-
Industrial	Potash, Soda, and Borate Mineral Mining	212391	6	0	-	-	-	-	-	-	-
Industrial	All Other Nonmetallic Mineral Mining	212399	1	0	-	-	-	-	-	-	-
Energy	Support Activities for Oil and Gas Operations	213112	3	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Utilities	Hydroelectric Power Generation	221111	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Utilities	Fossil Fuel Electric Power Generation	221112	334	100	408,900	219,800	-	-	157,180	(102,222)	(1,022)
Utilities	Biomass Electric Power Generation	221117	5	4	16,356	8,792	-	-	6,287	(4,089)	(1,022)
Utilities	Other Electric Power Generation	221118	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Utilities	Other Electric Power Generation^	221119	8	6	24,534	13,188	-	-	9,431	(6,133)	(1,022)
Utilities	Electric Power Distribution	221122	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Utilities	Natural Gas Distribution	221210	13	9	36,801	19,782	-	-	14,146	(9,200)	(1,022)
Utilities	Water Supply and Irrigation Systems	221310	2	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Utilities	Sewage Treatment Facilities	221320	17	12	49,068	26,376	(46)	47	18,862	(12,267)	(1,022)
Utilities	Steam and Air-Conditioning Supply	221330	22	15	61,335	32,970	-	-	23,577	(15,333)	(1,022)
Industrial	Other Animal Food Manufacturing	311119	1	0	-	-	-	-	-	-	-
Industrial	Wet Corn Milling	311221	16	0	-	-	-	-	-	-	-
Industrial	Soybean Processing^	311222	16	0	-	-	-	-	-	-	-
Industrial	Other Oilseed Processing^	311223	5	0	-	-	-	-	-	-	-
Industrial	Soybean and Other Oilseed Processing	311224	116	2	8,178	4,396	(18,537)	894	3,144	(2,044)	(1,022)
Industrial	Fats and Oils Refining and Blending	311225	2	0	-	-	-	-	-	-	-
Industrial	Beet Sugar Manufacturing	311313	11	0	-	-	-	-	-	-	-
Industrial	Cane Sugar Manufacturing	311314	3	0	-	-	-	-	-	-	-
Industrial	Frozen Fruit, Juice, and Vegetable Manufacturing	311411	2	0	-	-	-	-	-	-	-

(continued)

Table 3-1. Year 1 Avoided Cost for Sources under the PRIMARY SCENARIO (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
			Number of Facilities Subject to MACT	Number of Facilities Under the Primary Scenario	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (Year 1 Portion), \$	Avoided Costs Year 1 Portion (Excluding permitting cost to state agency)	Average Avoided Cost/Entity (2017)
Industrial	Fruit and Vegetable Canning	311421	1	0	-	-	-	-	-	-	
Industrial	Specialty Canning	311422	2	0	-	-	-	-	-	-	
Industrial	Cheese Manufacturing	311513	2	0	-	-	-	-	-	-	
Industrial	Dry, Condensed, and Evaporated Dairy Product Manufacturing	311514	3	0	-	-	-	-	-	-	
Industrial	Rendering and Meat Byproduct Processing	311613	1	0	-	-	-	-	-	-	
Industrial	Commercial Bakeries	311812	2	0	-	-	-	-	-	-	
Industrial	Other Snack Food Manufacturing	311919	1	0	-	-	-	-	-	-	
Industrial	Coffee and Tea Manufacturing	311920	1	0	-	-	-	-	-	-	
Industrial	Flavoring Syrup and Concentrate Manufacturing	311930	1	0	-	-	-	-	-	-	
Industrial	Spice and Extract Manufacturing	311942	4	0	-	-	-	-	-	-	
Industrial	All Other Miscellaneous Food Manufacturing	311999	6	0	-	-	-	-	-	-	
Industrial	Breweries	312120	3	1	4,089	2,198	-	-	1,572	(1,022)	
Industrial	Distilleries	312140	1	0	-	-	-	-	-	-	(1,022)
Industrial	Tobacco Manufacturing	312230	1	0	-	-	-	-	-	-	
Industrial	Yarn Spinning Mills^	313111	1	1	4,089	2,198	-	-	1,572	(1,022)	
Industrial	Thread Mills^	313113	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Broadwoven Fabric Mills	313210	2	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Narrow Fabric Mills^	313221	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Textile and Fabric Finishing Mills	313310	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Broadwoven Fabric Finishing Mills^	313311	3	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Fabric Coating Mills	313320	50	28	114,492	61,544	(81,842)	4,484	44,010	(28,622)	(1,022)
Industrial	Tire Cord and Tire Fabric Mills^	314992	1	0	-	-	-	-	-	-	(1,022)
Industrial	Leather and Hide Tanning and Finishing	316110	6	4	16,356	8,792	(1,594)	374	6,287	(4,089)	
Industrial	Sawmills	321113	61	11	44,979	24,178	-	-	17,290	(11,244)	(1,022)
Industrial	Wood Preservation	321114	3	0	-	-	-	-	-	-	(1,022)
Industrial	Hardwood Veneer and Plywood Manufacturing	321211	3	0	-	-	-	-	-	-	
Industrial	Softwood Veneer and Plywood Manufacturing	321212	29	6	24,534	13,188	-	-	9,431	(6,133)	
Industrial	Engineered Wood Member (except Truss) Manufacturing	321213	6	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)

(continued)

Table 3-1. Year 1 Avoided Cost for Sources under the PRIMARY SCENARIO (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
			Number of Facilities Subject to MACT	Number of Facilities Under the Primary Scenario	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (Year 1 Portion), \$	Avoided Costs Year 1 Portion (Excluding permitting cost to state agency)	Average Avoided Cost/Entity (2017)
Industrial	Reconstituted Wood Product Manufacturing	321219	315	61	249,429	134,078	(302,819)	16,776	95,880	(62,356)	(1,022)
Industrial	Wood Window and Door Manufacturing	321911	4	0	-	-	-	-	-	-	-
Industrial	Cut Stock, Resawing Lumber, and Planing	321912	4	0	-	-	-	-	-	-	-
Industrial	All Other Miscellaneous Wood Product Manufacturing	321999	3	0	-	-	-	-	-	-	-
Industrial	Pulp Mills	322110	18	3	12,267	6,594	-	-	4,715	(3,067)	(1,022)
Industrial	Paper (except Newsprint) Mills	322121	282	11	44,979	24,178	-	-	17,290	(11,244)	(1,022)
Industrial	Newsprint Mills	322122	7	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Paperboard Mills	322130	36	7	28,623	15,386	-	-	11,003	(7,156)	(1,022)
Industrial	Corrugated and Solid Fiber Box Manufacturing	322211	174	55	224,895	120,890	(23,451)	10,276	86,449	(56,222)	(1,022)
Industrial	Paper Bag and Coated and Treated Paper Manufacturing	322220	17	3	12,267	6,594	-	-	4,715	(3,067)	(1,022)
Industrial	Coated and Laminated Paper Manufacturing^	322222	12	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Sanitary Paper Product Manufacturing	322291	2	0	-	-	-	-	-	-	-
Industrial	All Other Converted Paper Product Manufacturing	322299	1	0	-	-	-	-	-	-	-
Industrial	Commercial Lithographic Printing^	323110	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Commercial Printing (except Screen and Books)	323111	188	110	449,790	241,780	(476,884)	18,870	172,898	\$(112,445)	(1,022)
Industrial	Books Printing	323117	3	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Petroleum Refineries	324110	430	77	314,853	169,246	(767,790)	14,010	121,678	(79,683)	(1,035)
Industrial	Asphalt Shingle and Coating Materials Manufacturing	324122	3	0	-	-	-	-	-	-	-
Industrial	All Other Petroleum and Coal Products Manufacturing	324199	4	0	-	-	-	-	-	-	-
Industrial	Petrochemical Manufacturing	325110	597	218	891,402	479,164	(103,327)	45,682	342,497	(222,744)	(1,022)
Industrial	Industrial Gas Manufacturing	325120	4	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Synthetic Dye and Pigment Manufacturing	325130	1	0	-	-	-	-	-	-	-
Industrial	Inorganic Dye and Pigment Manufacturing^	325131	3	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)

(continued)

Table 3-1. Year 1 Avoided Cost for Sources under the PRIMARY SCENARIO (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
			Number of Facilities Subject to MACT	Number of Facilities Under the Primary Scenario	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (Year 1 Portion), \$	Avoided Costs Year 1 Portion (Excluding permitting cost to state agency)	Average Avoided Cost/Entity (2017)
Industrial	Synthetic Organic Dye and Pigment Manufacturing^	325132	2	0	-	-	-	-	-	-	-
Industrial	Other Basic Inorganic Chemical Manufacturing	325180	10	3	12,267	6,594	-	-	4,715	(3,067)	(1,022)
Industrial	Alkalies and Chlorine Manufacturing^	325181	4	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Carbon Black Manufacturing^	325182	21	7	28,623	15,386	-	-	11,060	(7,193)	(1,028)
Industrial	All Other Basic Inorganic Chemical Manufacturing^	325188	93	3	12,267	6,594	-	-	4,715	(3,067)	(1,022)
Industrial	Cyclic Crude and Intermediate Manufacturing^	325192	1	0	-	-	-	-	-	-	-
Industrial	Ethyl Alcohol Manufacturing	325193	7	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Cyclic Crude, Intermediate, and Gum and Wood Chemical Manufacturing	325194	2	0	-	-	-	-	-	-	-
Industrial	All Other Basic Organic Chemical Manufacturing	325199	77	23	94,047	50,554	(132,560)	2,186	36,151	(23,511)	(1,022)
Industrial	Plastics Material and Resin Manufacturing	325211	857	254	\$ 1,038,606	558,292		108,947	399,644	\$(259,910)	(1,023)
Industrial	Synthetic Rubber Manufacturing	325212	22	2	8,178	4,396	\$(1,911,759)	547	3,144	(2,044)	(1,022)
Industrial	Artificial and Synthetic Fibers and Filaments Manufacturing	325220	6	2	8,178	4,396	(225)	-	3,144	(2,044)	(1,022)
Industrial	Cellulosic Organic Fiber Manufacturing^	325221	1	0	-	-	-	-	-	-	-
Industrial	Noncellulosic Organic Fiber Manufacturing^	325222	4	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Nitrogenous Fertilizer Manufacturing	325311	16	6	24,534	13,188	-	-	9,431	(6,133)	(1,022)
Industrial	Phosphatic Fertilizer Manufacturing	325312	30	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Pesticide and Other Agricultural Chemical Manufacturing	325320	22	5	20,445	10,990	(73,333)	2,186	7,859	(5,111)	(1,022)
Industrial	Medicinal and Botanical Manufacturing	325411	4	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Pharmaceutical Preparation Manufacturing	325412	36	9	36,801	19,782	(4,133)	3,279	14,146	(9,200)	(1,022)
Industrial	Biological Product (except Diagnostic) Manufacturing	325414	1	0	-	-	-	-	-	-	-
Industrial	Paint and Coating Manufacturing	325510	48	19	77,691	41,762	(610,761)	9,291	29,864	(19,422)	(1,022)
Industrial	Adhesive Manufacturing	325520	4	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Surface Active Agent Manufacturing	325613	2	0	-	-	-	-	-	-	-

(continued)

Table 3-1. Year 1 Avoided Cost for Sources under the PRIMARY SCENARIO (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
			Number of Facilities Subject to MACT	Number of Facilities Under the Primary Scenario	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (Year 1 Portion), \$	Avoided Costs Year 1 Portion (Excluding permitting cost to state agency)	Average Avoided Cost/Entity (2017)
Industrial	Toilet Preparation Manufacturing	325620	2	0	-	-	-	-	-	-	-
Industrial	Explosives Manufacturing	325920	2	0	-	-	-	-	-	-	-
Industrial	Custom Compounding of Purchased Resins	325991	5	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Photographic Film, Paper, Plate, and Chemical Manufacturing	325992	4	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	All Other Miscellaneous Chemical Product and Preparation Manufacturing	325998	10	3	12,267	6,594	-	-	4,715	(3,067)	(1,022)
Industrial	Plastics Packaging Film and Sheet (including Laminated) Manufacturing	326112	5	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing	326113	16	7	28,623	15,386	-	-	11,003	(7,156)	(1,022)
Industrial	Unlaminated Plastics Profile Shape Manufacturing	326121	12	0	-	-	-	-	-	-	-
Industrial	Plastics Pipe and Pipe Fitting Manufacturing	326122	1	0	-	-	-	-	-	-	-
Industrial	Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing	326130	7	3	12,267	6,594	-	-	4,715	(3,067)	(1,022)
Industrial	Polystyrene Foam Product Manufacturing	326140	1	0	-	-	-	-	-	-	-
Industrial	Urethane and Other Foam Product (except Polystyrene) Manufacturing	326150	19	13	53,157	28,574	(21,096)	1,410	20,908	(13,598)	(1,046)
Industrial	Plastics Plumbing Fixture Manufacturing	326191	2	0	-	-	-	-	-	-	-
Industrial	All Other Plastics Product Manufacturing	326199	148	64	261,696	140,672	(570,759)	9,902	100,595	(65,422)	(1,022)
Industrial	Tire Manufacturing (except Retreading)	326211	39	19	77,691	41,762	-	-	29,344	(19,084)	(1,004)
Industrial	Rubber and Plastics Hoses and Belting Manufacturing	326220	6	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Rubber Product Manufacturing for Mechanical Use	326291	2	0	-	-	-	-	-	-	-
Industrial	All Other Rubber Product Manufacturing	326299	14	5	20,445	10,990	-	-	7,859	(5,111)	(1,022)
Industrial	Pottery, Ceramics, and Plumbing Fixture Manufacturing	327110	4	1	4,089	2,198	-	-	2,032	(1,321)	(1,321)

(continued)

Table 3-1. Year 1 Avoided Cost for Sources under the PRIMARY SCENARIO (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
			Number of Facilities Subject to MACT	Number of Facilities Under the Primary Scenario	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (Year 1 Portion), \$	Avoided Costs Year 1 Portion (Excluding permitting cost to state agency)	Average Avoided Cost/Entity (2017)
Industrial	Clay Building Material and Refractories Manufacturing	327120	76	47	192,183	103,306	(197,152)	21,002	73,874	(48,045)	(1,022)
Industrial	Clay Refractory Manufacturing^	327124	8	3	12,267	6,594	-	-	5,418	(3,524)	(1,175)
Industrial	Flat Glass Manufacturing	327211	2	0	-	-	-	-	-	-	-
Industrial	Other Pressed and Blown Glass and Glassware Manufacturing	327212	17	7	28,623	15,386	(13,643)	1,787	11,003	(7,156)	(1,022)
Industrial	Cement Manufacturing	327310	6	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Lime Manufacturing	327410	38	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Gypsum Product Manufacturing	327420	1	0	-	-	-	-	-	-	-
Industrial	Abrasive Product Manufacturing	327910	4	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Mineral Wool Manufacturing	327993	13	4	16,356	8,792	(18,426)	894	6,287	(4,089)	(1,022)
Industrial	All Other Miscellaneous Nonmetallic Mineral Product Manufacturing	327999	2	0	-	-	-	-	-	-	-
Industrial	Iron and Steel Mills and Ferroalloy Manufacturing	331110	73	39	159,471	85,722	(345,850)	16,534	61,300	(39,867)	(1,022)
Industrial	Iron and Steel Mills^	331111	50	3	12,267	6,594	-	-	4,715	(3,067)	(1,022)
Industrial	Electrometallurgical Ferroalloy Product Manufacturing^	331112	1	0	-	-	-	-	-	-	-
Industrial	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel	331210	5	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Rolled Steel Shape Manufacturing	331221	6	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Primary Aluminum Production^	331312	2	0	-	-	-	-	-	-	-
Industrial	Alumina Refining and Primary Aluminum Production	331313	16	2	8,178	4,396	(127,250)	447	3,144	(2,044)	(1,022)
Industrial	Secondary Smelting and Alloying of Aluminum	331314	56	7	28,623	15,386	(12,824)	8,344	11,003	(7,156)	(1,022)
Industrial	Aluminum Sheet, Plate, and Foil Manufacturing	331315	6	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Aluminum Extruded Product Manufacturing^	331316	1	0	-	-	-	-	-	-	-
Industrial	Other Aluminum Rolling, Drawing, and Extruding	331318	2	0	-	-	-	-	-	-	-
Industrial	Nonferrous Metal (except Aluminum) Smelting and Refining	331410	1	0	-	-	-	-	-	-	-
Industrial	Primary Smelting and Refining of Copper^	331411	0	0	-	-	-	-	-	-	-

(continued)

Table 3-1. Year 1 Avoided Cost for Sources under the PRIMARY SCENARIO (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
			Number of Facilities Category Subject to MACT	Number of Facilities Under the Primary Scenario	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (Year 1 Portion), \$	Avoided Costs Year 1 Portion (Excluding permitting cost to state agency)	Average Avoided Cost/Entity (2017)
Industrial	Primary Smelting and Refining of Nonferrous Metal (except Copper and Aluminum)^	331419	2	0	-	-	-	-	-	-	-
Industrial	Copper Rolling, Drawing, Extruding, and Alloying	331420	3	0	-	-	-	-	-	-	-
Industrial	Copper Wire (except Mechanical) Drawing^	331422	1	0	-	-	-	-	-	-	-
Industrial	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, and Extruding	331491	3	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	331492	2	0	-	-	-	-	-	-	-
Industrial	Iron Foundries	331511	59	4	16,356	8,792	-	-	6,287	(4,089)	(1,022)
Industrial	Steel Foundries (except Investment)	331513	2	0	-	-	-	-	-	-	-
Industrial	Aluminum Die-Casting Foundries^	331521	1	0	-	-	-	-	-	-	-
Industrial	Aluminum Foundries (except Die-Casting)	331524	2	0	-	-	-	-	-	-	-
Industrial	Nonferrous Forging	332112	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Metal Crown, Closure, and Other Metal Stamping (except Automotive)	332119	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Hand and Edge Tool Manufacturing^	332212	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Prefabricated Metal Building and Component Manufacturing	332311	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Fabricated Structural Metal Manufacturing	332312	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Metal Window and Door Manufacturing	332321	5	4	16,356	8,792	-	-	6,287	(4,089)	(1,022)
Industrial	Sheet Metal Work Manufacturing	332322	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Metal Can Manufacturing	332431	14	9	36,801	19,782	(30,882)	560	14,146	(9,200)	(1,022)
Industrial	Other Metal Container Manufacturing	332439	4	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Bolt, Nut, Screw, Rivet, and Washer Manufacturing	332722	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Metal Heat Treating	332811	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)

(continued)

Table 3-1. Year 1 Avoided Cost for Sources under the PRIMARY SCENARIO (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
			Number of Facilities Subject to MACT	Number of Facilities Under the Primary Scenario	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (Year 1 Portion), \$	Avoided Costs Year 1 Portion (Excluding permitting cost to state agency)	Average Avoided Cost/Entity (2017)
Industrial	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers	332812	433	280	\$ 1,144,920	615,440	\$(3,295,295)	50,070	440,103	\$(286,223)	(1,022)
Industrial	Electroplating, Plating, Polishing, Anodizing, and Coloring	332813	3	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Other Fabricated Metal Manufacturing	332990	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Small Arms Ammunition Manufacturing	332992	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Ammunition (except Small Arms) Manufacturing	332993	3	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	All Other Miscellaneous Fabricated Metal Product Manufacturing	332999	3	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Farm Machinery and Equipment Manufacturing	333111	8	3	12,267	6,594	-	-	4,715	(3,067)	(1,022)
Industrial	Lawn and Garden Tractor and Home Lawn and Garden Equipment Manufacturing	333112	1	0	-	-	-	-	-	-	-
Industrial	Construction Machinery Manufacturing	333120	64	28	114,492	61,544	(87,249)	11,618	44,010	(28,622)	(1,022)
Industrial	Mining Machinery and Equipment Manufacturing	333131	2	0	-	-	-	-	-	-	-
Industrial	Printing Machinery and Equipment Manufacturing^	333293	1	0	-	-	-	-	-	-	-
Industrial	Photographic and Photocopying Equipment Manufacturing	333316	1	0	-	-	-	-	-	-	-
Industrial	Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing	333415	1	0	-	-	-	-	-	-	-
Industrial	Machine Tool (Metal Cutting Types) Manufacturing^	333512	1	0	-	-	-	-	-	-	-
Industrial	Machine Tool (Metal Forming Types) Manufacturing^	333513	1	0	-	-	-	-	-	-	-
Industrial	Turbine and Turbine Generator Set Units Manufacturing	333611	1	0	-	-	-	-	-	-	-
Industrial	Other Engine Equipment Manufacturing	333618	5	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)

(continued)

Table 3-1. Year 1 Avoided Cost for Sources under the PRIMARY SCENARIO (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
			Number of Facilities Subject to MACT	Number of Facilities Under the Primary Scenario	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (Year 1 Portion), \$	Avoided Costs Year 1 Portion (Excluding permitting cost to state agency)	Average Avoided Cost/Entity (2017)
Industrial	Overhead Traveling Crane, Hoist, and Monorail System Manufacturing	333923	1	0	-	-	-	-	-	-	-
Industrial	Welding and Soldering Equipment Manufacturing	333992	2	0	-	-	-	-	-	-	-
Industrial	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	334220	1	0	-	-	-	-	-	-	-
Industrial	Electron Tube Manufacturing^	334411	1	0	-	-	-	-	-	-	-
Industrial	Bare Printed Circuit Board Manufacturing	334412	1	0	-	-	-	-	-	-	-
Industrial	Semiconductor and Related Device Manufacturing	334413	23	13	53,157	28,574	-	-	20,270	(13,182)	(1,014)
Industrial	Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use	334512	1	0	-	-	-	-	-	-	-
Industrial	Blank Magnetic and Optical Recording Media Manufacturing	334613	0	0	-	-	-	-	-	-	-
Industrial	Electric Lamp Bulb and Part Manufacturing	335110	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Household Laundry Equipment Manufacturing	335224	13	9	36,801	19,782	(72,435)	1,308	14,146	(9,200)	(1,022)
Industrial	Other Major Household Appliance Manufacturing	335228	2	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Power, Distribution, and Specialty Transformer Manufacturing	335311	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Motor and Generator Manufacturing	335312	2	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Storage Battery Manufacturing	335911	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Current-Carrying Wiring Device Manufacturing	335931	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Noncurrent-Carrying Wiring Device Manufacturing	335932	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Carbon and Graphite Product Manufacturing	335991	6	4	16,356	8,792	-	-	6,287	(4,089)	(1,022)
Industrial	Automobile Manufacturing	336111	66	18	73,602	39,564	(54,439)	934	28,292	(18,400)	(1,022)
Industrial	Light Truck and Utility Vehicle Manufacturing	336112	5	4	16,356	8,792	-	-	6,287	(4,089)	(1,022)

(continued)

Table 3-1. Year 1 Avoided Cost for Sources under the PRIMARY SCENARIO (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
			Number of Facilities Subject to MACT	Number of Facilities Under the Primary Scenario	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (Year 1 Portion), \$	Avoided Costs Year 1 Portion (Excluding permitting cost to state agency)	Average Avoided Cost/Entity (2017)
Industrial	Heavy Duty Truck Manufacturing	336120	8	5	20,445	10,990	-	-	7,859	(5,111)	(1,022)
Industrial	Motor Vehicle Body Manufacturing	336211	8	5	20,445	10,990	-	-	7,859	(5,111)	(1,022)
Industrial	Truck Trailer Manufacturing	336212	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Motor Vehicle Gasoline Engine and Engine Parts Manufacturing	336310	2	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Carburetor, Piston, Piston Ring, and Valve Manufacturing^	336311	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Gasoline Engine and Engine Parts Manufacturing^	336312	3	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing	336330	2	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Motor Vehicle Brake System Manufacturing	336340	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Motor Vehicle Transmission and Power Train Parts Manufacturing	336350	2	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Motor Vehicle Seating and Interior Trim Manufacturing	336360	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Motor Vehicle Metal Stamping	336370	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Other Motor Vehicle Parts Manufacturing	336390	13	7	28,623	15,386	-	-	11,003	(7,156)	(1,022)
Industrial	All Other Motor Vehicle Parts Manufacturing^	336399	2	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Aircraft Manufacturing	336411	125	102	417,078	224,196	(2,630,648)	17,188	160,323	(104,267)	(1,022)
Industrial	Aircraft Engine and Engine Parts Manufacturing	336412	8	5	20,445	10,990	-	-	7,859	(5,111)	(1,022)
Industrial	Other Aircraft Parts and Auxiliary Equipment Manufacturing	336413	10	6	24,534	13,188	-	-	9,431	(6,133)	(1,022)
Industrial	Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing	336415	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Railroad Rolling Stock Manufacturing	336510	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Ship Building and Repairing	336611	92	55	224,895	120,890	(671,875)	9,341	86,449	(56,222)	(1,022)
Industrial	Boat Building	336612	96	26	106,314	57,148	(98,842)	10,725	40,867	(26,578)	(1,022)
Industrial	Military Armored Vehicle, Tank, and Tank Component Manufacturing	336992	2	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)

(continued)

Table 3-1. Year 1 Avoided Cost for Sources under the PRIMARY SCENARIO (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
			Number of Facilities Subject to MACT	Number of Facilities Under the Primary Scenario	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (Year 1 Portion), \$	Avoided Costs Year 1 Portion (Excluding permitting cost to state agency)	Average Avoided Cost/Entity (2017)
Industrial	Wood Kitchen Cabinet and Countertop Manufacturing	337110	347	233	952,737	512,134	(507,664)	84,624	366,229	\$(238,178)	(1,022)
Industrial	Upholstered Household Furniture Manufacturing	337121	2	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Nonupholstered Wood Household Furniture Manufacturing	337122	14	9	36,801	19,782	-	-	14,146	(9,200)	(1,022)
Industrial	Institutional Furniture Manufacturing	337127	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Wood Office Furniture Manufacturing	337211	5	4	16,356	8,792	-	-	6,287	(4,089)	(1,022)
Industrial	Office Furniture (except Wood) Manufacturing	337214	19	12	49,068	26,376	(69,072)	1,868	18,862	(12,267)	(1,022)
Industrial	Showcase, Partition, Shelving, and Locker Manufacturing	337215	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Blind and Shade Manufacturing	337920	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Surgical and Medical Instrument Manufacturing	339112	2	0	-	-	-	-	-	-	-
Industrial	Surgical Appliance and Supplies Manufacturing	339113	1	0	-	-	-	-	-	-	-
Industrial	Jewelry and Silverware Manufacturing	339910	1	0	-	-	-	-	-	-	-
Industrial	Sporting and Athletic Goods Manufacturing	339920	1	0	-	-	-	-	-	-	-
Industrial	Office Supplies (except Paper) Manufacturing	339940	1	0	-	-	-	-	-	-	-
Industrial	Gasket, Packing, and Sealing Device Manufacturing	339991	2	0	-	-	-	-	-	-	-
Industrial	Burial Casket Manufacturing	339995	3	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	All Other Miscellaneous Manufacturing	339999	5	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Commercial	Grain and Field Bean Merchant Wholesalers	424510	1	0	-	-	-	-	-	-	-
Commercial	Petroleum Bulk Stations and Terminals	424710	7	3	12,267	6,594	-	-	4,715	(3,067)	(1,022)
Commercial	Scheduled Passenger Air Transportation	481111	2	0	-	-	-	-	-	-	-
Commercial	Line-Haul Railroads	482111	1	0	-	-	-	-	-	-	-
Energy	Pipeline Transportation of Crude Oil	486110	1	0	-	-	-	-	-	-	-
Energy	Pipeline Transportation of Natural Gas	486210	257	103	421,167	226,394	(45,900)	14,746	161,895	\$(105,289)	(1,022)
Energy	Pipeline Transportation of Refined Petroleum Products	486910	1	0	-	-	-	-	-	-	-

(continued)

Table 3-1. Year 1 Avoided Cost for Sources under the PRIMARY SCENARIO (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
			Number of Facilities Subject to MACT	Number of Facilities Under the Primary Scenario	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (Year 1 Portion), \$	Avoided Costs Year 1 Portion (Excluding permitting cost to state agency)	Average Avoided Cost/Entity (2017)
Commercial	Support Activities for Rail Transportation	488210	3	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Commercial	Marine Cargo Handling	488320	2	0	-	-	-	-	-	-	-
Commercial	General Warehousing and Storage	493110	180	57	233,073	125,286	(459,363)	105,839	89,592	(58,267)	(1,022)
Commercial	Other Warehousing and Storage	493190	6	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Commercial	Lessors of Nonresidential Buildings (except Miniwarehouses)	531120	1	0	-	-	-	-	-	-	-
Commercial	Testing Laboratories	541380	2	0	-	-	-	-	-	-	-
Commercial	Research and Development in the Physical, Engineering and Life Sciences (except Nanotechnology and Biotechnology)^	541715	2	0	-	-	-	-	-	-	-
Commercial	All Other Support Services	561990	1	0	-	-	-	-	-	-	-
Waste Treatment	Hazardous Waste Treatment and Disposal	562211	41	23	94,047	50,554	(503,197)	9,384	36,151	(23,511)	(1,022)
Waste Treatment	Solid Waste Landfill	562212	6	4	16,356	8,792	-	-	6,287	(4,089)	(1,022)
Waste Treatment	Solid Waste Combustors and Incinerators	562213	3	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Waste Treatment	Remediation Services	562910	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Educational Services	Colleges, Universities, and Professional Schools	611310	23	9	36,801	19,782	-	-	14,146	(9,200)	(1,022)
Commercial	Amusement and Theme Parks	713110	1	0	-	-	-	-	-	-	-
Commercial	Linen and Uniform Supply	812330	1	0	-	-	-	-	-	-	-
Commercial	Industrial Launderers	812332	3	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)

Notes:

One-time facility permitting burden is \$4,089 per facility (2017 dollars).

One-time state agency burden is \$2,196 per facility (2017 dollars).

Six source categories in the assessed source categories were identified that would not be affected by the change in policy: Decorative Chromium Electroplating, Hard Chromium Electroplating, Other Chromium Electroplating, Secondary Lead, Wool Fiberglass, and Portland Cement.

Out of these six categories, four area source categories are subject to a MACT standard where area sources in these categories are subject to the same HAP requirement for major sources in these categories: Decorative Chromium Electroplating, Hard Chromium Electroplating, Other Chromium Electroplating and Portland Cement. Because there are no differences in the requirements between major and area sources for these categories, there is no impact of the MM2A policy change on these categories and they were excluded from the table.

For Table 3-1, the two columns—Estimated Costs Savings and Estimated Cost of Area Source Requirements—are incomplete because for the cost categories without completed RTR modeling files, we only have the extrapolated cost or savings for facilities in year 1 and not a breakdown of those cost savings by area source requirement costs or supporting statement cost savings. We have included all of the cost information that is currently available.

The blank cells in the “Average Avoided Cost/Entity” column represent source categories for which there are zero facilities estimated to obtain area source status.

NAICS 922140 (Correctional Institutions), NAICS 927110 (Space Research and Technology), NAICS 928110 (National Security) are government/public administration NAICS codes not covered by the Census. Hence, we have not included them in this table.

NAICS 999999 is an unclassified code and therefore, we have not included it in this table.

Note: The total number of facilities estimated to obtain area source status in this table is less than the sum in Table 1-1 because our analysis excludes Public Administration (NAICS 922140, 927110, and 928110) and Unclassified NAICS Code (999999) because the Census does not report data for these NAICS codes.

Sources: 2012 Economic Census; Eastern Research Group. August 2020a. ERG MM2A Database Memorandum, Analytical Evaluations & Summary of Industries Potentially Impacted by the Final Rule “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD; Eastern Research Group. August 2020b. ERG MM2ACost Analysis Memorandum, Compliance cost savings analysis for the final rulemaking “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD.

NAICS 2012 and NAICS 2007 (<https://www.census.gov/eos/www/naics/downloadables/downloadables.html>)

Table 3-2. Year 1 Avoided Cost for Sources under ALTERNATIVE SCENARIO 1 (2017\$)

			Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
Sector	NAICS Descriptions	NAICS	Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 1	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (year 1)	Avoided Costs in Year 1 (excluding permitting cost to state agency)	Average Avoided Cost/ Entity (2017)
Agriculture	Postharvest Crop Activities (except Cotton Ginning)	115114	1	0	-	-	-	-	-	-	
Energy	Crude Petroleum and Natural Gas Extraction	211111	120	40	163,560	87,920	(55,940)	15,640	62,872	(40,889)	(1,022)
Energy	Natural Gas Liquid Extraction	211112	26	9	36,801	19,782	-	-	14,146	(9,200)	(1,022)
Industrial	Iron Ore Mining	212210	11	0	-	-	-	-	-	-	
Industrial	Lead Ore and Zinc Ore Mining	212231	1	0	-	-	-	-	-	-	
Industrial	Copper Ore and Nickel Ore Mining	212234	1	0	-	-	-	-	-	-	
Industrial	All Other Metal Ore Mining	212299	1	0	-	-	-	-	-	-	
Industrial	Industrial Sand Mining	212322	3	0	-	-	-	-	-	-	
Industrial	Kaolin and Ball Clay Mining	212324	3	0	-	-	-	-	-	-	
Industrial	Potash, Soda, and Borate Mineral Mining	212391	6	0	-	-	-	-	-	-	
Industrial	All Other Nonmetallic Mineral Mining	212399	1	0	-	-	-	-	-	-	
Energy	Support Activities for Oil and Gas Operations	213112	3	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Utilities	Hydroelectric Power Generation	221111	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Utilities	Fossil Fuel Electric Power Generation	221112	334	85	347,565	186,830	-	-	133,603	(86,889)	(1,022)
Utilities	Biomass Electric Power Generation	221117	5	4	16,356	8,792	-	-	6,287	(4,089)	(1,022)
Utilities	Other Electric Power Generation	221118	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Utilities	Other Electric Power Generation^	221119	8	5	20,445	10,990	-	-	7,859	(5,111)	(1,022)
Utilities	Electric Power Distribution	221122	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Utilities	Natural Gas Distribution	221210	13	7	28,623	15,386	-	-	11,003	(7,156)	(1,022)
Utilities	Water Supply and Irrigation Systems	221310	2	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Utilities	Sewage Treatment Facilities	221320	17	10	40,890	21,980	(40)	41	15,718	(10,222)	(1,022)
Utilities	Steam and Air-Conditioning Supply	221330	22	13	53,157	28,574	-	-	20,433	(13,289)	(1,022)
Industrial	Other Animal Food Manufacturing	311119	1	0	-	-	-	-	-	-	
Industrial	Wet Corn Milling	311221	16	0	-	-	-	-	-	-	
Industrial	Soybean Processing^	311222	16	0	-	-	-	-	-	-	

(continued)

Table 3-2. Year 1 Avoided Cost for Sources under ALTERNATIVE SCENARIO 1 (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
			Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 1	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (year 1)	Avoided Costs in Year 1 (excluding permitting cost to state agency)	Average Avoided Cost/ Entity (2017)
Industrial	Other Oilseed Processing^	311223	5	0	-	-	-	-	-	-	-
Industrial	Soybean and Other Oilseed Processing	311224	116	1	4,089	2,198	(9,269)	447	1,572	(1,022)	(1,022)
Industrial	Fats and Oils Refining and Blending	311225	2	0	-	-	-	-	-	-	-
Industrial	Beet Sugar Manufacturing	311313	11	0	-	-	-	-	-	-	-
Industrial	Cane Sugar Manufacturing	311314	3	0	-	-	-	-	-	-	-
Industrial	Frozen Fruit, Juice, and Vegetable Manufacturing	311411	2	0	-	-	-	-	-	-	-
Industrial	Fruit and Vegetable Canning	311421	1	0	-	-	-	-	-	-	-
Industrial	Specialty Canning	311422	2	0	-	-	-	-	-	-	-
Industrial	Cheese Manufacturing	311513	2	0	-	-	-	-	-	-	-
Industrial	Dry, Condensed, and Evaporated Dairy Product Manufacturing	311514	3	0	-	-	-	-	-	-	-
Industrial	Rendering and Meat Byproduct Processing	311613	1	0	-	-	-	-	-	-	-
Industrial	Commercial Bakeries	311812	2	0	-	-	-	-	-	-	-
Industrial	Other Snack Food Manufacturing	311919	1	0	-	-	-	-	-	-	-
Industrial	Coffee and Tea Manufacturing	311920	1	0	-	-	-	-	-	-	-
Industrial	Flavoring Syrup and Concentrate Manufacturing	311930	1	0	-	-	-	-	-	-	-
Industrial	Spice and Extract Manufacturing	311942	4	0	-	-	-	-	-	-	-
Industrial	All Other Miscellaneous Food Manufacturing	311999	6	0	-	-	-	-	-	-	-
Industrial	Breweries	312120	3	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Distilleries	312140	1	0	-	-	-	-	-	-	-
Industrial	Tobacco Manufacturing	312230	1	0	-	-	-	-	-	-	-
Industrial	Yarn Spinning Mills^	313111	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Thread Mills^	313113	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Broadwoven Fabric Mills	313210	2	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Narrow Fabric Mills^	313221	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Textile and Fabric Finishing Mills	313310	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Broadwoven Fabric Finishing Mills^	313311	3	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Fabric Coating Mills	313320	50	26	106,314	57,148	(75,022)	4,110	40,867	(26,578)	(1,022)

(continued)

Table 3-2. Year 1 Avoided Cost for Sources under ALTERNATIVE SCENARIO 1 (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
			Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 1	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (year 1)	Avoided Costs in Year 1 (excluding permitting cost to state agency)	Average Avoided Cost/ Entity (2017)
Industrial	Tire Cord and Tire Fabric Mills^	314992	1	0	-	-	-	-	-	-	-
Industrial	Leather and Hide Tanning and Finishing	316110	6	4	16,356	8,792	(1,594)	374	6,287	(4,089)	(1,022)
Industrial	Sawmills	321113	61	8	32,712	17,584	-	-	12,574	(8,178)	(1,022)
Industrial	Wood Preservation	321114	3	0	-	-	-	-	-	-	-
Industrial	Hardwood Veneer and Plywood Manufacturing	321211	3	0	-	-	-	-	-	-	-
Industrial	Softwood Veneer and Plywood Manufacturing	321212	29	3	12,267	6,594	-	-	4,715	(3,067)	(1,022)
Industrial	Engineered Wood Member (except Truss) Manufacturing	321213	6	0	-	-	-	-	-	-	-
Industrial	Reconstituted Wood Product Manufacturing	321219	315	44	179,916	96,712	(222,915)	10,667	69,159	(44,978)	(1,022)
Industrial	Wood Window and Door Manufacturing	321911	4	0	-	-	-	-	-	-	-
Industrial	Cut Stock, Resawing Lumber, and Planing	321912	4	0	-	-	-	-	-	-	-
Industrial	All Other Miscellaneous Wood Product Manufacturing	321999	3	0	-	-	-	-	-	-	-
Industrial	Pulp Mills	322110	18	3	12,267	6,594	-	-	4,715	(3,067)	(1,022)
Industrial	Paper (except Newsprint) Mills	322121	282	9	36,801	19,782	-	-	14,146	(9,200)	(1,022)
Industrial	Newsprint Mills	322122	7	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Paperboard Mills	322130	36	6	24,534	13,188	-	-	9,431	(6,133)	(1,022)
Industrial	Corrugated and Solid Fiber Box Manufacturing	322211	174	46	188,094	101,108	(19,613)	8,594	72,303	(47,022)	(1,022)
Industrial	Paper Bag and Coated and Treated Paper Manufacturing	322220	17	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Coated and Laminated Paper Manufacturing^	322222	12	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Sanitary Paper Product Manufacturing	322291	2	0	-	-	-	-	-	-	-
(Industrial	All Other Converted Paper Product Manufacturing	322299	1	0	-	-	-	-	-	-	-
Industrial	Commercial Lithographic Printing^	323110	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Commercial Printing (except Screen and Books)	323111	188	99	404,811	217,602	(429,668)	17,001	155,608	\$(101,200)	(1,022)
Industrial	Books Printing	323117	3	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)

(continued)

Table 3-2. Year 1 Avoided Cost for Sources under ALTERNATIVE SCENARIO 1 (2017\$) (continued)

			Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
Sector	NAICS Descriptions	NAICS	Number of Facilities y Subject to MACT	Number of Facilities Under Alternative Scenario 1	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (year 1)	Avoided Costs in Year 1 (excluding permitting cost to state agency)	Average Avoided Cost/ Entity (2017)
Industrial	Petroleum Refineries	324110	430	65	265,785	142,870	(644,421)	11,824	102,837	(67,430)	(1,037)
Industrial	Asphalt Shingle and Coating Materials Manufacturing	324122	3	0	-	-	-	-	-	-	-
Industrial	All Other Petroleum and Coal Products Manufacturing	324199	4	0	-	-	-	-	-	-	-
Industrial	Petrochemical Manufacturing	325110	597	190	776,910	417,620	(85,516)	42,355	298,123	\$(193,885)	(1,020)
Industrial	Industrial Gas Manufacturing	325120	4	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Synthetic Dye and Pigment Manufacturing	325130	1	0	-	-	-	-	-	-	-
Industrial	Inorganic Dye and Pigment Manufacturing^	325131	3	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Synthetic Organic Dye and Pigment Manufacturing^	325132	2	0	-	-	-	-	-	-	-
Industrial	Other Basic Inorganic Chemical Manufacturing	325180	10	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Alkalies and Chlorine Manufacturing^	325181	4	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Carbon Black Manufacturing^	325182	21	6	24,534	13,188	-	-	9,598	(6,242)	(1,040)
Industrial	All Other Basic Inorganic Chemical Manufacturing^	325188	93	3	12,267	6,594	-	-	4,715	(3,067)	(1,022)
Industrial	Cyclic Crude and Intermediate Manufacturing^	325192	1	0	-	-	-	-	-	-	-
Industrial	Ethyl Alcohol Manufacturing	325193	7	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Cyclic Crude, Intermediate, and Gum and Wood Chemical Manufacturing	325194	2	0	-	-	-	-	-	-	-
Industrial	All Other Basic Organic Chemical Manufacturing	325199	77	20	81,780	43,960	(132,560)	2,186	31,436	(20,444)	(1,022)
Industrial	Plastics Material and Resin Manufacturing	325211	857	197	805,533	433,006	\$(1,551,769)	84,119	309,686	\$(201,405)	(1,022)
Industrial	Synthetic Rubber Manufacturing	325212	22	2	8,178	4,396	(225)	547	3,144	(2,044)	(1,022)
Industrial	Artificial and Synthetic Fibers and Filaments Manufacturing	325220	6	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Cellulosic Organic Fiber Manufacturing^	325221	1	0	-	-	-	-	-	-	-
Industrial	Noncellulosic Organic Fiber Manufacturing^	325222	4	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)

(continued)

Table 3-2. Year 1 Avoided Cost for Sources under ALTERNATIVE SCENARIO 1 (2017\$) (continued)

			Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
Sector	NAICS Descriptions	NAICS	Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 1	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (year 1)	Avoided Costs in Year 1 (excluding permitting cost to state agency)	Average Avoided Cost/ Entity (2017)
Industrial	Nitrogenous Fertilizer Manufacturing	325311	16	4	16,356	8,792	-	-	6,287	(4,089)	(1,022)
Industrial	Phosphatic Fertilizer Manufacturing	325312	30	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Pesticide and Other Agricultural Chemical Manufacturing	325320	22	3	12,267	6,594	(36,667)	1,093	4,715	(3,067)	(1,022)
Industrial	Medicinal and Botanical Manufacturing	325411	4	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Pharmaceutical Preparation Manufacturing	325412	36	4	16,356	8,792	(1,378)	1,093	6,287	(4,089)	(1,022)
Industrial	Biological Product (except Diagnostic) Manufacturing	325414	1	0	-	-	-	-	-	-	-
Industrial	Paint and Coating Manufacturing	325510	48	18	73,602	39,564	(574,834)	8,745	28,292	(18,400)	(1,022)
Industrial	Adhesive Manufacturing	325520	4	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Surface Active Agent Manufacturing	325613	2	0	-	-	-	-	-	-	-
Industrial	Toilet Preparation Manufacturing	325620	2	0	-	-	-	-	-	-	-
Industrial	Explosives Manufacturing	325920	2	0	-	-	-	-	-	-	-
Industrial	Custom Compounding of Purchased Resins	325991	5	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Photographic Film, Paper, Plate, and Chemical Manufacturing	325992	4	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	All Other Miscellaneous Chemical Product and Preparation Manufacturing	325998	10	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Plastics Packaging Film and Sheet (including Laminated) Manufacturing	326112	5	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing	326113	16	6	24,534	13,188	-	-	9,431	(6,133)	(1,022)
Industrial	Unlaminated Plastics Profile Shape Manufacturing	326121	12	0	-	-	-	-	-	-	-
Industrial	Plastics Pipe and Pipe Fitting Manufacturing	326122	1	0	-	-	-	-	-	-	-

(continued)

Table 3-2. Year 1 Avoided Cost for Sources under ALTERNATIVE SCENARIO 1 (2017\$) (continued)

			Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
Sector	NAICS Descriptions	NAICS	Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 1	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (year 1)	Avoided Costs in Year 1 (excluding permitting cost to state agency)	Average Avoided Cost/ Entity (2017)
Industrial	Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing	326130	7	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Polystyrene Foam Product Manufacturing	326140	1	0	-	-	-	-	-	-	-
Industrial	Urethane and Other Foam Product (except Polystyrene) Manufacturing	326150	19	13	53,157	28,574	(21,096)	1,410	20,060	(13,046)	(1,004)
Industrial	Plastics Plumbing Fixture Manufacturing	326191	2	0	-	-	-	-	-	-	-
Industrial	All Other Plastics Product Manufacturing	326199	148	46	188,094	101,108	(409,224)	7,099	72,303	(47,022)	(1,022)
Industrial	Tire Manufacturing (except Retreading)	326211	39	14	57,246	30,772	-	-	22,638	(14,723)	(1,052)
Industrial	Rubber and Plastics Hoses and Belting Manufacturing	326220	6	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Rubber Product Manufacturing for Mechanical Use	326291	2	0	-	-	-	-	-	-	-
Industrial	All Other Rubber Product Manufacturing	326299	14	3	12,267	6,594	-	-	4,715	(3,067)	(1,022)
Industrial	Pottery, Ceramics, and Plumbing Fixture Manufacturing	327110	4	1	4,089	2,198	-	-	1,687	(1,097)	(1,097)
Industrial	Clay Building Material and Refractories Manufacturing	327120	76	41	167,649	90,118	(171,983)	18,321	64,444	(41,911)	(1,022)
Industrial	Clay Refractory Manufacturing^	327124	8	3	12,267	6,594	-	-	4,498	(2,925)	(975)
Industrial	Flat Glass Manufacturing	327211	2	0	-	-	-	-	-	-	-
Industrial	Other Pressed and Blown Glass and Glassware Manufacturing	327212	17	5	20,445	10,990	(6,821)	894	7,859	(5,111)	(1,022)
Industrial	Cement Manufacturing	327310	6	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Lime Manufacturing	327410	38	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Gypsum Product Manufacturing	327420	1	0	-	-	-	-	-	-	-
Industrial	Abrasive Product Manufacturing	327910	4	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Mineral Wool Manufacturing	327993	13	3	12,267	6,594	(9,213)	447	4,715	(3,067)	(1,022)
Industrial	All Other Miscellaneous Nonmetallic Mineral Product Manufacturing	327999	2	0	-	-	-	-	-	-	-
Industrial	Iron and Steel Mills and Ferroalloy Manufacturing	331110	73	37	151,293	81,326	(327,155)	15,640	58,157	(37,822)	(1,022)

(continued)

Table 3-2. Year 1 Avoided Cost for Sources under ALTERNATIVE SCENARIO 1 (2017\$) (continued)

			Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
Sector	NAICS Descriptions	NAICS	Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 1	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (year 1)	Avoided Costs in Year 1 (excluding permitting cost to state agency)	Average Avoided Cost/ Entity (2017)
Industrial	Iron and Steel Mills^	331111	50	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Electrometallurgical Ferroalloy Product Manufacturing^	331112	1	0	-	-	-	-	-	-	-
Industrial	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel	331210	5	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Rolled Steel Shape Manufacturing	331221	6	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Primary Aluminum Production^	331312	2	0	-	-	-	-	-	-	-
Industrial	Alumina Refining and Primary Aluminum Production	331313	16	0	-	-	-	-	-	-	-
Industrial	Secondary Smelting and Alloying of Aluminum	331314	56	5	20,445	10,990	(10,687)	6,953	7,859	(5,111)	(1,022)
Industrial	Aluminum Sheet, Plate, and Foil Manufacturing	331315	6	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Aluminum Extruded Product Manufacturing^	331316	1	0	-	-	-	-	-	-	-
Industrial	Other Aluminum Rolling, Drawing, and Extruding	331318	2	0	-	-	-	-	-	-	-
Industrial	Nonferrous Metal (except Aluminum) Smelting and Refining	331410	1	0	-	-	-	-	-	-	-
Industrial	Primary Smelting and Refining of Copper^	331411	0	0	-	-	-	-	-	-	-
Industrial	Primary Smelting and Refining of Nonferrous Metal (except Copper and Aluminum)^	331419	2	0	-	-	-	-	-	-	-
Industrial	Copper Rolling, Drawing, Extruding, and Alloying	331420	3	0	-	-	-	-	-	-	-
Industrial	Copper Wire (except Mechanical) Drawing^	331422	1	0	-	-	-	-	-	-	-
Industrial	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, and Extruding	331491	3	0	-	-	-	-	-	-	-
Industrial	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	331492	2	0	-	-	-	-	-	-	-

(continued)

Table 3-2. Year 1 Avoided Cost for Sources under ALTERNATIVE SCENARIO 1 (2017\$) (continued)

			Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
Sector	NAICS Descriptions	NAICS	Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 1	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (year 1)	Avoided Costs in Year 1 (excluding permitting cost to state agency)	Average Avoided Cost/ Entity (2017)
Industrial	Iron Foundries	331511	59	3	12,267	6,594	-	-	4,715	(3,067)	(1,022)
Industrial	Steel Foundries (except Investment)	331513	2	0	-	-	-	-	-	-	-
Industrial	Aluminum Die-Casting Foundries^	331521	1	0	-	-	-	-	-	-	-
Industrial	Aluminum Foundries (except Die-Casting)	331524	2	0	-	-	-	-	-	-	-
Industrial	Nonferrous Forging	332112	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Metal Crown, Closure, and Other Metal Stamping (except Automotive)	332119	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Hand and Edge Tool Manufacturing^	332212	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Prefabricated Metal Building and Component Manufacturing	332311	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Fabricated Structural Metal Manufacturing	332312	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Metal Window and Door Manufacturing	332321	5	4	16,356	8,792	-	-	6,287	(4,089)	(1,022)
Industrial	Sheet Metal Work Manufacturing	332322	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Metal Can Manufacturing	332431	14	8	32,712	17,584	(20,588)	374	12,574	(8,178)	(1,022)
Industrial	Other Metal Container Manufacturing	332439	4	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Bolt, Nut, Screw, Rivet, and Washer Manufacturing	332722	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Metal Heat Treating	332811	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers	332812	433	241	985,449	529,718	\$(2,837,352)	43,157	378,803	\$(246,356)	(1,022)
Industrial	Electroplating, Plating, Polishing, Anodizing, and Coloring	332813	3	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Other Fabricated Metal Manufacturing	332990	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Small Arms Ammunition Manufacturing	332992	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)

(continued)

Table 3-2. Year 1 Avoided Cost for Sources under ALTERNATIVE SCENARIO 1 (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
			Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 1	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (year 1)	Avoided Costs in Year 1 (excluding permitting cost to state agency)	Average Avoided Cost/ Entity (2017)
Industrial	Ammunition (except Small Arms) Manufacturing	332993	3	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	All Other Miscellaneous Fabricated Metal Product Manufacturing	332999	3	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Farm Machinery and Equipment Manufacturing	333111	8	3	12,267	6,594	-	-	4,715	(3,067)	(1,022)
Industrial	Lawn and Garden Tractor and Home Lawn and Garden Equipment Manufacturing	333112	1	0	-	-	-	-	-	-	-
Industrial	Construction Machinery Manufacturing	333120	64	27	110,403	59,346	(83,894)	11,171	42,439	(27,600)	(1,022)
Industrial	Mining Machinery and Equipment Manufacturing	333131	2	0	-	-	-	-	-	-	-
Industrial	Printing Machinery and Equipment Manufacturing^	333293	1	0	-	-	-	-	-	-	-
Industrial	Photographic and Photocopying Equipment Manufacturing	333316	1	0	-	-	-	-	-	-	-
Industrial	Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing	333415	1	0	-	-	-	-	-	-	-
Industrial	Machine Tool (Metal Cutting Types) Manufacturing^	333512	1	0	-	-	-	-	-	-	-
Industrial	Machine Tool (Metal Forming Types) Manufacturing^	333513	1	0	-	-	-	-	-	-	-
Industrial	Turbine and Turbine Generator Set Units Manufacturing	333611	1	0	-	-	-	-	-	-	-
Industrial	Other Engine Equipment Manufacturing	333618	5	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Overhead Traveling Crane, Hoist, and Monorail System Manufacturing	333923	1	0	-	-	-	-	-	-	-
Industrial	Welding and Soldering Equipment Manufacturing	333992	2	0	-	-	-	-	-	-	-

(continued)

Table 3-2. Year 1 Avoided Cost for Sources under ALTERNATIVE SCENARIO 1 (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
			Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 1	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (year 1)	Avoided Costs in Year 1 (excluding permitting cost to state agency)	Average Avoided Cost/ Entity (2017)
Industrial	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	334220	1	0	-	-	-	-	-	-	
Industrial	Electron Tube Manufacturing^	334411	1	0	-	-	-	-	-	-	
Industrial	Bare Printed Circuit Board Manufacturing	334412	1	0	-	-	-	-	-	-	
Industrial	Semiconductor and Related Device Manufacturing	334413	23	11	44,979	24,178	-	-	16,959	(11,029)	(1,003)
Industrial	Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use	334512	1	0	-	-	-	-	-	-	
Industrial	Blank Magnetic and Optical Recording Media Manufacturing	334613	0	0	-	-	-	-	-	-	
Industrial	Electric Lamp Bulb and Part Manufacturing	335110	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Household Laundry Equipment Manufacturing	335224	13	8	32,712	17,584	(62,087)	1,121	12,574	(8,178)	(1,022)
Industrial	Other Major Household Appliance Manufacturing	335228	2	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Power, Distribution, and Specialty Transformer Manufacturing	335311	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Motor and Generator Manufacturing	335312	2	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Storage Battery Manufacturing	335911	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Current-Carrying Wiring Device Manufacturing	335931	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Noncurrent-Carrying Wiring Device Manufacturing	335932	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Carbon and Graphite Product Manufacturing	335991	6	4	16,356	8,792	-	-	6,287	(4,089)	(1,022)
Industrial	Automobile Manufacturing	336111	66	10	40,890	21,980	(21,775)	374	15,718	(10,222)	(1,022)
Industrial	Light Truck and Utility Vehicle Manufacturing	336112	5	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Heavy Duty Truck Manufacturing	336120	8	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)

(continued)

Table 3-2. Year 1 Avoided Cost for Sources under ALTERNATIVE SCENARIO 1 (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
			Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 1	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (year 1)	Avoided Costs in Year 1 (excluding permitting cost to state agency)	Average Avoided Cost/ Entity (2017)
Industrial	Motor Vehicle Body Manufacturing	336211	8	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Truck Trailer Manufacturing	336212	1	0	-	-	-	-	-	-	-
Industrial	Motor Vehicle Gasoline Engine and Engine Parts Manufacturing	336310	2	0	-	-	-	-	-	-	-
Industrial	Carburetor, Piston, Piston Ring, and Valve Manufacturing^	336311	1	0	-	-	-	-	-	-	-
Industrial	Gasoline Engine and Engine Parts Manufacturing^	336312	3	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing	336330	2	0	-	-	-	-	-	-	-
Industrial	Motor Vehicle Brake System Manufacturing	336340	1	0	-	-	-	-	-	-	-
Industrial	Motor Vehicle Transmission and Power Train Parts Manufacturing	336350	2	0	-	-	-	-	-	-	-
Industrial	Motor Vehicle Seating and Interior Trim Manufacturing	336360	1	0	-	-	-	-	-	-	-
Industrial	Motor Vehicle Metal Stamping	336370	1	0	-	-	-	-	-	-	-
Industrial	Other Motor Vehicle Parts Manufacturing	336390	13	3	12,267	6,594	-	-	4,715	(3,067)	(1,022)
Industrial	All Other Motor Vehicle Parts Manufacturing^	336399	2	0	-	-	-	-	-	-	-
Industrial	Aircraft Manufacturing	336411	125	89	363,921	195,622	\$(2,373,302)	15,507	139,890	(90,978)	(1,022)
Industrial	Aircraft Engine and Engine Parts Manufacturing	336412	8	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Other Aircraft Parts and Auxiliary Equipment Manufacturing	336413	10	3	12,267	6,594	-	-	4,715	(3,067)	(1,022)
Industrial	Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing	336415	1	0	-	-	-	-	-	-	-
Industrial	Railroad Rolling Stock Manufacturing	336510	1	0	-	-	-	-	-	-	-
Industrial	Ship Building and Repairing	336611	92	18	73,602	39,564	(215,000)	2,989	28,292	(18,400)	(1,022)
Industrial	Boat Building	336612	96	16	65,424	35,168	(61,776)	6,703	25,149	(16,356)	(1,022)

(continued)

Table 3-2. Year 1 Avoided Cost for Sources under ALTERNATIVE SCENARIO 1 (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
			Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 1	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (year 1)	Avoided Costs in Year 1 (excluding permitting cost to state agency)	Average Avoided Cost/ Entity (2017)
Industrial	Military Armored Vehicle, Tank, and Tank Component Manufacturing	336992	2	0	-	-	-	-	-	-	-
Industrial	Wood Kitchen Cabinet and Countertop Manufacturing	337110	347	209	854,601	459,382	(455,537)	75,935	328,506	\$(213,645)	(1,022)
Industrial	Upholstered Household Furniture Manufacturing	337121	2	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Nonupholstered Wood Household Furniture Manufacturing	337122	14	8	32,712	17,584	-	-	12,574	(8,178)	(1,022)
Industrial	Institutional Furniture Manufacturing	337127	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Wood Office Furniture Manufacturing	337211	5	4	16,356	8,792	-	-	6,287	(4,089)	(1,022)
Industrial	Office Furniture (except Wood) Manufacturing	337214	19	11	44,979	24,178	(62,165)	1,681	17,290	(11,244)	(1,022)
Industrial	Showcase, Partition, Shelving, and Locker Manufacturing	337215	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Blind and Shade Manufacturing	337920	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Surgical and Medical Instrument Manufacturing	339112	2	0	-	-	-	-	-	-	-
Industrial	Surgical Appliance and Supplies Manufacturing	339113	1	0	-	-	-	-	-	-	-
Industrial	Jewelry and Silverware Manufacturing	339910	1	0	-	-	-	-	-	-	-
Industrial	Sporting and Athletic Goods Manufacturing	339920	1	0	-	-	-	-	-	-	-
Industrial	Office Supplies (except Paper) Manufacturing	339940	1	0	-	-	-	-	-	-	-
Industrial	Gasket, Packing, and Sealing Device Manufacturing	339991	2	0	-	-	-	-	-	-	-
Industrial	Burial Casket Manufacturing	339995	3	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	All Other Miscellaneous Manufacturing	339999	5	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Commercial	Grain and Field Bean Merchant Wholesalers	424510	1	0	-	-	-	-	-	-	-
Commercial	Petroleum Bulk Stations and Terminals	424710	7	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)

(continued)

Table 3-2. Year 1 Avoided Cost for Sources under ALTERNATIVE SCENARIO 1 (2017\$) (continued)

			Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
Sector	NAICS Descriptions	NAICS	Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 1	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (year 1)	Avoided Costs in Year 1 (excluding permitting cost to state agency)	Average Avoided Cost/ Entity (2017)
Commercial	Scheduled Passenger Air Transportation	481111	2	0	-	-	-	-	-	-	-
Commercial	Line-Haul Railroads	482111	1	0	-	-	-	-	-	-	-
Energy	Pipeline Transportation of Crude Oil	486110	1	0	-	-	-	-	-	-	-
Energy	Pipeline Transportation of Natural Gas	486210	257	84	343,476	184,632	(37,555)	12,065	132,031	(85,867)	(1,022)
Energy	Pipeline Transportation of Refined Petroleum Products	486910	1	0	-	-	-	-	-	-	-
Commercial	Support Activities for Rail Transportation	488210	3	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Commercial	Marine Cargo Handling	488320	2	0	-	-	-	-	-	-	-
Commercial	General Warehousing and Storage	493110	180	53	216,717	116,494	(427,127)	98,411	83,305	(54,178)	(1,022)
Commercial	Other Warehousing and Storage	493190	6	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Commercial	Lessors of Nonresidential Buildings (except Miniwarehouses)	531120	1	0	-	-	-	-	-	-	-
Commercial	Testing Laboratories	541380	2	0	-	-	-	-	-	-	-
Commercial	Research and Development in the Physical, Engineering and Life Sciences (except Nanotechnology and Biotechnology)^	541715	2	0	-	-	-	-	-	-	-
Commercial	All Other Support Services	561990	1	0	-	-	-	-	-	-	-
Waste Treatment	Hazardous Waste Treatment and Disposal	562211	41	18	73,602	39,564	(407,350)	7,597	28,292	(18,400)	(1,022)
Waste Treatment	Solid Waste Landfill	562212	6	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Waste Treatment	Solid Waste Combustors and Incinerators	562213	3	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Waste Treatment	Remediation Services	562910	1	0	-	-	-	-	-	-	-
Educational Services	Colleges, Universities, and Professional Schools	611310	23	8	32,712	17,584	-	-	12,574	(8,178)	(1,022)
Commercial	Amusement and Theme Parks	713110	1	0	-	-	-	-	-	-	-
Commercial	Linen and Uniform Supply	812330	1	0	-	-	-	-	-	-	-
Commercial	Industrial Launderers	812332	3	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)

(continued)

Notes:

One-time facility permitting burden is \$4,089 per facility (2017 dollars).

One-time state agency burden is \$2,198 per facility (2017 dollars).

Six source categories in the assessed source categories were identified that would not be affected by the change in policy: Decorative Chromium Electroplating, Hard Chromium Electroplating, Other Chromium Electroplating, Secondary Lead, Wool Fiberglass, and Portland Cement.

Out of these six categories, four area source categories are subject to a MACT standard where area sources in these categories are subject to the same HAP requirement for major sources in these categories: Decorative Chromium Electroplating, Hard Chromium Electroplating, Other Chromium Electroplating and Portland Cement. Because there are no differences in the requirements between major and area sources for these categories, there is no impact of the MM2A policy change on these categories and they were excluded from the table.

For Table 3-2, the two columns—Estimated Costs Savings and Estimated Cost of Area Source Requirements—are incomplete because for the cost categories without completed RTR modeling files, we only have the extrapolated cost or savings for facilities in year 1 and not a breakdown of those cost savings by area source requirement costs or supporting statement cost savings. We have included all of the cost information that is currently available.

The blank cells in the “Average Avoided Cost/Entity” column represent source categories for which there are zero facilities estimated to obtain area source status.

NAICS 922140 (Correctional Institutions), NAICS 927110 (Space Research and Technology), NAICS 928110 (National Security) are government/public administration NAICS codes not covered by the Census. Hence, we have not included them in this table.

NAICS 999999 is an unclassified code and therefore, we have not included it in this table.

Note: The total number of facilities estimated to obtain area source status in this table is less than the sum in Table 1-2 because our analysis excludes Public Administration (NAICS 922140, 927110, and 928110) and Unclassified NAICS Code (999999) because the Census does not report data for these NAICS codes.

Sources: 2012 Economic Census; Eastern Research Group. August 2020a. ERG MM2A Database Memorandum, Analytical Evaluations & Summary of Industries Potentially Impacted by the Final Rule “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD; Eastern Research Group. August 2020b. ERG MM2A Cost Analysis Memorandum, Compliance cost savings analysis for the final rulemaking “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD.

NAICS 2012 and NAICS 2007 (<https://www.census.gov/eos/www/naics/downloadables/downloadables.html>)

Table 3-3. Year 1 Avoided Cost for Sources under ALTERNATIVE SCENARIO 2 (2017\$)

			Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
Sector	NAICS Descriptions	NAICS	Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 2	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (year 1)	Avoided Costs in Year 1 (excluding permitting cost to state agency)	Average Avoided Cost/ Entity (2017)
Agriculture	Postharvest Crop Activities (except Cotton Ginning)	115114	1	0	-	-	-	-	-	-	
Energy	Crude Petroleum and Natural Gas Extraction	211111	120	57	233,073	125,286	(81,512)	22,790	89,592	(58,267)	(1,022)
Energy	Natural Gas Liquid Extraction	211112	26	12	49,068	26,376	-	-	18,862	(12,267)	(1,022)
Industrial	Iron Ore Mining	212210	11	0	-	-	-	-	-	-	
Industrial	Lead Ore and Zinc Ore Mining	212231	1	0	-	-	-	-	-	-	
Industrial	Copper Ore and Nickel Ore Mining	212234	1	0	-	-	-	-	-	-	
Industrial	All Other Metal Ore Mining	212299	1	0	-	-	-	-	-	-	
Industrial	Industrial Sand Mining	212322	3	0	-	-	-	-	-	-	
Industrial	Kaolin and Ball Clay Mining	212324	3	0	-	-	-	-	-	-	
Industrial	Potash, Soda, and Borate Mineral Mining	212391	6	0	-	-	-	-	-	-	
Industrial	All Other Nonmetallic Mineral Mining	212399	1	0	-	-	-	-	-	-	
Energy	Support Activities for Oil and Gas Operations	213112	3	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Utilities	Hydroelectric Power Generation	221111	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Utilities	Fossil Fuel Electric Power Generation	221112	334	100	408,900	219,800	-	-	157,180	\$(102,222)	(1,022)
Utilities	Biomass Electric Power Generation	221117	5	4	16,356	8,792	-	-	6,287	(4,089)	(1,022)
Utilities	Other Electric Power Generation	221118	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Utilities	Other Electric Power Generation^	221119	8	6	24,534	13,188	-	-	9,431	(6,133)	(1,022)
Utilities	Electric Power Distribution	221122	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Utilities	Natural Gas Distribution	221210	13	9	36,801	19,782	-	-	14,146	(9,200)	(1,022)
Utilities	Water Supply and Irrigation Systems	221310	2	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Utilities	Sewage Treatment Facilities	221320	17	12	49,068	26,376	(46)	47	18,862	(12,267)	(1,022)
Utilities	Steam and Air-Conditioning Supply	221330	22	15	61,335	32,970	-	-	23,577	(15,333)	(1,022)
Industrial	Other Animal Food Manufacturing	311119	1	0	-	-	-	-	-	-	
Industrial	Wet Corn Milling	311221	16	0	-	-	-	-	-	-	
Industrial	Soybean Processing^	311222	16	0	-	-	-	-	-	-	
Industrial	Other Oilseed Processing^	311223	5	0	-	-	-	-	-	-	

(continued)

Table 3-3. Year 1 Avoided Cost for Sources under ALTERNATIVE SCENARIO 2 (2017\$) (continued)

			Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
Sector	NAICS Descriptions	NAICS	Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 2	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (year 1)	Avoided Costs in Year 1 (excluding permitting cost to state agency)	Average Avoided Cost/ Entity (2017)
Industrial	Soybean and Other Oilseed Processing	311224	116	2	8,178	4,396	(18,537)	894	3,144	(2,044)	(1,022)
Industrial	Fats and Oils Refining and Blending	311225	2	0	-	-	-	-	-	-	-
Industrial	Beet Sugar Manufacturing	311313	11	0	-	-	-	-	-	-	-
Industrial	Cane Sugar Manufacturing	311314	3	0	-	-	-	-	-	-	-
Industrial	Frozen Fruit, Juice, and Vegetable Manufacturing	311411	2	0	-	-	-	-	-	-	-
Industrial	Fruit and Vegetable Canning	311421	1	0	-	-	-	-	-	-	-
Industrial	Specialty Canning	311422	2	0	-	-	-	-	-	-	-
Industrial	Cheese Manufacturing	311513	2	0	-	-	-	-	-	-	-
Industrial	Dry, Condensed, and Evaporated Dairy Product Manufacturing	311514	3	0	-	-	-	-	-	-	-
Industrial	Rendering and Meat Byproduct Processing	311613	1	0	-	-	-	-	-	-	-
Industrial	Commercial Bakeries	311812	2	0	-	-	-	-	-	-	-
Industrial	Other Snack Food Manufacturing	311919	1	0	-	-	-	-	-	-	-
Industrial	Coffee and Tea Manufacturing	311920	1	0	-	-	-	-	-	-	-
Industrial	Flavoring Syrup and Concentrate Manufacturing	311930	1	0	-	-	-	-	-	-	-
Industrial	Spice and Extract Manufacturing	311942	4	0	-	-	-	-	-	-	-
Industrial	All Other Miscellaneous Food Manufacturing	311999	6	0	-	-	-	-	-	-	-
Industrial	Breweries	312120	3	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Distilleries	312140	1	0	-	-	-	-	-	-	-
Industrial	Tobacco Manufacturing	312230	1	0	-	-	-	-	-	-	-
Industrial	Yarn Spinning Mills^	313111	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Thread Mills^	313113	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Broadwoven Fabric Mills	313210	2	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Narrow Fabric Mills^	313221	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Textile and Fabric Finishing Mills	313310	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Broadwoven Fabric Finishing Mills^	313311	3	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Fabric Coating Mills	313320	50	32	130,848	70,336	(92,072)	5,044	50,298	(32,711)	(1,022)
Industrial	Tire Cord and Tire Fabric Mills^	314992	1	0	-	-	-	-	-	-	-
Industrial	Leather and Hide Tanning and Finishing	316110	6	5	20,445	10,990	(2,391)	560	7,859	(5,111)	(1,022)
Industrial	Sawmills	321113	61	25	102,225	54,950	-	-	39,295	(25,556)	(1,022)

(continued)

Table 3-3. Year 1 Avoided Cost for Sources under ALTERNATIVE SCENARIO 2 (2017\$) (continued)

			Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
Sector	NAICS Descriptions	NAICS	Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 2	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (year 1)	Avoided Costs in Year 1 (excluding permitting cost to state agency)	Average Avoided Cost/ Entity (2017)
Industrial	Wood Preservation	321114	3	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Hardwood Veneer and Plywood Manufacturing	321211	3	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Softwood Veneer and Plywood Manufacturing	321212	29	11	44,979	24,178	-	-	17,290	(11,244)	(1,022)
Industrial	Engineered Wood Member (except Truss) Manufacturing	321213	6	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Reconstituted Wood Product Manufacturing	321219	315	126	515,214	276,948	(569,091)	42,434	198,047	\$(128,800)	(1,022)
Industrial	Wood Window and Door Manufacturing	321911	4	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Cut Stock, Resawing Lumber, and Planing	321912	4	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	All Other Miscellaneous Wood Product Manufacturing	321999	3	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Pulp Mills	322110	18	3	12,267	6,594	-	-	4,715	(3,067)	(1,022)
Industrial	Paper (except Newsprint) Mills	322121	282	14	57,246	30,772	-	-	22,005	(14,311)	(1,022)
Industrial	Newsprint Mills	322122	7	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Paperboard Mills	322130	36	9	36,801	19,782	-	-	14,146	(9,200)	(1,022)
Industrial	Corrugated and Solid Fiber Box Manufacturing	322211	174	68	278,052	149,464	(28,994)	12,704	106,882	(69,511)	(1,022)
Industrial	Paper Bag and Coated and Treated Paper Manufacturing	322220	17	3	12,267	6,594	-	-	4,715	(3,067)	(1,022)
Industrial	Coated and Laminated Paper Manufacturing^	322222	12	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Sanitary Paper Product Manufacturing	322291	2	0	-	-	-	-	-	-	-
Industrial	All Other Converted Paper Product Manufacturing	322299	1	0	-	-	-	-	-	-	-
Industrial	Commercial Lithographic Printing^	323110	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Commercial Printing (except Screen and Books)	323111	188	121	494,769	265,958	(528,822)	20,925	190,188	\$(123,689)	(1,022)
Industrial	Books Printing	323117	3	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Petroleum Refineries	324110	430	88	359,832	193,424	(860,316)	15,650	138,559	(90,662)	(1,030)
Industrial	Asphalt Shingle and Coating Materials Manufacturing	324122	3	0	-	-	-	-	-	-	-

(continued)

Table 3-3. Year 1 Avoided Cost for Sources under ALTERNATIVE SCENARIO 2 (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
			Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 2	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (year 1)	Avoided Costs in Year 1 (excluding permitting cost to state agency)	Average Avoided Cost/ Entity (2017)
Industrial	All Other Petroleum and Coal Products Manufacturing	324199	4	0	-	-	-	-	-	-	-
Industrial	Petrochemical Manufacturing	325110	597	260	1,063,140	571,480	(106,490)	49,704	408,273	\$(265,522)	(1,021)
Industrial	Industrial Gas Manufacturing	325120	4	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Synthetic Dye and Pigment Manufacturing	325130	1	0	-	-	-	-	-	-	-
Industrial	Inorganic Dye and Pigment Manufacturing^	325131	3	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Synthetic Organic Dye and Pigment Manufacturing^	325132	2	0	-	-	-	-	-	-	-
Industrial	Other Basic Inorganic Chemical Manufacturing	325180	10	3	12,267	6,594	-	-	4,715	(3,067)	(1,022)
Industrial	Alkalies and Chlorine Manufacturing^	325181	4	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Carbon Black Manufacturing^	325182	21	8	32,712	17,584	-	-	13,255	(8,620)	(1,078)
Industrial	All Other Basic Inorganic Chemical Manufacturing^	325188	93	5	20,445	10,990	-	-	7,859	(5,111)	(1,022)
Industrial	Cyclic Crude and Intermediate Manufacturing^	325192	1	0	-	-	-	-	-	-	-
Industrial	Ethyl Alcohol Manufacturing	325193	7	3	12,267	6,594	-	-	4,715	(3,067)	(1,022)
Industrial	Cyclic Crude, Intermediate, and Gum and Wood Chemical Manufacturing	325194	2	0	-	-	-	-	-	-	-
Industrial	All Other Basic Organic Chemical Manufacturing	325199	77	28	114,492	61,544	(165,700)	2,733	44,010	(28,622)	(1,022)
Industrial	Plastics Material and Resin Manufacturing	325211	857	341	\$1,394,349	749,518	(2,927,508)	147,682	535,367	\$(348,178)	(1,021)
Industrial	Synthetic Rubber Manufacturing	325212	22	2	8,178	4,396	(225)	547	3,144	(2,044)	(1,022)
Industrial	Artificial and Synthetic Fibers and Filaments Manufacturing	325220	6	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Cellulosic Organic Fiber Manufacturing^	325221	1	0	-	-	-	-	-	-	-
Industrial	Noncellulosic Organic Fiber Manufacturing^	325222	4	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Nitrogenous Fertilizer Manufacturing	325311	16	6	24,534	13,188	-	-	9,431	(6,133)	(1,022)
Industrial	Phosphatic Fertilizer Manufacturing	325312	30	3	12,267	6,594	-	-	4,715	(3,067)	(1,022)

(continued)

Table 3-3. Year 1 Avoided Cost for Sources under ALTERNATIVE SCENARIO 2 (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
			Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 2	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (year 1)	Avoided Costs in Year 1 (excluding permitting cost to state agency)	Average Avoided Cost/ Entity (2017)
Industrial	Pesticide and Other Agricultural Chemical Manufacturing	325320	22	6	24,534	13,188	(91,667)	2,733	9,431	(6,133)	(1,022)
Industrial	Medicinal and Botanical Manufacturing	325411	4	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Pharmaceutical Preparation Manufacturing	325412	36	11	44,979	24,178	(5,511)	4,372	17,290	(11,244)	(1,022)
Industrial	Biological Product (except Diagnostic) Manufacturing	325414	1	0	-	-	-	-	-	-	-
Industrial	Paint and Coating Manufacturing	325510	48	26	106,314	57,148	(862,250)	13,117	40,867	(26,578)	(1,022)
Industrial	Adhesive Manufacturing	325520	4	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Surface Active Agent Manufacturing	325613	2	0	-	-	-	-	-	-	-
Industrial	Toilet Preparation Manufacturing	325620	2	0	-	-	-	-	-	-	-
Industrial	Explosives Manufacturing	325920	2	0	-	-	-	-	-	-	-
Industrial	Custom Compounding of Purchased Resins	325991	5	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Photographic Film, Paper, Plate, and Chemical Manufacturing	325992	4	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	All Other Miscellaneous Chemical Product and Preparation Manufacturing	325998	10	3	12,267	6,594	-	-	4,715	(3,067)	(1,022)
Industrial	Plastics Packaging Film and Sheet (including Laminated) Manufacturing	326112	5	4	16,356	8,792	-	-	6,287	(4,089)	(1,022)
Industrial	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing	326113	16	8	32,712	17,584	-	-	12,574	(8,178)	(1,022)
Industrial	Unlaminated Plastics Profile Shape Manufacturing	326121	12	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Plastics Pipe and Pipe Fitting Manufacturing	326122	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing	326130	7	4	16,356	8,792	-	-	6,287	(4,089)	(1,022)
Industrial	Polystyrene Foam Product Manufacturing	326140	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)

(continued)

Table 3-3. Year 1 Avoided Cost for Sources under ALTERNATIVE SCENARIO 2 (2017\$) (continued)

			Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
Sector	NAICS Descriptions	NAICS	Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 2	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (year 1)	Avoided Costs in Year 1 (excluding permitting cost to state agency)	Average Avoided Cost/ Entity (2017)
Industrial	Urethane and Other Foam Product (except Polystyrene) Manufacturing	326150	19	16	65,424	35,168	(21,096)	1,410	24,843	(16,157)	(1,010)
Industrial	Plastics Plumbing Fixture Manufacturing	326191	2	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	All Other Plastics Product Manufacturing	326199	148	81	331,209	178,038	(721,526)	12,517	127,316	(82,800)	(1,022)
Industrial	Tire Manufacturing (except Retreading)	326211	39	23	94,047	50,554	-	-	35,812	(23,291)	(1,013)
Industrial	Rubber and Plastics Hoses and Belting Manufacturing	326220	6	4	16,356	8,792	-	-	6,287	(4,089)	(1,022)
Industrial	Rubber Product Manufacturing for Mechanical Use	326291	2	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	All Other Rubber Product Manufacturing	326299	14	6	24,534	13,188	-	-	9,431	(6,133)	(1,022)
Industrial	Pottery, Ceramics, and Plumbing Fixture Manufacturing	327110	4	3	12,267	6,594	-	-	3,949	(2,568)	(856)
Industrial	Clay Building Material and Refractories Manufacturing	327120	76	57	233,073	125,286	(230,709)	24,577	89,592	(58,267)	(1,022)
Industrial	Clay Refractory Manufacturing^	327124	8	4	16,356	8,792	-	-	6,338	(4,122)	(1,031)
Industrial	Flat Glass Manufacturing	327211	2	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Other Pressed and Blown Glass and Glassware Manufacturing	327212	17	11	44,979	24,178	(17,054)	2,234	17,290	(11,244)	(1,022)
Industrial	Cement Manufacturing	327310	6	4	16,356	8,792	-	-	6,287	(4,089)	(1,022)
Industrial	Lime Manufacturing	327410	38	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Gypsum Product Manufacturing	327420	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Abrasive Product Manufacturing	327910	4	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Mineral Wool Manufacturing	327993	13	6	24,534	13,188	(18,426)	894	9,431	(6,133)	(1,022)
Industrial	All Other Miscellaneous Nonmetallic Mineral Product Manufacturing	327999	2	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Iron and Steel Mills and Ferroalloy Manufacturing	331110	73	44	179,916	96,712	(392,586)	18,768	69,159	(44,978)	(1,022)
Industrial	Iron and Steel Mills^	331111	50	3	12,267	6,594	-	-	4,715	(3,067)	(1,022)
Industrial	Electrometallurgical Ferroalloy Product Manufacturing^	331112	1	0	-	-	-	-	-	-	

(continued)

Table 3-3. Year 1 Avoided Cost for Sources under ALTERNATIVE SCENARIO 2 (2017\$) (continued)

			Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
Sector	NAICS Descriptions	NAICS	Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 2	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (year 1)	Avoided Costs in Year 1 (excluding permitting cost to state agency)	Average Avoided Cost/ Entity (2017)
Industrial	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel	331210	5	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Rolled Steel Shape Manufacturing	331221	6	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Primary Aluminum Production^	331312	2	0	-	-	-	-	-	-	-
Industrial	Alumina Refining and Primary Aluminum Production	331313	16	2	8,178	4,396	(127,250)	447	3,144	(2,044)	(1,022)
Industrial	Secondary Smelting and Alloying of Aluminum	331314	56	8	32,712	17,584	(14,962)	9,735	12,574	(8,178)	(1,022)
Industrial	Aluminum Sheet, Plate, and Foil Manufacturing	331315	6	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Aluminum Extruded Product Manufacturing^	331316	1	0	-	-	-	-	-	-	-
Industrial	Other Aluminum Rolling, Drawing, and Extruding	331318	2	0	-	-	-	-	-	-	-
Industrial	Nonferrous Metal (except Aluminum) Smelting and Refining	331410	1	0	-	-	-	-	-	-	-
Industrial	Primary Smelting and Refining of Copper^	331411	0	0	-	-	-	-	-	-	-
Industrial	Primary Smelting and Refining of Nonferrous Metal (except Copper and Aluminum)^	331419	2	0	-	-	-	-	-	-	-
Industrial	Copper Rolling, Drawing, Extruding, and Alloying	331420	3	0	-	-	-	-	-	-	-
Industrial	Copper Wire (except Mechanical) Drawing^	331422	1	0	-	-	-	-	-	-	-
Industrial	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, and Extruding	331491	3	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	331492	2	0	-	-	-	-	-	-	-
Industrial	Iron Foundries	331511	59	4	16,356	8,792	-	-	6,287	(4,089)	(1,022)
Industrial	Steel Foundries (except Investment)	331513	2	0	-	-	-	-	-	-	-
Industrial	Aluminum Die-Casting Foundries^	331521	1	0	-	-	-	-	-	-	-

(continued)

Table 3-3. Year 1 Avoided Cost for Sources under ALTERNATIVE SCENARIO 2 (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
			Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 2	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (year 1)	Avoided Costs in Year 1 (excluding permitting cost to state agency)	Average Avoided Cost/ Entity (2017)
Industrial	Aluminum Foundries (except Die-Casting)	331524	2	0	-	-	-	-	-	-	-
Industrial	Nonferrous Forging	332112	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Metal Crown, Closure, and Other Metal Stamping (except Automotive)	332119	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Hand and Edge Tool Manufacturing^	332212	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Prefabricated Metal Building and Component Manufacturing	332311	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Fabricated Structural Metal Manufacturing	332312	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Metal Window and Door Manufacturing	332321	5	5	20,445	10,990	-	-	7,859	(5,111)	(1,022)
Industrial	Sheet Metal Work Manufacturing	332322	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Metal Can Manufacturing	332431	14	11	44,979	24,178	(41,175)	747	17,290	(11,244)	(1,022)
Industrial	Other Metal Container Manufacturing	332439	4	3	12,267	6,594	-	-	4,715	(3,067)	(1,022)
Industrial	Bolt, Nut, Screw, Rivet, and Washer Manufacturing	332722	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Metal Heat Treating	332811	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers	332812	433	332	\$1,357,548	729,736	\$(3,917,226)	59,224	521,837	(339,378)	(1,022)
Industrial	Electroplating, Plating, Polishing, Anodizing, and Coloring	332813	3	3	12,267	6,594	-	-	4,715	(3,067)	(1,022)
Industrial	Other Fabricated Metal Manufacturing	332990	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Small Arms Ammunition Manufacturing	332992	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Ammunition (except Small Arms) Manufacturing	332993	3	3	12,267	6,594	-	-	4,715	(3,067)	(1,022)
Industrial	All Other Miscellaneous Fabricated Metal Product Manufacturing	332999	3	3	12,267	6,594	-	-	4,715	(3,067)	(1,022)
Industrial	Farm Machinery and Equipment Manufacturing	333111	8	3	12,267	6,594	-	-	4,715	(3,067)	(1,022)

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Table 3-3. Year 1 Avoided Cost for Sources under ALTERNATIVE SCENARIO 2 (2017\$) (continued)

			Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
Sector	NAICS Descriptions	NAICS	Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 2	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (year 1)	Avoided Costs in Year 1 (excluding permitting cost to state agency)	Average Avoided Cost/ Entity (2017)
Industrial	Lawn and Garden Tractor and Home Lawn and Garden Equipment Manufacturing	333112	1	0	-	-	-	-	-	-	
Industrial	Construction Machinery Manufacturing	333120	64	30	122,670	65,940	(93,961)	12,512	47,154	(30,667)	(1,022)
Industrial	Mining Machinery and Equipment Manufacturing	333131	2	0	-	-	-	-	-	-	
Industrial	Printing Machinery and Equipment Manufacturing^	333293	1	0	-	-	-	-	-	-	
Industrial	Photographic and Photocopying Equipment Manufacturing	333316	1	0	-	-	-	-	-	-	
Industrial	Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing	333415	1	0	-	-	-	-	-	-	
Industrial	Machine Tool (Metal Cutting Types) Manufacturing^	333512	1	0	-	-	-	-	-	-	
Industrial	Machine Tool (Metal Forming Types) Manufacturing^	333513	1	0	-	-	-	-	-	-	
Industrial	Turbine and Turbine Generator Set Units Manufacturing	333611	1	0	-	-	-	-	-	-	
Industrial	Other Engine Equipment Manufacturing	333618	5	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Overhead Traveling Crane, Hoist, and Monorail System Manufacturing	333923	1	0	-	-	-	-	-	-	
Industrial	Welding and Soldering Equipment Manufacturing	333992	2	0	-	-	-	-	-	-	
Industrial	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	334220	1	0	-	-	-	-	-	-	
Industrial	Electron Tube Manufacturing^	334411	1	0	-	-	-	-	-	-	
Industrial	Bare Printed Circuit Board Manufacturing	334412	1	0	-	-	-	-	-	-	
Industrial	Semiconductor and Related Device Manufacturing	334413	23	15	61,335	32,970	-	-	23,554	(15,318)	(1,021)

(continued)

Table 3-3. Year 1 Avoided Cost for Sources under ALTERNATIVE SCENARIO 2 (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
			Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 2	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (year 1)	Avoided Costs in Year 1 (excluding permitting cost to state agency)	Average Avoided Cost/ Entity (2017)
Industrial	Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use	334512	1	0	-	-	-	-	-	-	-
Industrial	Blank Magnetic and Optical Recording Media Manufacturing	334613	0	0	-	-	-	-	-	-	-
Industrial	Electric Lamp Bulb and Part Manufacturing	335110	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Household Laundry Equipment Manufacturing	335224	13	9	36,801	19,782	(72,435)	1,308	14,146	(9,200)	(1,022)
Industrial	Other Major Household Appliance Manufacturing	335228	2	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Power, Distribution, and Specialty Transformer Manufacturing	335311	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Motor and Generator Manufacturing	335312	2	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Storage Battery Manufacturing	335911	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Current-Carrying Wiring Device Manufacturing	335931	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Noncurrent-Carrying Wiring Device Manufacturing	335932	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Carbon and Graphite Product Manufacturing	335991	6	4	16,356	8,792	-	-	6,287	(4,089)	(1,022)
Industrial	Automobile Manufacturing	336111	66	28	114,492	61,544	(141,540)	2,429	44,010	(28,622)	(1,022)
Industrial	Light Truck and Utility Vehicle Manufacturing	336112	5	4	16,356	8,792	-	-	6,287	(4,089)	(1,022)
Industrial	Heavy Duty Truck Manufacturing	336120	8	5	20,445	10,990	-	-	7,859	(5,111)	(1,022)
Industrial	Motor Vehicle Body Manufacturing	336211	8	5	20,445	10,990	-	-	7,859	(5,111)	(1,022)
Industrial	Truck Trailer Manufacturing	336212	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Motor Vehicle Gasoline Engine and Engine Parts Manufacturing	336310	2	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Carburetor, Piston, Piston Ring, and Valve Manufacturing^	336311	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Gasoline Engine and Engine Parts Manufacturing^	336312	3	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing	336330	2	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)

(continued)

Table 3-3. Year 1 Avoided Cost for Sources under ALTERNATIVE SCENARIO 2 (2017\$) (continued)

			Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
Sector	NAICS Descriptions	NAICS	Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 2	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (year 1)	Avoided Costs in Year 1 (excluding permitting cost to state agency)	Average Avoided Cost/ Entity (2017)
Industrial	Motor Vehicle Brake System Manufacturing	336340	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Motor Vehicle Transmission and Power Train Parts Manufacturing	336350	2	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Motor Vehicle Seating and Interior Trim Manufacturing	336360	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Motor Vehicle Metal Stamping	336370	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Other Motor Vehicle Parts Manufacturing	336390	13	7	28,623	15,386	-	-	11,003	(7,156)	(1,022)
Industrial	All Other Motor Vehicle Parts Manufacturing^	336399	2	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Aircraft Manufacturing	336411	125	107	437,523	235,186	(2,716,430)	17,749	168,182	\$(109,378)	(1,022)
Industrial	Aircraft Engine and Engine Parts Manufacturing	336412	8	5	20,445	10,990	-	-	7,859	(5,111)	(1,022)
Industrial	Other Aircraft Parts and Auxiliary Equipment Manufacturing	336413	10	6	24,534	13,188	-	-	9,431	(6,133)	(1,022)
Industrial	Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing	336415	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Railroad Rolling Stock Manufacturing	336510	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Ship Building and Repairing	336611	92	67	273,963	147,266	(833,125)	11,583	105,310	(68,489)	(1,022)
Industrial	Boat Building	336612	96	35	143,115	76,930	(135,908)	14,746	55,013	(35,778)	(1,022)
Industrial	Military Armored Vehicle, Tank, and Tank Component Manufacturing	336992	2	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Wood Kitchen Cabinet and Countertop Manufacturing	337110	347	263	\$1,075,407	578,074	(571,121)	95,202	413,383	\$(268,845)	(1,022)
Industrial	Upholstered Household Furniture Manufacturing	337121	2	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Industrial	Nonupholstered Wood Household Furniture Manufacturing	337122	14	11	44,979	24,178	-	-	17,290	(11,244)	(1,022)
Industrial	Institutional Furniture Manufacturing	337127	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Wood Office Furniture Manufacturing	337211	5	5	20,445	10,990	-	-	7,859	(5,111)	(1,022)
Industrial	Office Furniture (except Wood) Manufacturing	337214	19	17	69,513	37,366	(96,701)	2,616	26,721	(17,378)	(1,022)

(continued)

Table 3-3. Year 1 Avoided Cost for Sources under ALTERNATIVE SCENARIO 2 (2017\$) (continued)

			Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
Sector	NAICS Descriptions	NAICS	Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 2	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (year 1)	Avoided Costs in Year 1 (excluding permitting cost to state agency)	Average Avoided Cost/ Entity (2017)
Industrial	Showcase, Partition, Shelving, and Locker Manufacturing	337215	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Blind and Shade Manufacturing	337920	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	Surgical and Medical Instrument Manufacturing	339112	2	0	-	-	-	-	-	-	-
Industrial	Surgical Appliance and Supplies Manufacturing	339113	1	0	-	-	-	-	-	-	-
Industrial	Jewelry and Silverware Manufacturing	339910	1	0	-	-	-	-	-	-	-
Industrial	Sporting and Athletic Goods Manufacturing	339920	1	0	-	-	-	-	-	-	-
Industrial	Office Supplies (except Paper) Manufacturing	339940	1	0	-	-	-	-	-	-	-
Industrial	Gasket, Packing, and Sealing Device Manufacturing	339991	2	0	-	-	-	-	-	-	-
Industrial	Burial Casket Manufacturing	339995	3	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Industrial	All Other Miscellaneous Manufacturing	339999	5	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Commercial	Grain and Field Bean Merchant Wholesalers	424510	1	0	-	-	-	-	-	-	-
Commercial	Petroleum Bulk Stations and Terminals	424710	7	3	12,267	6,594	-	-	4,715	(3,067)	(1,022)
Commercial	Scheduled Passenger Air Transportation	481111	2	0	-	-	-	-	-	-	-
Commercial	Line-Haul Railroads	482111	1	0	-	-	-	-	-	-	-
Energy	Pipeline Transportation of Crude Oil	486110	1	0	-	-	-	-	-	-	-
Energy	Pipeline Transportation of Natural Gas	486210	257	123	502,947	270,354	(55,636)	17,874	193,331	\$(125,734)	(1,022)
Energy	Pipeline Transportation of Refined Petroleum Products	486910	1	0	-	-	-	-	-	-	-
Commercial	Support Activities for Rail Transportation	488210	3	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Commercial	Marine Cargo Handling	488320	2	0	-	-	-	-	-	-	-
Commercial	General Warehousing and Storage	493110	180	65	265,785	142,870	(523,835)	120,693	102,167	(66,445)	(1,022)
Commercial	Other Warehousing and Storage	493190	6	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)

(continued)

Table 3-3. Year 1 Avoided Cost for Sources under ALTERNATIVE SCENARIO 2 (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Permitting Cost (2017)		Year 1 Portion (\$/yr)		Cost (\$)		
			Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 2	Facility	State Agency	Estimated Costs (Savings)	Estimated Cost of Area Source Requirement	Estimated Net Costs (Savings) (year 1)	Avoided Costs in Year 1 (excluding permitting cost to state agency)	Average Avoided Cost/ Entity (2017)
Commercial	Lessors of Nonresidential Buildings (except Miniwarehouses)	531120	1	0	-	-	-	-	-	-	-
Commercial	Testing Laboratories	541380	2	0	-	-	-	-	-	-	-
Commercial	Research and Development in the Physical, Engineering and Life Sciences (except Nanotechnology and Biotechnology)^^	541715	2	0	-	-	-	-	-	-	-
Commercial	All Other Support Services	561990	1	0	-	-	-	-	-	-	-
Waste Treatment	Hazardous Waste Treatment and Disposal	562211	41	27	110,403	59,346	(599,044)	11,171	42,439	(27,600)	(1,022)
Waste Treatment	Solid Waste Landfill	562212	6	4	16,356	8,792	-	-	6,287	(4,089)	(1,022)
Waste Treatment	Solid Waste Combustors and Incinerators	562213	3	2	8,178	4,396	-	-	3,144	(2,044)	(1,022)
Waste Treatment	Remediation Services	562910	1	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)
Educational Services	Colleges, Universities, and Professional Schools	611310	23	11	44,979	24,178	-	-	17,290	(11,244)	(1,022)
Commercial	Amusement and Theme Parks	713110	1	0	-	-	-	-	-	-	-
Commercial	Linen and Uniform Supply	812330	1	0	-	-	-	-	-	-	-
Commercial	Industrial Launderers	812332	3	1	4,089	2,198	-	-	1,572	(1,022)	(1,022)

Notes:

One-time facility permitting burden is \$4,089 per facility (2017 dollars).

One-time state agency burden is \$2,198 per facility (2017 dollars).

Six source categories in the assessed source categories were identified that would not be affected by the change in policy: Decorative Chromium Electroplating, Hard Chromium Electroplating, Other Chromium Electroplating, Secondary Lead, Wool Fiberglass, and Portland Cement.

Out of these six categories, four area source categories are subject to a MACT standard where area sources in these categories are subject to the same HAP requirement for major sources in these categories: Decorative Chromium Electroplating, Hard Chromium Electroplating, Other Chromium Electroplating and Portland Cement. Because there are no differences in the requirements between major and area sources for these categories, there is no impact of the MM2A policy change on these categories and they were excluded from the table.

For Table 3-3, two columns—Estimated Costs Savings and Estimated Cost of Area Source Requirements—are incomplete because for the cost categories without completed RTR modeling files, we only have the extrapolated cost or savings for facilities in year 1 and not a breakdown of those cost savings by area source requirement costs or supporting statement cost savings. We have included all of the cost information that is currently available.

The blank cells in the “Average Avoided Cost/Entity” column represent source categories for which there are zero facilities estimated to obtain area source status.

For the not directly assessed Source Category “Pulp & Paper (non-combust) MACT” (NAICS 322121), one facility is extrapolated to obtain area source status. However, in the estimation of Extrapolated Costs (Savings), “No facilities are expected to be area sources.” We assume the same when calculating the number of facilities expected to obtain area source status for this not directly assessed category.

NAICS 922140 (Correctional Institutions), NAICS 927110 (Space Research and Technology), NAICS 928110 (National Security) are government/public administration NAICS codes not covered by the Census. Hence, we have not included them in this table.

NAICS 999999 is an unclassified code and therefore, we have not included it in this table.

Note: The total number of facilities estimated to obtain area source status in this table is less than the sum in Table 1-3 because our analysis excludes Public Administration (NAICS 922140, 927110, and 928110) and Unclassified NAICS Code (999999) because the Census does not report data for these NAICS codes.

Sources: 2012 Economic Census, NAICS 2012, NAICS 2007; Eastern Research Group. August 2020a. ERG MM2A Database Memorandum, Analytical Evaluations & Summary of Industries Potentially Impacted by the Final Rule “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD; Eastern Research Group. August 2020b. ERG MM2A Cost Analysis Memorandum, Compliance cost savings analysis for the final rulemaking “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD.

NAICS 2012 and NAICS 2007 (<https://www.census.gov/eos/www/naics/downloadables/downloadables.html>).

3.2 Year 5 Avoided Cost for Sources Affected by the Final MM2A Rule

As mentioned earlier in this RIA, the EPA assumed that all potential reclassifications will occur over a 5-year time period. Tables 3-4 through 3-6 below show the avoided costs in year 5 (2025 and beyond), once all potential reclassifications have happened for each source. With the final MM2A rule, in year 5, there will be no area source permitting costs to the facility or the state agency. This is because it is assumed that the permitting changes are all completed in year 1 for each reclassification and there is no permitting action in year 5. Therefore, the only costs to the affected facilities in year 5 are the area source burden requirements. For the categories with completed RTR modeling files, the annual estimated cost savings in year 5 are the annual monitoring, recordkeeping, and reporting (as included in supporting statements) costs for the facilities expected to obtain area source status. The avoided costs in year 5 are the sum of the estimated cost of area source requirements and the annual estimated cost savings from not having to comply with the major source NESHAP rule.

For the categories without completed RTR modeling files, the EPA used 3-digit NAICS codes to match each extrapolated category to the directly assessed source categories with RTR data. Then, the EPA calculated the sum of estimated cost savings in year 5 of the source categories that were matched to the extrapolated category. Next, the EPA determined the average cost savings for year 5 for the matched source categories and used these to determine the cost savings for the extrapolated category in year 5. The MM2A Cost Analysis Memorandum describes how these categories were assessed in greater detail. RICE was not included in the cost analysis because the compliance requirement for major and area sources are the same for this category.

Table 3-4 shows the avoided costs in year 5 for the categories with completed RTR modeling files and the extrapolated categories under the primary scenario. The average avoided cost per entity is calculated using the average estimated net cost savings in year 5 for the facilities affected. Table 3-5 shows the avoided costs in year 5 under alternative scenario 1. Table 3-6 shows the avoided costs in year 5 under alternative scenario 2.

Table 3-4. Year 5 Avoided Cost for Sources under the PRIMARY SCENARIO (2017\$)

Sector	NAICS Descriptions	NAICS	Facilities		Year 5 (\$/Year)		Cost (\$)	
			Number of Facilities Subject to MACT	Number of Facilities Under the Primary Scenario	Estimated Costs (Savings)	Estimated Cost of Area Source Requirements	Avoided Costs Year 5	Average Avoided Cost/Entity (2017)
Agriculture	Postharvest Crop Activities (except Cotton Ginning)	115114	1	0	-	-	-	-
Energy	Crude Petroleum and Natural Gas Extraction	211111	120	48	(268,511)	75,072	494,197	10,296
Energy	Natural Gas Liquid Extraction	211112	26	11	-	-	411,198	37,382
Industrial	Iron Ore Mining	212210	11	0	-	-	-	-
Industrial	Lead Ore and Zinc Ore Mining	212231	1	0	-	-	-	-
Industrial	Copper Ore and Nickel Ore Mining	212234	1	0	-	-	-	-
Industrial	All Other Metal Ore Mining	212299	1	0	-	-	-	-
Industrial	Industrial Sand Mining	212322	3	0	-	-	-	-
Industrial	Kaolin and Ball Clay Mining	212324	3	0	-	-	-	-
Industrial	Potash, Soda, and Borate Mineral Mining	212391	6	0	-	-	-	-
Industrial	All Other Nonmetallic Mineral Mining	212399	1	0	-	-	-	-
Energy	Support Activities for Oil and Gas Operations	213112	3	1	-	-	15,247	15,247
Utilities	Hydroelectric Power Generation	221111	1	1	-	-	15,247	15,247
Utilities	Fossil Fuel Electric Power Generation	221112	334	100	-	-	4,018,555	40,186
Utilities	Biomass Electric Power Generation	221117	5	4	-	-	253,162	63,290
Utilities	Other Electric Power Generation	221118	1	1	-	-	15,247	15,247
Utilities	Other Electric Power Generation^	221119	8	6	-	-	300,758	50,126
Utilities	Electric Power Distribution	221122	1	1	-	-	15,247	15,247
Utilities	Natural Gas Distribution	221210	13	9	-	-	363,601	40,400
Utilities	Water Supply and Irrigation Systems	221310	2	2	-	-	47,596	23,798
Utilities	Sewage Treatment Facilities	221320	17	12	(185)	189	268,404	22,367
Utilities	Steam and Air-Conditioning Supply	221330	22	15	-	-	490,519	32,701
Industrial	Other Animal Food Manufacturing	311119	1	0	-	-	-	-
Industrial	Wet Corn Milling	311221	16	0	-	-	-	-
Industrial	Soybean Processing^	311222	16	0	-	-	-	-
Industrial	Other Oilseed Processing^	311223	5	0	-	-	-	-
Industrial	Soybean and Other Oilseed Processing	311224	116	2	(74,149)	3,575	70,574	35,287
Industrial	Fats and Oils Refining and Blending	311225	2	0	-	-	-	-
Industrial	Beet Sugar Manufacturing	311313	11	0	-	-	-	-
Industrial	Cane Sugar Manufacturing	311314	3	0	-	-	-	-
Industrial	Frozen Fruit, Juice, and Vegetable Manufacturing	311411	2	0	-	-	-	-
Industrial	Fruit and Vegetable Canning	311421	1	0	-	-	-	-
Industrial	Specialty Canning	311422	2	0	-	-	-	-
Industrial	Cheese Manufacturing	311513	2	0	-	-	-	-
Industrial	Dry, Condensed, and Evaporated Dairy Product Manufacturing	311514	3	0	-	-	-	-
Industrial	Rendering and Meat Byproduct Processing	311613	1	0	-	-	-	-

(continued)

Table 3-4. Year 5 Avoided Cost for Sources under the PRIMARY SCENARIO (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Year 5 (\$/Year)		Cost (\$)	
			Number of Facilities Subject to MACT	Number of Facilities Under the Primary Scenario	Estimated Costs (Savings)	Estimated Cost of Area Source Requirements	Avoided Costs Year 5	Average Avoided Cost/Entity (2017)
Industrial	Commercial Bakeries	311812	2	0	-	-	-	
Industrial	Other Snack Food Manufacturing	311919	1	0	-	-	-	
Industrial	Coffee and Tea Manufacturing	311920	1	0	-	-	-	
Industrial	Flavoring Syrup and Concentrate Manufacturing	311930	1	0	-	-	-	
Industrial	Spice and Extract Manufacturing	311942	4	0	-	-	-	
Industrial	All Other Miscellaneous Food Manufacturing	311999	6	0	-	-	-	
Industrial	Breweries	312120	3	1	-	-	15,247	15,247
Industrial	Distilleries	312140	1	0	-	-	-	
Industrial	Tobacco Manufacturing	312230	1	0	-	-	-	
Industrial	Yarn Spinning Mills^	313111	1	1	-	-	15,247	15,247
Industrial	Thread Mills^	313113	1	1	-	-	15,247	15,247
Industrial	Broadwoven Fabric Mills	313210	2	2	-	-	47,596	23,798
Industrial	Narrow Fabric Mills^	313221	1	1	-	-	15,247	15,247
Industrial	Textile and Fabric Finishing Mills	313310	1	1	-	-	15,247	15,247
Industrial	Broadwoven Fabric Finishing Mills^	313311	3	2	-	-	47,596	23,798
Industrial	Fabric Coating Mills	313320	50	28	(327,367)	17,935	562,594	20,093
Industrial	Tire Cord and Tire Fabric Mills^	314992	1	0	-	-	-	
Industrial	Leather and Hide Tanning and Finishing	316110	6	4	(6,375)	1,495	52,477	13,119
Industrial	Sawmills	321113	61	11	-	-	411,198	37,382
Industrial	Wood Preservation	321114	3	0	-	-	-	
Industrial	Hardwood Veneer and Plywood Manufacturing	321211	3	0	-	-	-	
Industrial	Softwood Veneer and Plywood Manufacturing	321212	29	6	-	-	300,758	50,126
Industrial	Engineered Wood Member (except Truss) Manufacturing	321213	6	1	-	-	15,247	15,247
Industrial	Reconstituted Wood Product Manufacturing	321219	315	61	(1,211,278)	67,105	1,444,931	23,687
Industrial	Wood Window and Door Manufacturing	321911	4	0	-	-	-	
Industrial	Cut Stock, Resawing Lumber, and Planing	321912	4	0	-	-	-	
Industrial	All Other Miscellaneous Wood Product Manufacturing	321999	3	0	-	-	-	
Industrial	Pulp Mills	322110	18	3	-	-	62,843	20,948
Industrial	Paper (except Newsprint) Mills	322121	282	33	-	-	411,198	12,461
Industrial	Newsprint Mills	322122	7	1	-	-	15,247	15,247
Industrial	Paperboard Mills	322130	36	7	-	-	316,005	45,144
Industrial	Corrugated and Solid Fiber Box Manufacturing	322211	174	55	(93,803)	41,102	52,701	958
Industrial	Paper Bag and Coated and Treated Paper Manufacturing	322220	17	3	-	-	62,843	20,948
Industrial	Coated and Laminated Paper Manufacturing^	322222	12	2	-	-	47,596	23,798
Industrial	Sanitary Paper Product Manufacturing	322291	2	0	-	-	-	
Industrial	All Other Converted Paper Product Manufacturing	322299	1	0	-	-	-	
Industrial	Commercial Lithographic Printing^	323110	1	1	-	-	15,247	15,247
Industrial	Commercial Printing (except Screen and Books)	323111	188	110	(1,907,536)	75,478	2,195,659	19,961

(continued)

Table 3-4. Year 5 Avoided Cost for Sources under the PRIMARY SCENARIO (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Year 5 (\$/Year)		Cost (\$)	
			Number of Facilities Subject to MACT	Number of Facilities Under the Primary Scenario	Estimated Costs (Savings)	Estimated Cost of Area Source Requirements	Avoided Costs Year 5	Average Avoided Cost/Entity (2017)
Industrial	Books Printing	323117	3	2	-	-	47,596	23,798
Industrial	Petroleum Refineries	324110	430	77	(3,071,158)	56,042	7,555,577	98,124
Industrial	Asphalt Shingle and Coating Materials Manufacturing	324122	3	0	-	-	-	-
Industrial	All Other Petroleum and Coal Products Manufacturing	324199	4	0	-	-	-	-
Industrial	Petrochemical Manufacturing	325110	597	218	(413,309)	182,730	3,620,549	16,608
Industrial	Industrial Gas Manufacturing	325120	4	1	-	-	15,247	15,247
Industrial	Synthetic Dye and Pigment Manufacturing	325130	1	0	-	-	-	-
Industrial	Inorganic Dye and Pigment Manufacturing^	325131	3	1	-	-	15,247	15,247
Industrial	Synthetic Organic Dye and Pigment Manufacturing^	325132	2	0	-	-	-	-
Industrial	Other Basic Inorganic Chemical Manufacturing	325180	10	3	-	-	62,843	20,948
Industrial	Alkalies and Chlorine Manufacturing^	325181	4	1	-	-	24,362	24,362
Industrial	Carbon Black Manufacturing^	325182	21	7	-	-	193,443	27,635
Industrial	All Other Basic Inorganic Chemical Manufacturing^	325188	93	28	-	-	792,076	28,288
Industrial	Cyclic Crude and Intermediate Manufacturing^	325192	1	0	-	-	-	-
Industrial	Ethyl Alcohol Manufacturing	325193	7	2	-	-	47,596	23,798
Industrial	Cyclic Crude, Intermediate, and Gum and Wood Chemical Manufacturing	325194	2	0	-	-	-	-
Industrial	All Other Basic Organic Chemical Manufacturing	325199	77	23	(530,241)	8,745	1,265,177	55,008
Industrial	Plastics Material and Resin Manufacturing	325211	857	254	(7,647,034)	435,787	7,943,793	31,275
Industrial	Synthetic Rubber Manufacturing	325212	22	2	(900)	2,186	13,961	6,981
Industrial	Artificial and Synthetic Fibers and Filaments Manufacturing	325220	6	2	-	-	47,596	23,798
Industrial	Cellulosic Organic Fiber Manufacturing^	325221	1	0	-	-	-	-
Industrial	Noncellulosic Organic Fiber Manufacturing^	325222	8	3	-	-	60,824	20,275
Industrial	Nitrogenous Fertilizer Manufacturing	325311	16	6	-	-	300,758	50,126
Industrial	Phosphatic Fertilizer Manufacturing	325312	30	2	-	-	47,596	23,798
Industrial	Pesticide and Other Agricultural Chemical Manufacturing	325320	22	5	(293,333)	8,745	299,836	59,967
Industrial	Medicinal and Botanical Manufacturing	325411	4	1	-	-	15,247	15,247
Industrial	Pharmaceutical Preparation Manufacturing	325412	36	9	(16,533)	13,117	66,260	7,362
Industrial	Biological Product (except Diagnostic) Manufacturing	325414	1	0	-	-	-	-
Industrial	Paint and Coating Manufacturing	325510	48	19	(2,443,042)	37,164	2,453,475	129,130
Industrial	Adhesive Manufacturing	325520	4	1	-	-	15,247	15,247
Industrial	Surface Active Agent Manufacturing	325613	2	0	-	-	-	-
Industrial	Toilet Preparation Manufacturing	325620	2	0	-	-	-	-
Industrial	Explosives Manufacturing	325920	2	0	-	-	-	-
Industrial	Custom Compounding of Purchased Resins	325991	5	2	-	-	47,596	23,798
Industrial	Photographic Film, Paper, Plate, and Chemical Manufacturing	325992	4	1	-	-	15,247	15,247
Industrial	All Other Miscellaneous Chemical Product and Preparation Manufacturing	325998	10	3	-	-	62,843	20,948

(continued)

Table 3-4. Year 5 Avoided Cost for Sources under the PRIMARY SCENARIO (2017\$)

Sector	NAICS Descriptions	NAICS	Facilities		Year 5 (\$/Year)		Cost (\$)	
			Number of Facilities Subject to MACT	Number of Facilities Under the Primary Scenario	Estimated Costs (Savings)	Estimated Cost of Area Source Requirements	Avoided Costs Year 5	Average Avoided Cost/Entity (2017)
Industrial	Plastics Packaging Film and Sheet (including Laminated) Manufacturing	326112	5	2	-	-	47,596	23,798
Industrial	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing	326113	16	7	-	-	316,005	45,144
Industrial	Unlaminated Plastics Profile Shape Manufacturing	326121	12	0	-	-	-	-
Industrial	Plastics Pipe and Pipe Fitting Manufacturing	326122	1	0	-	-	-	-
Industrial	Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing	326130	7	3	-	-	62,843	20,948
Industrial	Polystyrene Foam Product Manufacturing	326140	1	0	-	-	-	-
Industrial	Urethane and Other Foam Product (except Polystyrene) Manufacturing	326150	19	13	(84,386)	5,639	162,278	12,483
Industrial	Plastics Plumbing Fixture Manufacturing	326191	2	0	-	-	-	-
Industrial	All Other Plastics Product Manufacturing	326199	148	64	(2,283,037)	39,608	2,654,627	41,479
Industrial	Tire Manufacturing (except Retreading)	326211	39	19	-	-	714,434	37,602
Industrial	Rubber and Plastics Hoses and Belting Manufacturing	326220	6	2	-	-	47,596	23,798
Industrial	Rubber Product Manufacturing for Mechanical Use	326291	2	0	-	-	-	-
Industrial	All Other Rubber Product Manufacturing	326299	14	5	-	-	110,439	22,088
Industrial	Pottery, Ceramics, and Plumbing Fixture Manufacturing	327110	4	1	-	-	20,052	20,052
Industrial	Clay Building Material and Refractories Manufacturing	327120	76	47	(788,607)	84,009	704,598	14,991
Industrial	Clay Refractory Manufacturing^	327124	8	3	-	-	53,473	17,824
Industrial	Flat Glass Manufacturing	327211	2	0	-	-	-	-
Industrial	Other Pressed and Blown Glass and Glassware Manufacturing	327212	17	7	(54,571)	7,150	110,265	15,752
Industrial	Cement Manufacturing	327310	6	2	-	-	47,596	23,798
Industrial	Lime Manufacturing	327410	38	1	-	-	15,247	15,247
Industrial	Gypsum Product Manufacturing	327420	1	0	-	-	-	-
Industrial	Abrasive Product Manufacturing	327910	4	1	-	-	15,247	15,247
Industrial	Mineral Wool Manufacturing	327993	13	4	(73,704)	3,575	117,726	29,431
Industrial	All Other Miscellaneous Nonmetallic Mineral Product Manufacturing	327999	2	0	-	-	-	-
Industrial	Iron and Steel Mills and Ferroalloy Manufacturing	331110	73	39	(1,383,399)	66,135	1,364,860	34,996
Industrial	Iron and Steel Mills^	331111	50	3	-	-	62,843	20,948
Industrial	Electrometallurgical Ferroalloy Product Manufacturing^	331112	1	0	-	-	-	-
Industrial	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel	331210	5	2	-	-	47,596	23,798
Industrial	Rolled Steel Shape Manufacturing	331221	6	2	-	-	47,596	23,798
Industrial	Primary Aluminum Production^	331312	2	0	-	-	-	-
Industrial	Alumina Refining and Primary Aluminum Production	331313	16	2	(508,999)	1,787	522,459	261,229

(continued)

Table 3-4. Year 5 Avoided Cost for Sources under the PRIMARY SCENARIO (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Year 5 (\$/Year)		Cost (\$)	
			Number of Facilities Subject to MACT	Number of Facilities Under the Primary Scenario	Estimated Costs (Savings)	Estimated Cost of Area Source Requirements	Avoided Costs Year 5	Average Avoided Cost/Entity (2017)
Industrial	Secondary Smelting and Alloying of Aluminum	331314	56	7	(51,297)	33,376	33,168	4,738
Industrial	Aluminum Sheet, Plate, and Foil Manufacturing	331315	6	2	-	-	47,596	23,798
Industrial	Aluminum Extruded Product Manufacturing^	331316	1	0	-	-	-	-
Industrial	Other Aluminum Rolling, Drawing, and Extruding	331318	2	0	-	-	-	-
Industrial	Nonferrous Metal (except Aluminum) Smelting and Refining	331410	1	0	-	-	-	-
Industrial	Primary Smelting and Refining of Copper^	331411	0	0	-	-	-	-
Industrial	Primary Smelting and Refining of Nonferrous Metal (except Copper and Aluminum)^	331419	2	0	-	-	-	-
Industrial	Copper Rolling, Drawing, Extruding, and Alloying	331420	3	0	-	-	-	-
Industrial	Copper Wire (except Mechanical) Drawing^	331422	1	0	-	-	-	-
Industrial	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, and Extruding	331491	3	1	-	-	15,247	15,247
Industrial	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	331492	2	0	-	-	-	-
Industrial	Iron Foundries	331511	59	4	-	-	253,162	63,290
Industrial	Steel Foundries (except Investment)	331513	2	0	-	-	-	-
Industrial	Aluminum Die-Casting Foundries^	331521	1	0	-	-	-	-
Industrial	Aluminum Foundries (except Die-Casting)	331524	2	0	-	-	-	-
Industrial	Nonferrous Forging	332112	1	1	-	-	15,247	15,247
Industrial	Metal Crown, Closure, and Other Metal Stamping (except Automotive)	332119	1	1	-	-	15,247	15,247
Industrial	Hand and Edge Tool Manufacturing^	332212	1	1	-	-	15,247	15,247
Industrial	Prefabricated Metal Building and Component Manufacturing	332311	1	1	-	-	15,247	15,247
Industrial	Fabricated Structural Metal Manufacturing	332312	1	1	-	-	15,247	15,247
Industrial	Metal Window and Door Manufacturing	332321	5	4	-	-	253,162	63,290
Industrial	Sheet Metal Work Manufacturing	332322	1	1	-	-	15,247	15,247
Industrial	Metal Can Manufacturing	332431	14	9	(123,526)	2,242	422,042	46,894
Industrial	Other Metal Container Manufacturing	332439	4	2	-	-	47,596	23,798
Industrial	Bolt, Nut, Screw, Rivet, and Washer Manufacturing	332722	1	1	-	-	15,247	15,247
Industrial	Metal Heat Treating	332811	1	1	-	-	15,247	15,247
Industrial	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers	332812	433	280	(13,181,179)	200,280	13,408,575	47,888
Industrial	Electroplating, Plating, Polishing, Anodizing, and Coloring	332813	3	2	-	-	47,596	23,798
Industrial	Other Fabricated Metal Manufacturing	332990	1	1	-	-	15,247	15,247
Industrial	Small Arms Ammunition Manufacturing	332992	1	1	-	-	15,247	15,247
Industrial	Ammunition (except Small Arms) Manufacturing	332993	3	2	-	-	47,596	23,798
Industrial	All Other Miscellaneous Fabricated Metal Product Manufacturing	332999	3	2	-	-	47,596	23,798
Industrial	Farm Machinery and Equipment Manufacturing	333111	8	3	-	-	62,843	20,948

(continued)

Table 3-4. Year 5 Avoided Cost for Sources under the PRIMARY SCENARIO (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Year 5 (\$/Year)		Cost (\$)	
			Number of Facilities Subject to MACT	Number of Facilities Under the Primary Scenario	Estimated Costs (Savings)	Estimated Cost of Area Source Requirements	Avoided Costs Year 5	Average Avoided Cost/Entity (2017)
Industrial	Lawn and Garden Tractor and Home Lawn and Garden Equipment Manufacturing	333112	1	0	-	-	-	
Industrial	Construction Machinery Manufacturing	333120	64	28	(348,998)	46,473	350,121	12,504
Industrial	Mining Machinery and Equipment Manufacturing	333131	2	0	-	-	-	
Industrial	Printing Machinery and Equipment Manufacturing^	333293	1	0	-	-	-	
Industrial	Photographic and Photocopying Equipment Manufacturing	333316	1	0	-	-	-	
Industrial	Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing	333415	1	0	-	-	-	
Industrial	Machine Tool (Metal Cutting Types) Manufacturing^	333512	1	0	-	-	-	
Industrial	Machine Tool (Metal Forming Types) Manufacturing^	333513	1	0	-	-	-	
Industrial	Turbine and Turbine Generator Set Units Manufacturing	333611	1	0	-	-	-	
Industrial	Other Engine Equipment Manufacturing	333618	5	2	-	-	47,596	23,798
Industrial	Overhead Traveling Crane, Hoist, and Monorail System Manufacturing	333923	1	0	-	-	-	
Industrial	Welding and Soldering Equipment Manufacturing	333992	2	0	-	-	-	
Industrial	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	334220	1	0	-	-	-	
Industrial	Electron Tube Manufacturing^	334411	1	0	-	-	-	
Industrial	Bare Printed Circuit Board Manufacturing	334412	1	0	-	-	-	
Industrial	Semiconductor and Related Device Manufacturing	334413	23	13	-	-	533,693	41,053
Industrial	Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use	334512	1	0	-	-	-	
Industrial	Blank Magnetic and Optical Recording Media Manufacturing	334613	0	0	-	-	-	
Industrial	Electric Lamp Bulb and Part Manufacturing	335110	1	1	-	-	15,247	15,247
Industrial	Household Laundry Equipment Manufacturing	335224	13	9	(289,742)	5,231	332,107	36,901
Industrial	Other Major Household Appliance Manufacturing	335228	2	2	-	-	47,596	23,798
Industrial	Power, Distribution, and Specialty Transformer Manufacturing	335311	1	1	-	-	15,247	15,247
Industrial	Motor and Generator Manufacturing	335312	2	2	-	-	47,596	23,798
Industrial	Storage Battery Manufacturing	335911	1	1	-	-	15,247	15,247
Industrial	Current-Carrying Wiring Device Manufacturing	335931	1	1	-	-	15,247	15,247
Industrial	Noncurrent-Carrying Wiring Device Manufacturing	335932	1	1	-	-	15,247	15,247
Industrial	Carbon and Graphite Product Manufacturing	335991	6	4	-	-	253,162	63,290
Industrial	Automobile Manufacturing	336111	66	18	(217,754)	3,737	832,012	46,223
Industrial	Light Truck and Utility Vehicle Manufacturing	336112	5	4	-	-	253,162	63,290
Industrial	Heavy Duty Truck Manufacturing	336120	8	5	-	-	285,511	57,102
Industrial	Motor Vehicle Body Manufacturing	336211	8	5	-	-	285,511	57,102

(continued)

Table 3-4. Year 5 Avoided Cost for Sources under the PRIMARY SCENARIO (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Year 5 (\$/Year)		Cost (\$)	
			Number of Facilities Subject to MACT	Number of Facilities Under the Primary Scenario	Estimated Costs (Savings)	Estimated Cost of Area Source Requirements	Avoided Costs Year 5	Average Avoided Cost/Entity (2017)
Industrial	Truck Trailer Manufacturing	336212	1	1	-	-	15,247	15,247
Industrial	Motor Vehicle Gasoline Engine and Engine Parts Manufacturing	336310	2	2	-	-	47,596	23,798
Industrial	Carburetor, Piston, Piston Ring, and Valve Manufacturing^	336311	1	1	-	-	15,247	15,247
Industrial	Gasoline Engine and Engine Parts Manufacturing^	336312	3	2	-	-	47,596	23,798
Industrial	Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing	336330	2	2	-	-	47,596	23,798
Industrial	Motor Vehicle Brake System Manufacturing	336340	1	1	-	-	15,247	15,247
Industrial	Motor Vehicle Transmission and Power Train Parts Manufacturing	336350	2	2	-	-	47,596	23,798
Industrial	Motor Vehicle Seating and Interior Trim Manufacturing	336360	1	1	-	-	15,247	15,247
Industrial	Motor Vehicle Metal Stamping	336370	1	1	-	-	15,247	15,247
Industrial	Other Motor Vehicle Parts Manufacturing	336390	13	7	-	-	316,005	45,144
Industrial	All Other Motor Vehicle Parts Manufacturing^	336399	2	2	-	-	47,596	23,798
Industrial	Aircraft Manufacturing	336411	125	102	(10,522,592)	68,753	10,833,918	106,215
Industrial	Aircraft Engine and Engine Parts Manufacturing	336412	8	5	-	-	285,511	57,102
Industrial	Other Aircraft Parts and Auxiliary Equipment Manufacturing	336413	10	6	-	-	300,758	50,126
Industrial	Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing	336415	1	1	-	-	15,247	15,247
Industrial	Railroad Rolling Stock Manufacturing	336510	1	1	-	-	15,247	15,247
Industrial	Ship Building and Repairing	336611	92	55	(2,687,500)	37,366	2,935,646	53,375
Industrial	Boat Building	336612	96	26	(395,368)	42,898	400,066	15,387
Industrial	Military Armored Vehicle, Tank, and Tank Component Manufacturing	336992	2	2	-	-	47,596	23,798
Industrial	Wood Kitchen Cabinet and Countertop Manufacturing	337110	347	233	(2,030,654)	338,496	2,055,760	8,823
Industrial	Upholstered Household Furniture Manufacturing	337121	2	2	-	-	47,596	23,798
Industrial	Nonupholstered Wood Household Furniture Manufacturing	337122	14	9	-	-	363,601	40,400
Industrial	Institutional Furniture Manufacturing	337127	1	1	-	-	15,247	15,247
Industrial	Wood Office Furniture Manufacturing	337211	5	4	-	-	253,162	63,290
Industrial	Office Furniture (except Wood) Manufacturing	337214	19	12	(276,288)	7,473	316,411	26,368
Industrial	Showcase, Partition, Shelving, and Locker Manufacturing	337215	1	1	-	-	15,247	15,247
Industrial	Blind and Shade Manufacturing	337920	1	1	-	-	15,247	15,247
Industrial	Surgical and Medical Instrument Manufacturing	339112	2	0	-	-	-	-
Industrial	Surgical Appliance and Supplies Manufacturing	339113	1	0	-	-	-	-
Industrial	Jewelry and Silverware Manufacturing	339910	1	0	-	-	-	-
Industrial	Sporting and Athletic Goods Manufacturing	339920	1	0	-	-	-	-

(continued)

Table 3-4. Year 5 Avoided Cost for Sources under the PRIMARY SCENARIO (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Year 5 (\$/Year)		Cost (\$)	
			Number of Facilities Subject to MACT	Number of Facilities Under the Primary Scenario	Estimated Costs (Savings)	Estimated Cost of Area Source Requirements	Avoided Costs Year 5	Average Avoided Cost/Entity (2017)
Industrial	Office Supplies (except Paper) Manufacturing	339940	1	0	-	-	-	-
Industrial	Gasket, Packing, and Sealing Device Manufacturing	339991	2	0	-	-	-	-
Industrial	Burial Casket Manufacturing	339995	3	1	-	-	15,247	15,247
Industrial	All Other Miscellaneous Manufacturing	339999	5	2	-	-	47,596	23,798
Commercial	Grain and Field Bean Merchant Wholesalers	424510	1	0	-	-	-	-
Commercial	Petroleum Bulk Stations and Terminals	424710	7	3	-	-	62,843	20,948
Commercial	Scheduled Passenger Air Transportation	481111	2	0	-	-	-	-
Commercial	Line-Haul Railroads	482111	1	0	-	-	-	-
Energy	Pipeline Transportation of Crude Oil	486110	1	0	-	-	-	-
Energy	Pipeline Transportation of Natural Gas	486210	257	103	(183,600)	58,985	2,988,291	29,013
Energy	Pipeline Transportation of Refined Petroleum Products	486910	1	0	-	-	-	-
Commercial	Support Activities for Rail Transportation	488210	3	1	-	-	15,247	15,247
Commercial	Marine Cargo Handling	488320	2	0	-	-	-	-
Commercial	General Warehousing and Storage	493110	180	57	(1,837,450)	423,355	1,414,096	24,809
Commercial	Other Warehousing and Storage	493190	6	2	-	-	47,596	23,798
Commercial	Lessors of Nonresidential Buildings (except Miniwarehouses)	531120	1	0	-	-	-	-
Commercial	Testing Laboratories	541380	2	0	-	-	-	-
Commercial	Research and Development in the Physical, Engineering and Life Sciences (except Nanotechnology and Biotechnology)^^	541715	2	0	-	-	-	-
Commercial	All Other Support Services	561990	1	0	-	-	-	-
Waste Treatment	Hazardous Waste Treatment and Disposal	562211	41	23	(2,012,789)	37,536	2,022,849	87,950
Waste Treatment	Solid Waste Landfill	562212	6	4	-	-	253,162	63,290
Waste Treatment	Solid Waste Combustors and Incinerators	562213	3	2	-	-	47,596	23,798
Waste Treatment	Remediation Services	562910	1	1	-	-	15,247	15,247
Educational Services	Colleges, Universities, and Professional Schools	611310	23	9	-	-	363,601	40,400
Commercial	Amusement and Theme Parks	713110	1	0	-	-	-	-
Commercial	Linen and Uniform Supply	812330	1	0	-	-	-	-
Commercial	Industrial Launderers	812332	3	1	-	-	15,247	15,247

Notes:

Six source categories from the assessed categories were identified that would not be affected by the change in policy: Decorative Chromium Electroplating, Hard Chromium Electroplating, Other Chromium Electroplating, Secondary Lead, Wool Fiberglass, and Portland Cement.

Out of these six categories, four area source categories are subject to a MACT standard where area sources in these categories are subject to the same HAP requirement for major sources in these categories: Decorative Chromium Electroplating, Hard Chromium Electroplating, Other Chromium Electroplating, and Portland Cement. Because there are no differences in the requirements between major and area sources for these categories, there is no impact of the MM2A policy change on these categories, and they were excluded from the table.

For Table 3-4, two columns—estimated Cost Savings and Estimated Cost of Area Source Requirements—are incomplete because for the cost categories without completed RTR modeling files, we only have the extrapolated cost or savings for facilities in year 5 (2025 and beyond) and not a breakdown of those cost savings by area source requirement costs or supporting statement cost savings. We have included all of the cost information that is currently available.

The blank cells in the “Average Avoided Cost/Entity” column represent source categories for which there are zero facilities eligible to obtain area source status.

NAICS 922140 (Correctional Institutions), NAICS 927110 (Space Research and Technology), NAICS 928110 (National Security) are government/public administration NAICS codes not covered by the Census. Hence, we have not included them in this table.

NAICS 999999 is an unclassified code and are not included in this table.

Note: The total number of facilities estimated to obtain area source status in this table is less than the sum in Table 1-1 because our analysis excludes Public Administration (NAICS 922140, 927110, and 928110) and Unclassified NAICS Code (999999) because the Census does not report data for these NAICS codes.

Sources: 2012 Economic Census; Eastern Research Group. August 2020a. ERG MM2A Database Memorandum, Analytical Evaluations & Summary of Industries Potentially Impacted by the Final Rule “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD; Eastern Research Group. August 2020b. ERG Mm2A Cost Analysis Memorandum, Compliance cost savings analysis for the final rulemaking “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD.

NAICS 2012 and NAICS 2007 (<https://www.census.gov/eos/www/naics/downloadables/downloadables.html>).

Table 3-5. Year 5 Avoided Cost for Sources under ALTERNATIVE SCENARIO 1 (2017\$)

Sector	NAICS Descriptions	NAICS	Facilities		Year 5 (\$/Year)		Cost (\$)	
			Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 1	Estimated Costs (Savings)	Estimated Cost of Area Source Requirements	Avoided Costs Year 5	Average Avoided Cost/Entity
Agriculture	Postharvest Crop Activities (except Cotton Ginning)	115114	1	0	-	-	-	-
Energy	Crude Petroleum and Natural Gas Extraction	211111	120	40	(223,759)	62,560	446,711	11,168
Energy	Natural Gas Liquid Extraction	211112	26	9	-	-	363,601	40,400
Industrial	Iron Ore Mining	212210	11	0	-	-	-	-
Industrial	Lead Ore and Zinc Ore Mining	212231	1	0	-	-	-	-
Industrial	Copper Ore and Nickel Ore Mining	212234	1	0	-	-	-	-
Industrial	All Other Metal Ore Mining	212299	1	0	-	-	-	-
Industrial	Industrial Sand Mining	212322	3	0	-	-	-	-
Industrial	Kaolin and Ball Clay Mining	212324	3	0	-	-	-	-
Industrial	Potash, Soda, and Borate Mineral Mining	212391	6	0	-	-	-	-
Industrial	All Other Nonmetallic Mineral Mining	212399	1	0	-	-	-	-
Energy	Support Activities for Oil and Gas Operations	213112	3	1	-	-	15,247	15,247
Utilities	Hydroelectric Power Generation	221111	1	1	-	-	15,247	15,247
Utilities	Fossil Fuel Electric Power Generation	221112	334	85	-	-	3,528,036	41,506
Utilities	Biomass Electric Power Generation	221117	5	4	-	-	253,162	63,290
Utilities	Other Electric Power Generation	221118	1	1	-	-	15,247	15,247
Utilities	Other Electric Power Generation^	221119	8	5	-	-	285,511	57,102
Utilities	Electric Power Distribution	221122	1	1	-	-	15,247	15,247
Utilities	Natural Gas Distribution	221210	13	7	-	-	316,005	45,144
Utilities	Water Supply and Irrigation Systems	221310	2	2	-	-	47,596	23,798
Utilities	Sewage Treatment Facilities	221320	17	10	(158)	162	253,158	25,316
Utilities	Steam and Air-Conditioning Supply	221330	22	13	-	-	442,922	34,071
Industrial	Other Animal Food Manufacturing	311119	1	0	-	-	-	-
Industrial	Wet Corn Milling	311221	16	0	-	-	-	-
Industrial	Soybean Processing^	311222	16	0	-	-	-	-
Industrial	Other Oilseed Processing^	311223	5	0	-	-	-	-
Industrial	Soybean and Other Oilseed Processing	311224	116	1	(37,074)	1,787	35,287	35,287
Industrial	Fats and Oils Refining and Blending	311225	2	0	-	-	-	-
Industrial	Beet Sugar Manufacturing	311313	11	0	-	-	-	-
Industrial	Cane Sugar Manufacturing	311314	3	0	-	-	-	-
Industrial	Frozen Fruit, Juice, and Vegetable Manufacturing	311411	2	0	-	-	-	-
Industrial	Fruit and Vegetable Canning	311421	1	0	-	-	-	-
Industrial	Specialty Canning	311422	2	0	-	-	-	-
Industrial	Cheese Manufacturing	311513	2	0	-	-	-	-
Industrial	Dry, Condensed, and Evaporated Dairy Product Manufacturing	311514	3	0	-	-	-	-
Industrial	Rendering and Meat Byproduct Processing	311613	1	0	-	-	-	-
Industrial	Commercial Bakeries	311812	2	0	-	-	-	-
Industrial	Other Snack Food Manufacturing	311919	1	0	-	-	-	-
Industrial	Coffee and Tea Manufacturing	311920	1	0	-	-	-	-
Industrial	Flavoring Syrup and Concentrate Manufacturing	311930	1	0	-	-	-	-
Industrial	Spice and Extract Manufacturing	311942	4	0	-	-	-	-

(continued)

Table 3-5. Year 5 Avoided Cost for Sources under ALTERNATIVE SCENARIO 1 (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Year 5 (\$/Year)		Cost (\$)	
			Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 1	Estimated Costs (Savings)	Estimated Cost of Area Source Requirements	Avoided Costs Year 5	Average Avoided Cost/Entity
Industrial	All Other Miscellaneous Food Manufacturing	311999	6	0	-	-	-	
Industrial	Breweries	312120	3	1	-	-	15,247	15,247
Industrial	Distilleries	312140	1	0	-	-	-	
Industrial	Tobacco Manufacturing	312230	1	0	-	-	-	
Industrial	Yarn Spinning Mills^	313111	1	1	-	-	15,247	15,247
Industrial	Thread Mills^	313113	1	1	-	-	15,247	15,247
Industrial	Broadwoven Fabric Mills	313210	2	2	-	-	47,596	23,798
Industrial	Narrow Fabric Mills^	313221	1	1	-	-	15,247	15,247
Industrial	Textile and Fabric Finishing Mills	313310	1	1	-	-	15,247	15,247
Industrial	Broadwoven Fabric Finishing Mills^	313311	3	2	-	-	47,596	23,798
Industrial	Fabric Coating Mills	313320	50	26	(300,087)	16,441	536,808	20,646
Industrial	Tire Cord and Tire Fabric Mills^	314992	1	0	-	-	-	
Industrial	Leather and Hide Tanning and Finishing	316110	6	4	(6,375)	1,495	52,477	13,119
Industrial	Sawmills	321113	61	8	-	-	348,354	43,544
Industrial	Wood Preservation	321114	3	0	-	-	-	
Industrial	Hardwood Veneer and Plywood Manufacturing	321211	3	0	-	-	-	
Industrial	Softwood Veneer and Plywood Manufacturing	321212	29	3	-	-	62,843	20,948
Industrial	Engineered Wood Member (except Truss) Manufacturing	321213	6	0	-	-	-	
Industrial	Reconstituted Wood Product Manufacturing	321219	315	44	(891,659)	42,667	1,134,503	25,784
Industrial	Wood Window and Door Manufacturing	321911	4	0	-	-	-	
Industrial	Cut Stock, Resawing Lumber, and Planing	321912	4	0	-	-	-	
Industrial	All Other Miscellaneous Wood Product Manufacturing	321999	3	0	-	-	-	
Industrial	Pulp Mills	322110	18	3	-	-	62,843	20,948
Industrial	Paper (except Newsprint) Mills	322121	282	28	-	-	363,601	12,986
Industrial	Newsprint Mills	322122	7	1	-	-	15,247	15,247
Industrial	Paperboard Mills	322130	36	6	-	-	300,758	50,126
Industrial	Corrugated and Solid Fiber Box Manufacturing	322211	174	46	(78,453)	34,376	44,077	958
Industrial	Paper Bag and Coated and Treated Paper Manufacturing	322220	17	2	-	-	47,596	23,798
Industrial	Coated and Laminated Paper Manufacturing^	322222	12	2	-	-	47,596	23,798
Industrial	Sanitary Paper Product Manufacturing	322291	2	0	-	-	-	
Industrial	All Other Converted Paper Product Manufacturing	322299	1	0	-	-	-	
Industrial	Commercial Lithographic Printing^	323110	1	1	-	-	15,247	15,247
Industrial	Commercial Printing (except Screen and Books)	323111	188	99	(1,718,671)	68,005	1,999,020	20,192
Industrial	Books Printing	323117	3	2	-	-	47,596	23,798
Industrial	Petroleum Refineries	324110	430	65	(2,577,684)	47,297	6,329,839	97,382
Industrial	Asphalt Shingle and Coating Materials Manufacturing	324122	3	0	-	-	-	
Industrial	All Other Petroleum and Coal Products Manufacturing	324199	4	0	-	-	-	
Industrial	Petrochemical Manufacturing	325110	597	190	(342,065)	169,420	3,036,605	15,982
Industrial	Industrial Gas Manufacturing	325120	4	1	-	-	15,247	15,247
Industrial	Synthetic Dye and Pigment Manufacturing	325130	1	0	-	-	-	

(continued)

Table 3-5. Year 5 Avoided Cost for Sources under ALTERNATIVE SCENARIO 1 (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Year 5 (\$/Year)		Cost (\$)	
			Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 1	Estimated Costs (Savings)	Estimated Cost of Area Source Requirements	Avoided Costs Year 5	Average Avoided Cost/Entity
Industrial	Inorganic Dye and Pigment Manufacturing^	325131	3	1	-	-	15,247	15,247
Industrial	Synthetic Organic Dye and Pigment Manufacturing^	325132	2	0	-	-	-	-
Industrial	Other Basic Inorganic Chemical Manufacturing	325180	10	2	-	-	47,596	23,798
Industrial	Alkalies and Chlorine Manufacturing^	325181	4	1	-	-	22,921	22,921
Industrial	Carbon Black Manufacturing^	325182	21	6	-	-	170,385	28,397
Industrial	All Other Basic Inorganic Chemical Manufacturing^	325188	93	24	-	-	676,787	28,199
Industrial	Cyclic Crude and Intermediate Manufacturing^	325192	1	0	-	-	-	-
Industrial	Ethyl Alcohol Manufacturing	325193	7	2	-	-	47,596	23,798
Industrial	Cyclic Crude, Intermediate, and Gum and Wood Chemical Manufacturing	325194	2	0	-	-	-	-
Industrial	All Other Basic Organic Chemical Manufacturing	325199	77	20	(530,241)	8,745	1,202,333	60,117
Industrial	Plastics Material and Resin Manufacturing	325211	857	197	(6,207,078)	336,475	6,534,541	33,170
Industrial	Synthetic Rubber Manufacturing	325212	22	2	(900)	2,186	13,961	6,981
Industrial	Artificial and Synthetic Fibers and Filaments Manufacturing	325220	6	2	-	-	47,596	23,798
Industrial	Cellulosic Organic Fiber Manufacturing^	325221	1	0	-	-	-	-
Industrial	Noncellulosic Organic Fiber Manufacturing^	325222	8	2	-	-	53,618	26,809
Industrial	Nitrogenous Fertilizer Manufacturing	325311	16	4	-	-	253,162	63,290
Industrial	Phosphatic Fertilizer Manufacturing	325312	30	2	-	-	47,596	23,798
Industrial	Pesticide and Other Agricultural Chemical Manufacturing	325320	22	3	(146,667)	4,372	157,541	52,514
Industrial	Medicinal and Botanical Manufacturing	325411	4	1	-	-	15,247	15,247
Industrial	Pharmaceutical Preparation Manufacturing	325412	36	4	(5,511)	4,372	48,735	12,184
Industrial	Biological Product (except Diagnostic) Manufacturing	325414	1	0	-	-	-	-
Industrial	Paint and Coating Manufacturing	325510	48	18	(2,299,334)	34,978	2,311,952	128,442
Industrial	Adhesive Manufacturing	325520	4	1	-	-	15,247	15,247
Industrial	Surface Active Agent Manufacturing	325613	2	0	-	-	-	-
Industrial	Toilet Preparation Manufacturing	325620	2	0	-	-	-	-
Industrial	Explosives Manufacturing	325920	2	0	-	-	-	-
Industrial	Custom Compounding of Purchased Resins	325991	5	2	-	-	47,596	23,798
Industrial	Photographic Film, Paper, Plate, and Chemical Manufacturing	325992	4	1	-	-	15,247	15,247
Industrial	All Other Miscellaneous Chemical Product and Preparation Manufacturing	325998	10	2	-	-	47,596	23,798
Industrial	Plastics Packaging Film and Sheet (including Laminated) Manufacturing	326112	5	2	-	-	47,596	23,798
Industrial	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing	326113	16	6	-	-	300,758	50,126
Industrial	Unlaminated Plastics Profile Shape Manufacturing	326121	12	0	-	-	-	-
Industrial	Plastics Pipe and Pipe Fitting Manufacturing	326122	1	0	-	-	-	-
Industrial	Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing	326130	7	2	-	-	47,596	23,798

(continued)

Table 3-5. Year 5 Avoided Cost for Sources under ALTERNATIVE SCENARIO 1 (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Year 5 (\$/Year)		Cost (\$)	
			Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 1	Estimated Costs (Savings)	Estimated Cost of Area Source Requirements	Avoided Costs Year 5	Average Avoided Cost/Entity
Industrial	Polystyrene Foam Product Manufacturing	326140	1	0	-	-	-	-
Industrial	Urethane and Other Foam Product (except Polystyrene) Manufacturing	326150	19	13	(84,386)	5,639	139,439	10,726
Industrial	Plastics Plumbing Fixture Manufacturing	326191	2	0	-	-	-	-
Industrial	All Other Plastics Product Manufacturing	326199	148	46	(1,636,894)	28,398	1,956,851	42,540
Industrial	Tire Manufacturing (except Retreading)	326211	39	14	-	-	570,912	40,779
Industrial	Rubber and Plastics Hoses and Belting Manufacturing	326220	6	2	-	-	47,596	23,798
Industrial	Rubber Product Manufacturing for Mechanical Use	326291	2	0	-	-	-	-
Industrial	All Other Rubber Product Manufacturing	326299	14	3	-	-	62,843	20,948
Industrial	Pottery, Ceramics, and Plumbing Fixture Manufacturing	327110	4	1	-	-	16,425	16,425
Industrial	Clay Building Material and Refractories Manufacturing	327120	76	41	(687,934)	73,284	614,649	14,991
Industrial	Clay Refractory Manufacturing^	327124	8	3	-	-	43,800	14,600
Industrial	Flat Glass Manufacturing	327211	2	0	-	-	-	-
Industrial	Other Pressed and Blown Glass and Glassware Manufacturing	327212	17	5	(27,286)	3,575	86,554	17,311
Industrial	Cement Manufacturing	327310	6	2	-	-	47,596	23,798
Industrial	Lime Manufacturing	327410	38	1	-	-	15,247	15,247
Industrial	Gypsum Product Manufacturing	327420	1	0	-	-	-	-
Industrial	Abrasive Product Manufacturing	327910	4	1	-	-	15,247	15,247
Industrial	Mineral Wool Manufacturing	327993	13	3	(36,852)	1,787	82,661	27,554
Industrial	All Other Miscellaneous Nonmetallic Mineral Product Manufacturing	327999	2	0	-	-	-	-
Industrial	Iron and Steel Mills and Ferroalloy Manufacturing	331110	73	37	(1,308,620)	62,560	1,293,657	34,964
Industrial	Iron and Steel Mills^	331111	50	2	-	-	47,596	23,798
Industrial	Electrometallurgical Ferroalloy Product Manufacturing^	331112	1	0	-	-	-	-
Industrial	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel	331210	5	1	-	-	15,247	15,247
Industrial	Rolled Steel Shape Manufacturing	331221	6	1	-	-	15,247	15,247
Industrial	Primary Aluminum Production^	331312	2	0	-	-	-	-
Industrial	Alumina Refining and Primary Aluminum Production	331313	16	0	-	-	-	-
Industrial	Secondary Smelting and Alloying of Aluminum	331314	56	5	(42,747)	27,813	14,934	2,987
Industrial	Aluminum Sheet, Plate, and Foil Manufacturing	331315	6	1	-	-	15,247	15,247
Industrial	Aluminum Extruded Product Manufacturing^	331316	1	0	-	-	-	-
Industrial	Other Aluminum Rolling, Drawing, and Extruding	331318	2	0	-	-	-	-
Industrial	Nonferrous Metal (except Aluminum) Smelting and Refining	331410	1	0	-	-	-	-
Industrial	Primary Smelting and Refining of Copper^	331411	0	0	-	-	-	-
Industrial	Primary Smelting and Refining of Nonferrous Metal (except Copper and Aluminum)^	331419	2	0	-	-	-	-
Industrial	Copper Rolling, Drawing, Extruding, and Alloying	331420	3	0	-	-	-	-

(continued)

Table 3-5. Year 5 Avoided Cost for Sources under ALTERNATIVE SCENARIO 1 (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Year 5 (\$/Year)		Cost (\$)	
			Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 1	Estimated Costs (Savings)	Estimated Cost of Area Source Requirements	Avoided Costs Year 5	Average Avoided Cost/Entity
Industrial	Copper Wire (except Mechanical) Drawing^	331422	1	0	-	-	-	
Industrial	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, and Extruding	331491	3	0	-	-	-	
Industrial	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	331492	2	0	-	-	-	
Industrial	Iron Foundries	331511	59	3	-	-	62,843	20,948
Industrial	Steel Foundries (except Investment)	331513	2	0	-	-	-	
Industrial	Aluminum Die-Casting Foundries^	331521	1	0	-	-	-	
Industrial	Aluminum Foundries (except Die-Casting)	331524	2	0	-	-	-	
Industrial	Nonferrous Forging	332112	1	1	-	-	15,247	15,247
Industrial	Metal Crown, Closure, and Other Metal Stamping (except Automotive)	332119	1	1	-	-	15,247	15,247
Industrial	Hand and Edge Tool Manufacturing^	332212	1	1	-	-	15,247	15,247
Industrial	Prefabricated Metal Building and Component Manufacturing	332311	1	1	-	-	15,247	15,247
Industrial	Fabricated Structural Metal Manufacturing	332312	1	1	-	-	15,247	15,247
Industrial	Metal Window and Door Manufacturing	332321	5	4	-	-	253,162	63,290
Industrial	Sheet Metal Work Manufacturing	332322	1	1	-	-	15,247	15,247
Industrial	Metal Can Manufacturing	332431	14	8	(82,351)	1,495	381,614	47,702
Industrial	Other Metal Container Manufacturing	332439	4	2	-	-	47,596	23,798
Industrial	Bolt, Nut, Screw, Rivet, and Washer Manufacturing	332722	1	1	-	-	15,247	15,247
Industrial	Metal Heat Treating	332811	1	1	-	-	15,247	15,247
Industrial	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers	332812	433	241	(11,349,410)	172,629	11,556,860	47,954
Industrial	Electroplating, Plating, Polishing, Anodizing, and Coloring	332813	3	2	-	-	47,596	23,798
Industrial	Other Fabricated Metal Manufacturing	332990	1	1	-	-	15,247	15,247
Industrial	Small Arms Ammunition Manufacturing	332992	1	1	-	-	15,247	15,247
Industrial	Ammunition (except Small Arms) Manufacturing	332993	3	2	-	-	47,596	23,798
Industrial	All Other Miscellaneous Fabricated Metal Product Manufacturing	332999	3	2	-	-	47,596	23,798
Industrial	Farm Machinery and Equipment Manufacturing	333111	8	3	-	-	62,843	20,948
Industrial	Lawn and Garden Tractor and Home Lawn and Garden Equipment Manufacturing	333112	1	0	-	-	-	
Industrial	Construction Machinery Manufacturing	333120	64	27	(335,575)	44,686	338,486	12,537
Industrial	Mining Machinery and Equipment Manufacturing	333131	2	0	-	-	-	
Industrial	Printing Machinery and Equipment Manufacturing^	333293	1	0	-	-	-	
Industrial	Photographic and Photocopying Equipment Manufacturing	333316	1	0	-	-	-	
Industrial	Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing	333415	1	0	-	-	-	

(continued)

Table 3-5. Year 5 Avoided Cost for Sources under ALTERNATIVE SCENARIO 1 (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Year 5 (\$/Year)		Cost (\$)	
			Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 1	Estimated Costs (Savings)	Estimated Cost of Area Source Requirements	Avoided Costs Year 5	Average Avoided Cost/Entity
Industrial	Machine Tool (Metal Cutting Types) Manufacturing^	333512	1	0	-	-	-	
Industrial	Machine Tool (Metal Forming Types) Manufacturing^	333513	1	0	-	-	-	
Industrial	Turbine and Turbine Generator Set Units Manufacturing	333611	1	0	-	-	-	
Industrial	Other Engine Equipment Manufacturing	333618	5	2	-	-	47,596	23,798
Industrial	Overhead Traveling Crane, Hoist, and Monorail System Manufacturing	333923	1	0	-	-	-	
Industrial	Welding and Soldering Equipment Manufacturing	333992	2	0	-	-	-	
Industrial	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	334220	1	0	-	-	-	
Industrial	Electron Tube Manufacturing^	334411	1	0	-	-	-	
Industrial	Bare Printed Circuit Board Manufacturing	334412	1	0	-	-	-	
Industrial	Semiconductor and Related Device Manufacturing	334413	23	11	-	-	434,977	39,543
Industrial	Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use	334512	1	0	-	-	-	
Industrial	Blank Magnetic and Optical Recording Media Manufacturing	334613	0	0	-	-	-	
Industrial	Electric Lamp Bulb and Part Manufacturing	335110	1	1	-	-	15,247	15,247
Industrial	Household Laundry Equipment Manufacturing	335224	13	8	(248,350)	4,484	291,462	36,433
Industrial	Other Major Household Appliance Manufacturing	335228	2	2	-	-	47,596	23,798
Industrial	Power, Distribution, and Specialty Transformer Manufacturing	335311	1	1	-	-	15,247	15,247
Industrial	Motor and Generator Manufacturing	335312	2	2	-	-	47,596	23,798
Industrial	Storage Battery Manufacturing	335911	1	1	-	-	15,247	15,247
Industrial	Current-Carrying Wiring Device Manufacturing	335931	1	1	-	-	15,247	15,247
Industrial	Noncurrent-Carrying Wiring Device Manufacturing	335932	1	1	-	-	15,247	15,247
Industrial	Carbon and Graphite Product Manufacturing	335991	6	4	-	-	253,162	63,290
Industrial	Automobile Manufacturing	336111	66	10	(87,102)	1,495	433,962	43,396
Industrial	Light Truck and Utility Vehicle Manufacturing	336112	5	2	-	-	47,596	23,798
Industrial	Heavy Duty Truck Manufacturing	336120	8	2	-	-	47,596	23,798
Industrial	Motor Vehicle Body Manufacturing	336211	8	2	-	-	47,596	23,798
Industrial	Truck Trailer Manufacturing	336212	1	0	-	-	-	
Industrial	Motor Vehicle Gasoline Engine and Engine Parts Manufacturing	336310	2	0	-	-	-	
Industrial	Carburetor, Piston, Piston Ring, and Valve Manufacturing^	336311	1	0	-	-	-	
Industrial	Gasoline Engine and Engine Parts Manufacturing^	336312	3	1	-	-	15,247	15,247
Industrial	Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing	336330	2	0	-	-	-	
Industrial	Motor Vehicle Brake System Manufacturing	336340	1	0	-	-	-	
Industrial	Motor Vehicle Transmission and Power Train Parts Manufacturing	336350	2	0	-	-	-	

(continued)

Table 3-5. Year 5 Avoided Cost for Sources under ALTERNATIVE SCENARIO 1 (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Year 5 (\$/Year)		Cost (\$)	
			Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 1	Estimated Costs (Savings)	Estimated Cost of Area Source Requirements	Avoided Costs Year 5	Average Avoided Cost/Entity
Industrial	Motor Vehicle Seating and Interior Trim Manufacturing	336360	1	0	-	-	-	
Industrial	Motor Vehicle Metal Stamping	336370	1	0	-	-	-	
Industrial	Other Motor Vehicle Parts Manufacturing	336390	13	3	-	-	62,843	20,948
Industrial	All Other Motor Vehicle Parts Manufacturing^	336399	2	0	-	-	-	
Industrial	Aircraft Manufacturing	336411	125	89	(9,493,208)	62,027	9,731,939	109,348
Industrial	Aircraft Engine and Engine Parts Manufacturing	336412	8	2	-	-	47,596	23,798
Industrial	Other Aircraft Parts and Auxiliary Equipment Manufacturing	336413	10	3	-	-	62,843	20,948
Industrial	Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing	336415	1	0	-	-	-	
Industrial	Railroad Rolling Stock Manufacturing	336510	1	0	-	-	-	
Industrial	Ship Building and Repairing	336611	92	18	(860,000)	11,957	895,639	49,758
Industrial	Boat Building	336612	96	16	(247,105)	26,811	235,541	14,721
Industrial	Military Armored Vehicle, Tank, and Tank Component Manufacturing	336992	2	0	-	-	-	
Industrial	Wood Kitchen Cabinet and Countertop Manufacturing	337110	347	209	(1,822,150)	303,740	1,866,764	8,932
Industrial	Upholstered Household Furniture Manufacturing	337121	2	2	-	-	47,596	23,798
Industrial	Nonupholstered Wood Household Furniture Manufacturing	337122	14	8	-	-	348,354	43,544
Industrial	Institutional Furniture Manufacturing	337127	1	1	-	-	15,247	15,247
Industrial	Wood Office Furniture Manufacturing	337211	5	4	-	-	253,162	63,290
Industrial	Office Furniture (except Wood) Manufacturing	337214	19	11	(248,659)	6,726	289,530	26,321
Industrial	Showcase, Partition, Shelving, and Locker Manufacturing	337215	1	1	-	-	15,247	15,247
Industrial	Blind and Shade Manufacturing	337920	1	1	-	-	15,247	15,247
Industrial	Surgical and Medical Instrument Manufacturing	339112	2	0	-	-	-	
Industrial	Surgical Appliance and Supplies Manufacturing	339113	1	0	-	-	-	
Industrial	Jewelry and Silverware Manufacturing	339910	1	0	-	-	-	
Industrial	Sporting and Athletic Goods Manufacturing	339920	1	0	-	-	-	
Industrial	Office Supplies (except Paper) Manufacturing	339940	1	0	-	-	-	
Industrial	Gasket, Packing, and Sealing Device Manufacturing	339991	2	0	-	-	-	
Industrial	Burial Casket Manufacturing	339995	3	1	-	-	15,247	15,247
Industrial	All Other Miscellaneous Manufacturing	339999	5	2	-	-	47,596	23,798
Commercial	Grain and Field Bean Merchant Wholesalers	424510	1	0	-	-	-	
Commercial	Petroleum Bulk Stations and Terminals	424710	7	2	-	-	47,596	23,798
Commercial	Scheduled Passenger Air Transportation	481111	2	0	-	-	-	
Commercial	Line-Haul Railroads	482111	1	0	-	-	-	
Energy	Pipeline Transportation of Crude Oil	486110	1	0	-	-	-	
Energy	Pipeline Transportation of Natural Gas	486210	257	84	(150,218)	48,260	2,348,871	27,963
Energy	Pipeline Transportation of Refined Petroleum Products	486910	1	0	-	-	-	
Commercial	Support Activities for Rail Transportation	488210	3	1	-	-	15,247	15,247
Commercial	Marine Cargo Handling	488320	2	0	-	-	-	

(continued)

Table 3-5. Year 5 Avoided Cost for Sources under ALTERNATIVE SCENARIO 1 (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Year 5 (\$/Year)		Cost (\$)	
			Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 1	Estimated Costs (Savings)	Estimated Cost of Area Source Requirements	Avoided Costs Year 5	Average Avoided Cost/Entity
Commercial	General Warehousing and Storage	493110	180	53	(1,708,506)	393,645	1,314,861	24,809
Commercial	Other Warehousing and Storage	493190	6	2	-	-	47,596	23,798
Commercial	Lessors of Nonresidential Buildings (except Miniwarehouses)	531120	1	0	-	-	-	-
Commercial	Testing Laboratories	541380	2	0	-	-	-	-
Commercial	Research and Development in the Physical, Engineering and Life Sciences (except Nanotechnology and Biotechnology)^^	541715	2	0	-	-	-	-
Commercial	All Other Support Services	561990	1	0	-	-	-	-
Waste Treatment	Hazardous Waste Treatment and Disposal	562211	41	18	(1,629,400)	30,386	1,614,261	89,681
Waste Treatment	Solid Waste Landfill	562212	6	2	-	-	47,596	23,798
Waste Treatment	Solid Waste Combustors and Incinerators	562213	3	1	-	-	15,247	15,247
Waste Treatment	Remediation Services	562910	1	0	-	-	-	-
Educational Services	Colleges, Universities, and Professional Schools	611310	23	8	-	-	348,354	43,544
Commercial	Amusement and Theme Parks	713110	1	0	-	-	-	-
Commercial	Linen and Uniform Supply	812330	1	0	-	-	-	-
Commercial	Industrial Launderers	812332	3	1	-	-	15,247	15,247

Notes:

Six source categories from the assessed categories were identified that would not be affected by the change in policy: Decorative Chromium Electroplating, Hard Chromium Electroplating, Other Chromium Electroplating, Secondary Lead, Wool Fiberglass, and Portland Cement.

Out of these six categories, four area source categories are subject to a MACT standard where area sources in these categories are subject to the same HAP requirement for major sources in these categories: Decorative Chromium Electroplating, Hard Chromium Electroplating, Other Chromium Electroplating and Portland Cement. Because there are no differences in the requirements between major and area sources for these categories, there is no impact of the MM2A policy change on these categories and they were excluded from the table.

For Table 3-5, two columns—Estimated Costs Savings and Estimated Cost of Area Source Requirements—are incomplete because for the cost categories without completed RTR modeling files, we only have the extrapolated cost or savings for facilities in year 5 (2025 and beyond) and not a breakdown of those cost savings by area source requirement costs or supporting statement cost savings. We have included all of the cost information that is currently available.

The blank cells in the “Average Avoided Cost/Entity” column represent source categories for which there are zero facilities eligible to obtain area source status.

NAICS 922140 (Correctional Institutions), NAICS 927110 (Space Research and Technology), NAICS 928110 (National Security) are government/public administration NAICS codes not covered by the Census. Hence, we have not included them in this table.

NAICS 999999 is an unclassified code and therefore, we have not included it in this table.

Note: The total number of facilities estimated to obtain area source status in this table is less than the sum in Table 1-2 because our analysis excludes Public Administration (NAICS 922140, 927110, and 928110) and Unclassified NAICS Code (999999) because the Census does not report data for these NAICS codes.

Sources: 2012 Economic Census; Eastern Research Group. August 2020a. ERG MM2A Database Memorandum, Analytical Evaluations & Summary of Industries Potentially Impacted by the Final Rule “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD; Eastern Research Group. August 2020b. ERG MM2A Cost Analysis Memorandum, Compliance cost savings analysis for the final rulemaking “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD.

NAICS 2012 and NAICS 2007 (<https://www.census.gov/eos/www/naics/downloadables/downloadables.html>).

Table 3-6. Year 5 Avoided Cost for Sources under ALTERNATIVE SCENARIO 2 (2017\$)

Sector	NAICS Descriptions	NAICS	Facilities		Year 5 (\$/Year)		Cost (\$)	
			Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 2	Estimated Costs (Savings)	Estimated Cost of Area Source Requirements	Avoided Costs Year 5	Average Avoided Cost/Entity
Agriculture	Postharvest Crop Activities (except Cotton Ginning)	115114	1	0	-	-	-	-
Energy	Crude Petroleum and Natural Gas Extraction	211111	120	57	(326,049)	91,159	535,649	9,397
Energy	Natural Gas Liquid Extraction	211112	26	12	-	-	426,445	35,537
Industrial	Iron Ore Mining	212210	11	0	-	-	-	-
Industrial	Lead Ore and Zinc Ore Mining	212231	1	0	-	-	-	-
Industrial	Copper Ore and Nickel Ore Mining	212234	1	0	-	-	-	-
Industrial	All Other Metal Ore Mining	212299	1	0	-	-	-	-
Industrial	Industrial Sand Mining	212322	3	0	-	-	-	-
Industrial	Kaolin and Ball Clay Mining	212324	3	0	-	-	-	-
Industrial	Potash, Soda, and Borate Mineral Mining	212391	6	0	-	-	-	-
Industrial	All Other Nonmetallic Mineral Mining	212399	1	0	-	-	-	-
Energy	Support Activities for Oil and Gas Operations	213112	3	1	-	-	15,247	15,247
Utilities	Hydroelectric Power Generation	221111	1	1	-	-	15,247	15,247
Utilities	Fossil Fuel Electric Power Generation	221112	334	100	-	-	4,018,555	40,186
Utilities	Biomass Electric Power Generation	221117	5	4	-	-	253,162	63,290
Utilities	Other Electric Power Generation	221118	1	1	-	-	15,247	15,247
Utilities	Other Electric Power Generation^	221119	8	6	-	-	300,758	50,126
Utilities	Electric Power Distribution	221122	1	1	-	-	15,247	15,247
Utilities	Natural Gas Distribution	221210	13	9	-	-	363,601	40,400
Utilities	Water Supply and Irrigation Systems	221310	2	2	-	-	47,596	23,798
Utilities	Sewage Treatment Facilities	221320	17	12	(185)	189	268,404	22,367
Utilities	Steam and Air-Conditioning Supply	221330	22	15	-	-	490,519	32,701
Industrial	Other Animal Food Manufacturing	311119	1	0	-	-	-	-
Industrial	Wet Corn Milling	311221	16	0	-	-	-	-
Industrial	Soybean Processing^	311222	16	0	-	-	-	-
Industrial	Other Oilseed Processing^	311223	5	0	-	-	-	-
Industrial	Soybean and Other Oilseed Processing	311224	116	2	(74,149)	3,575	70,574	35,287
Industrial	Fats and Oils Refining and Blending	311225	2	0	-	-	-	-
Industrial	Beet Sugar Manufacturing	311313	11	0	-	-	-	-
Industrial	Cane Sugar Manufacturing	311314	3	0	-	-	-	-
Industrial	Frozen Fruit, Juice, and Vegetable Manufacturing	311411	2	0	-	-	-	-
Industrial	Fruit and Vegetable Canning	311421	1	0	-	-	-	-
Industrial	Specialty Canning	311422	2	0	-	-	-	-
Industrial	Cheese Manufacturing	311513	2	0	-	-	-	-
Industrial	Dry, Condensed, and Evaporated Dairy Product Manufacturing	311514	3	0	-	-	-	-
Industrial	Rendering and Meat Byproduct Processing	311613	1	0	-	-	-	-
Industrial	Commercial Bakeries	311812	2	0	-	-	-	-
Industrial	Other Snack Food Manufacturing	311919	1	0	-	-	-	-
Industrial	Coffee and Tea Manufacturing	311920	1	0	-	-	-	-
Industrial	Flavoring Syrup and Concentrate Manufacturing	311930	1	0	-	-	-	-

(continued)

Table 3-6. Year 5 Avoided Cost for Sources under ALTERNATIVE SCENARIO 2 (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Year 5 (\$/Year)		Cost (\$)	
			Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 2	Estimated Costs (Savings)	Estimated Cost of Area Source Requirements	Avoided Costs Year 5	Average Avoided Cost/Entity
Industrial	Spice and Extract Manufacturing	311942	4	0	-	-	-	-
Industrial	All Other Miscellaneous Food Manufacturing	311999	6	0	-	-	-	-
Industrial	Breweries	312120	3	1	-	-	15,247	15,247
Industrial	Distilleries	312140	1	0	-	-	-	-
Industrial	Tobacco Manufacturing	312230	1	0	-	-	-	-
Industrial	Yarn Spinning Mills^	313111	1	1	-	-	15,247	15,247
Industrial	Thread Mills^	313113	1	1	-	-	15,247	15,247
Industrial	Broadwoven Fabric Mills	313210	2	2	-	-	47,596	23,798
Industrial	Narrow Fabric Mills^	313221	1	1	-	-	15,247	15,247
Industrial	Textile and Fabric Finishing Mills	313310	1	1	-	-	15,247	15,247
Industrial	Broadwoven Fabric Finishing Mills^	313311	3	2	-	-	47,596	23,798
Industrial	Fabric Coating Mills	313320	50	32	(368,288)	20,177	616,520	19,266
Industrial	Tire Cord and Tire Fabric Mills^	314992	1	0	-	-	-	-
Industrial	Leather and Hide Tanning and Finishing	316110	6	5	(9,562)	2,242	54,917	10,983
Industrial	Sawmills	321113	61	25	-	-	1,044,439	41,778
Industrial	Wood Preservation	321114	3	1	-	-	15,247	15,247
Industrial	Hardwood Veneer and Plywood Manufacturing	321211	3	1	-	-	15,247	15,247
Industrial	Softwood Veneer and Plywood Manufacturing	321212	29	11	-	-	411,198	37,382
Industrial	Engineered Wood Member (except Truss) Manufacturing	321213	6	2	-	-	47,596	23,798
Industrial	Reconstituted Wood Product Manufacturing	321219	315	126	(2,276,363)	169,736	2,723,390	21,614
Industrial	Wood Window and Door Manufacturing	321911	4	1	-	-	15,247	15,247
Industrial	Cut Stock, Resawing Lumber, and Planing	321912	4	1	-	-	15,247	15,247
Industrial	All Other Miscellaneous Wood Product Manufacturing	321999	3	1	-	-	15,247	15,247
Industrial	Pulp Mills	322110	18	3	-	-	62,843	20,948
Industrial	Paper (except Newsprint) Mills	322121	282	43	(70,558)	1,787	542,812	12,624
Industrial	Newsprint Mills	322122	7	1	-	-	15,247	15,247
Industrial	Paperboard Mills	322130	36	9	-	-	363,601	40,400
Industrial	Corrugated and Solid Fiber Box Manufacturing	322211	174	68	(115,975)	50,817	65,158	958
Industrial	Paper Bag and Coated and Treated Paper Manufacturing	322220	17	3	-	-	62,843	20,948
Industrial	Coated and Laminated Paper Manufacturing^	322222	12	2	-	-	47,596	23,798
Industrial	Sanitary Paper Product Manufacturing	322291	2	0	-	-	-	-
Industrial	All Other Converted Paper Product Manufacturing	322299	1	0	-	-	-	-
Industrial	Commercial Lithographic Printing^	323110	1	1	-	-	15,247	15,247
Industrial	Commercial Printing (except Screen and Books)	323111	188	121	(2,115,287)	83,699	2,395,190	19,795
Industrial	Books Printing	323117	3	2	-	-	47,596	23,798
Industrial	Petroleum Refineries	324110	430	88	(3,441,264)	62,600	8,503,664	96,633
Industrial	Asphalt Shingle and Coating Materials Manufacturing	324122	3	0	-	-	-	-
Industrial	All Other Petroleum and Coal Products Manufacturing	324199	4	0	-	-	-	-
Industrial	Petrochemical Manufacturing	325110	597	260	(425,958)	198,816	5,241,203	20,158
Industrial	Industrial Gas Manufacturing	325120	4	1	-	-	15,247	15,247
Industrial	Synthetic Dye and Pigment Manufacturing	325130	1	0	-	-	-	-
Industrial	Inorganic Dye and Pigment Manufacturing^	325131	3	1	-	-	15,247	15,247

(continued)

Table 3-6. Year 5 Avoided Cost for Sources under ALTERNATIVE SCENARIO 2 (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Year 5 (\$/Year)		Cost (\$)	
			Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 2	Estimated Costs (Savings)	Estimated Cost of Area Source Requirements	Avoided Costs Year 5	Average Avoided Cost/Entity
Industrial	Synthetic Organic Dye and Pigment Manufacturing^	325132	2	0	-	-	-	
Industrial	Other Basic Inorganic Chemical Manufacturing	325180	10	3	-	-	62,843	20,948
Industrial	Alkalies and Chlorine Manufacturing^	325181	4	1	-	-	28,723	28,723
Industrial	Carbon Black Manufacturing^	325182	21	8	-	-	263,218	32,902
Industrial	All Other Basic Inorganic Chemical Manufacturing^	325188	93	37	-	-	1,188,548	32,123
Industrial	Cyclic Crude and Intermediate Manufacturing^	325192	1	0	-	-	-	
Industrial	Ethyl Alcohol Manufacturing	325193	7	3	-	-	62,843	20,948
Industrial	Cyclic Crude, Intermediate, and Gum and Wood Chemical Manufacturing	325194	2	0	-	-	-	
Industrial	All Other Basic Organic Chemical Manufacturing	325199	77	28	(662,801)	10,931	1,490,743	53,241
Industrial	Plastics Material and Resin Manufacturing	325211	857	341	(11,710,033)	590,729	11,964,486	35,086
Industrial	Synthetic Rubber Manufacturing	325212	22	2	(900)	2,186	13,961	6,981
Industrial	Artificial and Synthetic Fibers and Filaments Manufacturing	325220	6	2	-	-	47,596	23,798
Industrial	Cellulosic Organic Fiber Manufacturing^	325221	1	0	-	-	-	
Industrial	Noncellulosic Organic Fiber Manufacturing^	325222	8	3	-	-	82,629	27,543
Industrial	Nitrogenous Fertilizer Manufacturing	325311	16	6	-	-	300,758	50,126
Industrial	Phosphatic Fertilizer Manufacturing	325312	30	3	-	-	62,843	20,948
Industrial	Pesticide and Other Agricultural Chemical Manufacturing	325320	22	6	(366,667)	10,931	370,983	61,830
Industrial	Medicinal and Botanical Manufacturing	325411	4	1	-	-	15,247	15,247
Industrial	Pharmaceutical Preparation Manufacturing	325412	36	11	(22,044)	17,489	67,399	6,127
Industrial	Biological Product (except Diagnostic) Manufacturing	325414	1	0	-	-	-	
Industrial	Paint and Coating Manufacturing	325510	48	26	(3,449,001)	52,467	3,444,130	132,467
Industrial	Adhesive Manufacturing	325520	4	1	-	-	15,247	15,247
Industrial	Surface Active Agent Manufacturing	325613	2	0	-	-	-	
Industrial	Toilet Preparation Manufacturing	325620	2	0	-	-	-	
Industrial	Explosives Manufacturing	325920	2	0	-	-	-	
Industrial	Custom Compounding of Purchased Resins	325991	5	2	-	-	47,596	23,798
Industrial	Photographic Film, Paper, Plate, and Chemical Manufacturing	325992	4	1	-	-	15,247	15,247
Industrial	All Other Miscellaneous Chemical Product and Preparation Manufacturing	325998	10	3	-	-	62,843	20,948
Industrial	Plastics Packaging Film and Sheet (including Laminated) Manufacturing	326112	5	4	-	-	253,162	63,290
Industrial	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing	326113	16	8	-	-	348,354	43,544
Industrial	Unlaminated Plastics Profile Shape Manufacturing	326121	12	1	-	-	15,247	15,247
Industrial	Plastics Pipe and Pipe Fitting Manufacturing	326122	1	1	-	-	15,247	15,247
Industrial	Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing	326130	7	4	-	-	253,162	63,290
Industrial	Polystyrene Foam Product Manufacturing	326140	1	1	-	-	15,247	15,247

(continued)

Table 3-6. Year 5 Avoided Cost for Sources under ALTERNATIVE SCENARIO 2 (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Year 5 (\$/Year)		Cost (\$)	
			Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 2	Estimated Costs (Savings)	Estimated Cost of Area Source Requirements	Avoided Costs Year 5	Average Avoided Cost/Entity
Industrial	Urethane and Other Foam Product (except Polystyrene) Manufacturing	326150	19	16	(84,386)	5,639	231,191	14,449
Industrial	Plastics Plumbing Fixture Manufacturing	326191	2	2	-	-	47,596	23,798
Industrial	All Other Plastics Product Manufacturing	326199	148	81	(2,886,103)	50,070	3,469,275	42,831
Industrial	Tire Manufacturing (except Retreading)	326211	39	23	-	-	835,689	36,334
Industrial	Rubber and Plastics Hoses and Belting Manufacturing	326220	6	4	-	-	253,162	63,290
Industrial	Rubber Product Manufacturing for Mechanical Use	326291	2	2	-	-	47,596	23,798
Industrial	All Other Rubber Product Manufacturing	326299	14	6	-	-	300,758	50,126
Industrial	Pottery, Ceramics, and Plumbing Fixture Manufacturing	327110	4	3	-	-	38,514	12,838
Industrial	Clay Building Material and Refractories Manufacturing	327120	76	57	(922,838)	98,308	872,126	15,300
Industrial	Clay Refractory Manufacturing^	327124	8	4	-	-	62,045	15,511
Industrial	Flat Glass Manufacturing	327211	2	2	-	-	47,596	23,798
Industrial	Other Pressed and Blown Glass and Glassware Manufacturing	327212	17	11	(68,214)	8,937	360,035	32,730
Industrial	Cement Manufacturing	327310	6	4	-	-	253,162	63,290
Industrial	Lime Manufacturing	327410	38	2	-	-	47,596	23,798
Industrial	Gypsum Product Manufacturing	327420	1	1	-	-	15,247	15,247
Industrial	Abrasive Product Manufacturing	327910	4	2	-	-	47,596	23,798
Industrial	Mineral Wool Manufacturing	327993	13	6	(73,704)	3,575	323,292	53,882
Industrial	All Other Miscellaneous Nonmetallic Mineral Product Manufacturing	327999	2	2	-	-	47,596	23,798
Industrial	Iron and Steel Mills and Ferroalloy Manufacturing	331110	73	44	(1,570,344)	75,072	1,542,869	35,065
Industrial	Iron and Steel Mills^	331111	50	3	-	-	62,843	20,948
Industrial	Electrometallurgical Ferroalloy Product Manufacturing^	331112	1	0	-	-	-	-
Industrial	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel	331210	5	2	-	-	47,596	23,798
Industrial	Rolled Steel Shape Manufacturing	331221	6	2	-	-	47,596	23,798
Industrial	Primary Aluminum Production^	331312	2	0	-	-	-	-
Industrial	Alumina Refining and Primary Aluminum Production	331313	16	2	(508,999)	1,787	522,459	261,229
Industrial	Secondary Smelting and Alloying of Aluminum	331314	56	8	(59,846)	38,938	36,155	4,519
Industrial	Aluminum Sheet, Plate, and Foil Manufacturing	331315	6	2	-	-	47,596	23,798
Industrial	Aluminum Extruded Product Manufacturing^	331316	1	0	-	-	-	-
Industrial	Other Aluminum Rolling, Drawing, and Extruding	331318	2	0	-	-	-	-
Industrial	Nonferrous Metal (except Aluminum) Smelting and Refining	331410	1	0	-	-	-	-
Industrial	Primary Smelting and Refining of Copper^	331411	0	0	-	-	-	-
Industrial	Primary Smelting and Refining of Nonferrous Metal (except Copper and Aluminum)^	331419	2	0	-	-	-	-
Industrial	Copper Rolling, Drawing, Extruding, and Alloying	331420	3	0	-	-	-	-
Industrial	Copper Wire (except Mechanical) Drawing^	331422	1	0	-	-	-	-

(continued)

Table 3-6. Year 5 Avoided Cost for Sources under ALTERNATIVE SCENARIO 2 (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Year 5 (\$/Year)		Cost (\$)	
			Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 2	Estimated Costs (Savings)	Estimated Cost of Area Source Requirements	Avoided Costs Year 5	Average Avoided Cost/Entity
Industrial	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, and Extruding	331491	3	1	-	-	15,247	15,247
Industrial	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	331492	2	0	-	-	-	-
Industrial	Iron Foundries	331511	59	4	-	-	253,162	63,290
Industrial	Steel Foundries (except Investment)	331513	2	0	-	-	-	-
Industrial	Aluminum Die-Casting Foundries^	331521	1	0	-	-	-	-
Industrial	Aluminum Foundries (except Die-Casting)	331524	2	0	-	-	-	-
Industrial	Nonferrous Forging	332112	1	1	-	-	15,247	15,247
Industrial	Metal Crown, Closure, and Other Metal Stamping (except Automotive)	332119	1	1	-	-	15,247	15,247
Industrial	Hand and Edge Tool Manufacturing^	332212	1	1	-	-	15,247	15,247
Industrial	Prefabricated Metal Building and Component Manufacturing	332311	1	1	-	-	15,247	15,247
Industrial	Fabricated Structural Metal Manufacturing	332312	1	1	-	-	15,247	15,247
Industrial	Metal Window and Door Manufacturing	332321	5	5	-	-	285,511	57,102
Industrial	Sheet Metal Work Manufacturing	332322	1	1	-	-	15,247	15,247
Industrial	Metal Can Manufacturing	332431	14	11	(164,701)	2,989	477,717	43,429
Industrial	Other Metal Container Manufacturing	332439	4	3	-	-	62,843	20,948
Industrial	Bolt, Nut, Screw, Rivet, and Washer Manufacturing	332722	1	1	-	-	15,247	15,247
Industrial	Metal Heat Treating	332811	1	1	-	-	15,247	15,247
Industrial	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers	332812	433	332	(15,668,904)	236,898	16,097,597	48,487
Industrial	Electroplating, Plating, Polishing, Anodizing, and Coloring	332813	3	3	-	-	62,843	20,948
Industrial	Other Fabricated Metal Manufacturing	332990	1	1	-	-	15,247	15,247
Industrial	Small Arms Ammunition Manufacturing	332992	1	1	-	-	15,247	15,247
Industrial	Ammunition (except Small Arms) Manufacturing	332993	3	3	-	-	62,843	20,948
Industrial	All Other Miscellaneous Fabricated Metal Product Manufacturing	332999	3	3	-	-	62,843	20,948
Industrial	Farm Machinery and Equipment Manufacturing	333111	8	3	-	-	62,843	20,948
Industrial	Lawn and Garden Tractor and Home Lawn and Garden Equipment Manufacturing	333112	1	0	-	-	-	-
Industrial	Construction Machinery Manufacturing	333120	64	30	(375,844)	50,048	373,392	12,446
Industrial	Mining Machinery and Equipment Manufacturing	333131	2	0	-	-	-	-
Industrial	Printing Machinery and Equipment Manufacturing^	333293	1	0	-	-	-	-
Industrial	Photographic and Photocopying Equipment Manufacturing	333316	1	0	-	-	-	-
Industrial	Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing	333415	1	0	-	-	-	-

(continued)

Table 3-6. Year 5 Avoided Cost for Sources under ALTERNATIVE SCENARIO 2 (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Year 5 (\$/Year)		Cost (\$)	
			Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 2	Estimated Costs (Savings)	Estimated Cost of Area Source Requirements	Avoided Costs Year 5	Average Avoided Cost/Entity
Industrial	Machine Tool (Metal Cutting Types) Manufacturing^	333512	1	0	-	-	-	
Industrial	Machine Tool (Metal Forming Types) Manufacturing^	333513	1	0	-	-	-	
Industrial	Turbine and Turbine Generator Set Units Manufacturing	333611	1	0	-	-	-	
Industrial	Other Engine Equipment Manufacturing	333618	5	2	-	-	47,596	23,798
Industrial	Overhead Traveling Crane, Hoist, and Monorail System Manufacturing	333923	1	0	-	-	-	
Industrial	Welding and Soldering Equipment Manufacturing	333992	2	0	-	-	-	
Industrial	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	334220	1	0	-	-	-	
Industrial	Electron Tube Manufacturing^	334411	1	0	-	-	-	
Industrial	Bare Printed Circuit Board Manufacturing	334412	1	0	-	-	-	
Industrial	Semiconductor and Related Device Manufacturing	334413	23	15	-	-	610,184	40,679
Industrial	Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use	334512	1	0	-	-	-	
Industrial	Blank Magnetic and Optical Recording Media Manufacturing	334613	0	0	-	-	-	
Industrial	Electric Lamp Bulb and Part Manufacturing	335110	1	1	-	-	15,247	15,247
Industrial	Household Laundry Equipment Manufacturing	335224	13	9	(289,742)	5,231	332,107	36,901
Industrial	Other Major Household Appliance Manufacturing	335228	2	2	-	-	47,596	23,798
Industrial	Power, Distribution, and Specialty Transformer Manufacturing	335311	1	1	-	-	15,247	15,247
Industrial	Motor and Generator Manufacturing	335312	2	2	-	-	47,596	23,798
Industrial	Storage Battery Manufacturing	335911	1	1	-	-	15,247	15,247
Industrial	Current-Carrying Wiring Device Manufacturing	335931	1	1	-	-	15,247	15,247
Industrial	Noncurrent-Carrying Wiring Device Manufacturing	335932	1	1	-	-	15,247	15,247
Industrial	Carbon and Graphite Product Manufacturing	335991	6	4	-	-	253,162	63,290
Industrial	Automobile Manufacturing	336111	66	28	(566,161)	9,715	1,222,037	43,644
Industrial	Light Truck and Utility Vehicle Manufacturing	336112	5	4	-	-	253,162	63,290
Industrial	Heavy Duty Truck Manufacturing	336120	8	5	-	-	285,511	57,102
Industrial	Motor Vehicle Body Manufacturing	336211	8	5	-	-	285,511	57,102
Industrial	Truck Trailer Manufacturing	336212	1	1	-	-	15,247	15,247
Industrial	Motor Vehicle Gasoline Engine and Engine Parts Manufacturing	336310	2	2	-	-	47,596	23,798
Industrial	Carburetor, Piston, Piston Ring, and Valve Manufacturing^	336311	1	1	-	-	15,247	15,247
Industrial	Gasoline Engine and Engine Parts Manufacturing^	336312	3	2	-	-	47,596	23,798
Industrial	Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing	336330	2	2	-	-	47,596	23,798
Industrial	Motor Vehicle Brake System Manufacturing	336340	1	1	-	-	15,247	15,247
Industrial	Motor Vehicle Transmission and Power Train Parts Manufacturing	336350	2	2	-	-	47,596	23,798
Industrial	Motor Vehicle Seating and Interior Trim Manufacturing	336360	1	1	-	-	15,247	15,247

(continued)

Table 3-6. Year 5 Avoided Cost for Sources under ALTERNATIVE SCENARIO 2 (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Year 5 (\$/Year)		Cost (\$)	
			Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 2	Estimated Costs (Savings)	Estimated Cost of Area Source Requirements	Avoided Costs Year 5	Average Avoided Cost/Entity
Industrial	Motor Vehicle Metal Stamping	336370	1	1	-	-	15,247	15,247
Industrial	Other Motor Vehicle Parts Manufacturing	336390	13	7	-	-	316,005	45,144
Industrial	All Other Motor Vehicle Parts Manufacturing^	336399	2	2	-	-	47,596	23,798
Industrial	Aircraft Manufacturing	336411	125	107	(10,865,720)	70,995	11,222,400	104,882
Industrial	Aircraft Engine and Engine Parts Manufacturing	336412	8	5	-	-	285,511	57,102
Industrial	Other Aircraft Parts and Auxiliary Equipment Manufacturing	336413	10	6	-	-	300,758	50,126
Industrial	Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing	336415	1	1	-	-	15,247	15,247
Industrial	Railroad Rolling Stock Manufacturing	336510	1	1	-	-	15,247	15,247
Industrial	Ship Building and Repairing	336611	92	67	(3,332,500)	46,333	3,571,678	53,309
Industrial	Boat Building	336612	96	35	(543,631)	58,985	532,243	15,207
Industrial	Military Armored Vehicle, Tank, and Tank Component Manufacturing	336992	2	2	-	-	47,596	23,798
Industrial	Wood Kitchen Cabinet and Countertop Manufacturing	337110	347	263	(2,284,486)	380,808	2,489,948	9,467
Industrial	Upholstered Household Furniture Manufacturing	337121	2	2	-	-	47,596	23,798
Industrial	Nonupholstered Wood Household Furniture Manufacturing	337122	14	11	-	-	586,270	53,297
Industrial	Institutional Furniture Manufacturing	337127	1	1	-	-	15,247	15,247
Industrial	Wood Office Furniture Manufacturing	337211	5	5	-	-	285,511	57,102
Industrial	Office Furniture (except Wood) Manufacturing	337214	19	17	(386,803)	10,462	439,184	25,834
Industrial	Showcase, Partition, Shelving, and Locker Manufacturing	337215	1	1	-	-	15,247	15,247
Industrial	Blind and Shade Manufacturing	337920	1	1	-	-	15,247	15,247
Industrial	Surgical and Medical Instrument Manufacturing	339112	2	0	-	-	-	-
Industrial	Surgical Appliance and Supplies Manufacturing	339113	1	0	-	-	-	-
Industrial	Jewelry and Silverware Manufacturing	339910	1	0	-	-	-	-
Industrial	Sporting and Athletic Goods Manufacturing	339920	1	0	-	-	-	-
Industrial	Office Supplies (except Paper) Manufacturing	339940	1	0	-	-	-	-
Industrial	Gasket, Packing, and Sealing Device Manufacturing	339991	2	0	-	-	-	-
Industrial	Burial Casket Manufacturing	339995	3	1	-	-	15,247	15,247
Industrial	All Other Miscellaneous Manufacturing	339999	5	2	-	-	47,596	23,798
Commercial	Grain and Field Bean Merchant Wholesalers	424510	1	0	-	-	-	-
Commercial	Petroleum Bulk Stations and Terminals	424710	7	3	-	-	62,843	20,948
Commercial	Scheduled Passenger Air Transportation	481111	2	0	-	-	-	-
Commercial	Line-Haul Railroads	482111	1	0	-	-	-	-
Energy	Pipeline Transportation of Crude Oil	486110	1	0	-	-	-	-
Energy	Pipeline Transportation of Natural Gas	486210	257	123	(222,545)	71,497	3,473,519	28,240
Energy	Pipeline Transportation of Refined Petroleum Products	486910	1	0	-	-	-	-
Commercial	Support Activities for Rail Transportation	488210	3	1	-	-	15,247	15,247
Commercial	Marine Cargo Handling	488320	2	0	-	-	-	-
Commercial	General Warehousing and Storage	493110	180	65	(2,095,338)	482,773	1,612,565	24,809
Commercial	Other Warehousing and Storage	493190	6	2	-	-	47,596	23,798

(continued)

Table 3-6. Year 5 Avoided Cost for Sources under ALTERNATIVE SCENARIO 2 (2017\$) (continued)

Sector	NAICS Descriptions	NAICS	Facilities		Year 5 (\$/Year)		Cost (\$)	
			Number of Facilities Subject to MACT	Number of Facilities Under Alternative Scenario 2	Estimated Costs (Savings)	Estimated Cost of Area Source Requirements	Avoided Costs Year 5	Average Avoided Cost/Entity
Commercial	Lessors of Nonresidential Buildings (except Miniwarehouses)	531120	1	0	-	-	-	
Commercial	Testing Laboratories	541380	2	0	-	-	-	
Commercial	Research and Development in the Physical, Engineering and Life Sciences (except Nanotechnology and Biotechnology)^^	541715	2	0	-	-	-	
Commercial	All Other Support Services	561990	1	0	-	-	-	
Waste Treatment	Hazardous Waste Treatment and Disposal	562211	41	27	(2,396,177)	44,686	2,399,088	88,855
Waste Treatment	Solid Waste Landfill	562212	6	4	-	-	253,162	63,290
Waste Treatment	Solid Waste Combustors and Incinerators	562213	3	2	-	-	47,596	23,798
Waste Treatment	Remediation Services	562910	1	1	-	-	15,247	15,247
Educational Services	Colleges, Universities, and Professional Schools	611310	23	11	-	-	411,198	37,382
Commercial	Amusement and Theme Parks	713110	1	0	-	-	-	
Commercial	Linen and Uniform Supply	812330	1	0	-	-	-	
Commercial	Industrial Launderers	812332	3	1	-	-	15,247	15,247

Notes:

Six source categories from the assessed categories were identified that would not be affected by the change in policy: Decorative Chromium Electroplating, Hard Chromium Electroplating, Other Chromium Electroplating, Secondary Lead, Wool Fiberglass, and Portland Cement.

Out of these six categories, four area source categories are subject to a MACT standard where area sources in these categories are subject to the same HAP requirement for major sources in these categories: Decorative Chromium Electroplating, Hard Chromium Electroplating, Other Chromium Electroplating and Portland Cement. Because there are no differences in the requirements between major and area sources for these categories, there is no impact of the MM2A policy change on these categories and they were excluded from the table.

For Table 3-6, two columns—Estimated Costs Savings based on supporting statement costs and the Estimated Cost of Area Source Requirements—are incomplete because for the cost categories without RTR modeling files, we only have the extrapolated cost or savings for facilities in year 5 and not a breakdown of those cost savings by area source requirement costs or supporting statement cost savings. We have included all of the cost information that is currently available.

The blank cells in the “Average Avoided Cost/Entity” column represent source categories for which there are zero facilities eligible to obtain area source status.

For not directly assessed Source Category “Pulp & Paper (non-combust) MACT” (NAICS 322121), one facility is extrapolated to obtain area source status. However, in the estimation of Extrapolated Costs (Savings), “No facilities are expected to be area sources.” We assume the same when calculating the number of facilities expected to obtain area source status for this not directly assessed category.

NAICS 922140 (Correctional Institutions), NAICS 927110 (Space Research and Technology), NAICS 928110 (National Security) are government/public administration NAICS codes not covered by the Census. Hence, we have not included them in this table.

NAICS 999999 is an unclassified code and therefore, we have not included it in this table.

Note: The total number of facilities estimated to obtain area source status in this table is less than the sum in Table 1-3 because our analysis excludes Public Administration (NAICS 922140, 927110, and 928110) and Unclassified NAICS Code (999999) because the Census does not report data for these NAICS codes.

Sources: 2012 Economic Census; Eastern Research Group. August 2020a. ERG MM2A Database Memorandum, Analytical Evaluations & Summary of Industries Potentially Impacted by the Final Rule “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD; Eastern Research Group. August 2020b. ERG MM2A Cost Analysis Memorandum, Compliance cost savings analysis for the final rulemaking “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD.

NAICS 2012 and NAICS 2007 (<https://www.census.gov/eos/www/naics/downloadables/downloadables.html>).

3.3 Present Value and Equivalent Annualized Value Costs

To comply with EO 12866, the EPA also estimated the PV of the illustrative net cost savings for each scenario. The PV is the value of a stream of impacts over time, discounted to the current day. For this analysis, there is the presumption of an infinite time horizon, given that there is no review period for this action in the Clean Air Act unlike that for most rulemakings subject to that Act. In this analysis, we analyze the time stream of net cost savings for all potential reclassifications from year 1 (2021) to year 4 (2024), and then analyze the time stream of net cost savings from 2025 and beyond. The sum of the PVs for these two impact time streams form the total PV for this analysis. The PV of the cost savings for the primary scenario is \$0.86 billion (in 2017 dollars) at a discount rate of 7 percent, which is discounted to 2020. At a discount rate of 3 percent, the PV is \$1.50 billion (in 2017 dollars), again discounted to 2020. These results are lower than those estimated for the proposal, where the PV of the cost savings for the primary scenario was \$2.9 billion (in 2017 dollars) at a discount rate of 7 percent and \$6.2 billion at a discount rate of 3 percent (in 2017 dollars), discounted to 2020. The lower estimates for the final rule primarily reflect the overall lower cost savings due to fewer major sources that could potentially reclassify, and cost savings occurring later than estimated in the proposal.

A measure of the annual net cost savings is the EAV. This annual impact estimate is calculated consistent with the PV, and is estimated as the sum of the EAVs of the two cost time streams mentioned above. The EAV is \$67 million (2017 dollars) at a 7 percent discount rate for the primary scenario. At a 3 percent discount rate, the EAV is \$75 million (2017 dollars) for the primary scenario. The PVs for each alternative scenario and discount rate in 2017 dollars can be found in Table 3-7; the EAVs are in Table 3-8. These results are lower than those for the proposal (\$167 million at a 7 percent discount rate and \$173 million at a 3 percent discount rate in 2017 dollars) for the same reasons that the PVs differ between the proposal and final analyses. An explanation of why these estimates differ between the proposal and final analyses can be found in section 1 of this RIA.

Table 3-7. Estimated Present Value of the Net Cost Savings for Each ALTERNATIVE SCENARIO (billions of 2017\$) *

PV of Cost Savings by Alternative Scenario**	7% Discount Rate	3% Discount Rate
ALTERNATIVE SCENARIO 1 (50% of MST)	0.7	1.2
PRIMARY SCENARIO (75% of MST)	0.9	1.5
ALTERNATIVE SCENARIO 2 (125% of MST)	1.0	1.8

*These values can be converted to 2016 dollars by multiplying by 0.981 using the GDP implicit price deflators for 2016 and 2017. The value for 2016 is 105.770; the value for 2017 is 107.795, and these values can be found at <https://fred.stlouisfed.org/series/USAGDPDEFAISMEI>. The values shown in the table will not change given the rounding convention employed.

** The calculations for these PV of net cost savings are found in 5 spreadsheets in the docket for this rulemaking. They are: EO 13771 Workbook (2020)_MM2A_primaryscenario.xlsx, EO 13771 Workbook (2020)_MM2Afinalforstream1_50%MST_vf.xlsx, EO 13771 Workbook (2020)_MM2Afinalforstream2_50%MST_vf.xlsx, EO 13771 Workbook (2020)_MM2Afinalforstream1_125%MST_vf.xlsx, EO 13771 Workbook (2020)_MM2A_finalforstream2_125%MST_vf.xlsx.

Table 3-8. Estimated Equivalent Annualized Value of the Net Cost Savings for Each ALTERNATIVE SCENARIO (millions of 2017\$)*

EAV of Net Cost Savings**	7% Discount Rate	3% Discount Rate
ALTERNATIVE SCENARIO 1(50% of MST)	35	42
PRIMARY SCENARIO (75% of MST)	67	75
ALTERNATIVE SCENARIO 2 (125% of MST)	77	86

*These values can be converted to 2016 dollars by multiplying by 0.981 using the GDP implicit price deflators for 2016 and 2017. The value for 2016 is 105.770; the value for 2017 is 107.795, and these values can be found at <https://fred.stlouisfed.org/series/USAGDPDEFAISMEI>. The values shown in the table will change slightly given the rounding convention employed. As an example, the EAV for the primary scenario in 2016 dollars is \$51 million at a 7 percent discount rate and \$64 million at a 3 percent discount rate.

**The calculations for these PV of net cost savings are found in 5 spreadsheets in the docket for this rulemaking. They are: EO 13771 Workbook (2020)_MM2A_primaryscenario.xlsx, EO 13771 Workbook (2020)_MM2Afinalforstream1_50%MST_vf.xlsx, EO 13771 Workbook (2020)_MM2Afinalforstream2_50%MST_vf.xlsx, EO 13771 Workbook (2020)_MM2Afinalforstream1_125%MST_vf.xlsx, EO 13771 Workbook (2020)_MM2A_finalforstream2_125%MST_vf.xlsx.

SECTION 4.

ILLUSTRATIVE EMISSIONS IMPACTS AND POTENTIAL CONTROL COST IMPACTS

4.1 Estimating Number of Facilities per Source Category and the Fraction That Could Potentially Obtain Area Source Status

This chapter provides an illustrative assessment of potential impacts associated with HAP emissions in response to the MM2A rule to inform our analyses, including those of benefits or disbenefits that is presented later in this RIA. As has been discussed at length in final rule's documentation of the MM2A database and cost analysis, the assessment of facility response to the rule is uncertain due to the voluntary nature of the action, and many other factors that are specific to each facility. In this assessment, to illustrate the impacts of each analytical scenario we make assumptions in order to characterize the potential response and impacts, and clearly state how those assumptions impact the outcome of the assessment. In addition to approximating the response to the MM2A rule, we present information regarding potential changes in HAP emissions.

The assessment of facility participation in the MM2A action is transferred from the facility count assessment in the MM2A database memo. The facility count and the estimates of cost savings for facilities correspond with the emissions assessment presented here, however, in several source categories we determine in the assessment that there will be a cost savings with no impact on emissions.

In addition, we received numerous public comments stating that our analytical assessment should be expanded to include an evaluation of the entire major source NESHAP program rather than the subset of the source categories presented at proposal. Some commenters suggest through analyses submitted with their public comments, that every source with actual emissions below the major source threshold (MST) will reclassify, and every source will increase emissions to the maximum level permissible as an area source (i.e., up to 10 tpy of a single HAP or 25 tpy of a combination of HAP). The EPA disagrees with this characterization of impacts for several reasons.

First, the decision to reclassify to area source status is not a mandate and depends on many factors specific to the facility such as the ability to sustain emissions below the MST and not risk unintentionally emitting above the MST. To ensure facilities sustain emissions below the MST, they are likely to create operating plans that include a compliance margin (*i.e.*, operate at a reasonable level below the MST to guarantee they maintain area source status). Second, the

choice to reclassify would be pursued only if the action is a financial return to the company that weighs the costs of preparing for the reclassification action and the benefits of not having to comply with one or more major source NESHAP. If it is not advantageous from a business perspective for the source to undergo reclassification, they will not seek a change in status in response to MM2A, thus not all facilities below the MST will reclassify. A third analytical reason to not presume all facilities will emit up to the MST is the consideration that many industries and areas of the country have other federal or state regulations the effect of which will continue to limit HAP emissions after a source reclassifies to area source status. Finally, there are economic limitations on production levels that can impact the level of potential emission changes. To the extent that a source's emissions correlate with the level of production and the level of competitiveness in the markets it is in, a source will face competition and limitations associated with industry growth (which is linked to how much the product is demanded by consumers) that will create rigidity in a source's efforts to increase production and hence emissions. All of these factors will reduce opportunities to increase emissions to the maximum level permissible under area source status. Therefore, simply assuming all facilities will increase emissions (sometimes by more than 100x their current levels) is inaccurate and must be evaluated to properly characterize the response to the MM2A final rule and its impact on HAP emissions. We recognize that the commenters' analyses demonstrate the concern for emission changes in response to MM2A, and so the assessment for the final rule warrants an expansion from the approach used at proposal.

Review of Reclassification Actions Issued Since January 2018

At proposal, the EPA reviewed the reclassification actions of 34 sources that reclassified after January 2018. For the review of these reclassifications, the EPA evaluated the PTE and conditions set in permits prior and post reclassification to assess the potential for emission changes associated with the reclassification of the sources. For the final rule, the EPA expanded the analysis to include the reclassifications of 35 additional sources. The analysis and results of the EPA's review of these 69 reclassifications is detailed in the Technical Support Memorandum "Review of Reclassification Actions for the Final Rulemaking "Reclassification of Major Sources as Area Sources under Section 112 of the Clean Air Act" available in the docket of this rulemaking. The EPA's findings from the permit review and emission evaluation are that sources that had reclassified to area source status, in most cases, achieved and maintain area source status

by operating the emission controls or continuing to implement the practices they used to comply with the major source NESHAP requirements.

Illustration of Potential Impacts from Future Reclassifications for 72 Source Categories

At proposal, in addition to the review of actual reclassification actions, the EPA also prepared an illustrative analysis for six source categories to evaluate the potential emission impacts if facilities in those six categories were to reclassify to area source status under the MM2A rule. In the illustrative analysis of the six source categories, we reviewed a sample of operating permits in six source categories that represent a variety of industrial operations in the NESHAP program, including: coatings, heavy industry, chemicals, and energy. For these industries, we also evaluated control technologies employed to reduce HAP emissions and considered other regulations that may continue to apply to the source and how those regulations would impact HAP emissions.

For the final MM2A rule, we have updated the assessment conducted at proposal for the six source categories and expanded our assessment to numerous additional source categories in response to public comments (thus we assessed 72 categories in total). We identify several source categories that are not likely to experience a change in emissions as a result of MM2A (65 categories in total). We also conduct an in-depth analysis of potential changes in emissions upon reclassification for many source categories where we have information. We also review the updated operating permits for a variety of industrial processes to interpret likely response to the final MM2A rule.

4.1.1 Findings

Overall, out of the 114 source categories in the major source NESHAP program, we evaluated the potential emission impacts for 72 source categories in total. We determined that 65 source categories will not change HAP emissions as a result of the MM2A rule.¹⁴ After consideration of the information and data available for this analysis, we found that approximately 7.9 percent of the facilities in the primary scenario (or 3.1 percent of all facilities evaluated in the 72 source categories) assessed with data from available RTR modeling files in the MM2A database could increase emissions as a result of the MM2A rule. Under alternative scenario 2, we determined that some facilities operating between 75 and 125 percent of MST could decrease emissions as a result of the MM2A rule. In most cases the change in emissions is modest and

¹⁴ Some of the notable source categories that are not likely to change emissions as a result of MM2A include: Dry Cleaners, Integrated Iron and Steel Production, Municipal Solid Waste Landfills, Portland Cement Manufacturing, and Coal- and Oil-Fired Electric Utility Steam Generating Units.

limited by the factors discussed above. For those facilities, the total potential emission increase under the primary scenario ranges from about 919 tpy to 956 tpy¹⁵. These estimates apply to industrial source categories and assumes that facilities in the coatings sector will not reformulate their coatings to a higher HAP content. However, under an alternative set of assumptions in the coatings sector discussed in section 3.B of this memo, we add to the range presented above a potential increase in emissions from 0 tpy to 302 tpy of combined HAP to reflect the findings from one of the reclassification permits reviewed by the EPA that shows one facility could possibly increase emissions. The total range of emissions increase is, therefore, 919 tpy to 1,258 tpy. Under alternative scenario 2, the MM2A rule could potentially reduce emissions by about 183 tpy.

4.2 Determining Source Categories for the Emissions Assessment

The most accurate evaluation of the impact on emissions from the MM2A rule would require the latest detailed information about each source. Unfortunately, there are no known databases that continually compile and update the facility status and detailed information about these facilities, such as the PTE and limitations on emissions from other regulatory, technological, economic specifications. To obtain detailed facility data for this rulemaking would require a massive Information Collection Request (ICR) under CAA section 114 to be sent to the 7,000 or more facilities in the major source NESHAP program. Such an effort would be overly burdensome and resource intensive, very costly to industry and the public, and time prohibited (notwithstanding that any action to reclassify is completely voluntary).¹⁶ Another option is to obtain and evaluate Title V permits for each major source, however, such a system currently does not exist nationwide and therefore, this option is also resource prohibitive.¹⁷ Therefore, to evaluate the facilities operating in the major source NESHAP program under CAA section 112, we subdivide the analysis into the following segments using information available for each source category:

¹⁵ In addition, some facilities analyzed in the primary scenario have an estimated PTE that is above the MST, yet their actual emissions are well below 75 percent of the MST. These facilities might opt to reclassify by taking a limit on their PTE down to a level below the MST. This reduction in emissions can be viewed as foregone emissions under PTE. The foregone allowable emissions totals a reduction of about 193 tpy. Therefore, the net change in emissions for the seven source categories is a net increase of 726-763 tpy.

¹⁶ Based on past experience issuing CAA section 114 surveys, we note that it could take up to 3 years to prepare a section 114 notice, undergo review by OMB, issue a public notice, and gather the data.

¹⁷ In March 2020, EPA released the Electronic Permitting System for use by all states and EPA Regions. EPA is currently working with individual states to gradually adopt the system through direct entry or connecting to existing state electronic systems. In the future after full adoption of the system, the Electronic Permit System will serve as a repository for all title V permits issued nationwide that are sent to EPA for review.

- (A) identify source categories that are not likely to be impacted by the MM2A final rule,
- (B) identify source categories that will not change emissions for regulatory, technical, or economic reasons in response to the MM2A final rule,
- (C) for source categories that may have emission impacts, conduct an in-depth evaluation of data specific to each facility and source category, and
- (D) for source categories without readily available detailed facility data, we approximate the magnitude of potential impacts using broad assumptions and extrapolation or transfer of general information from a variety of sources.

4.3 Characterization of Affected Industries

As a good approximation of current facility characterization, we compiled all available data files used in recent Residual Risk and Technology Review (RTR) rulemaking efforts. For many of the RTR files, EPA created a detailed file to characterize facilities in the source category and their emissions for the purpose of assessing residual risk after compliance with the major source NESHAP. The data files are commonly referred to as the “RTR modeling file(s)” since the data is used to model risk and assess residual health risk to the public after compliance with CAA section 112 maximum achievable control technology (MACT) standards. At the time of this analysis, the EPA had the necessary data to evaluate 74 source categories.

There are many factors the EPA took into consideration in assessing the potential emission impacts from the various NESHAP source categories if facilities in these source categories were to reclassify to area source status. These include the consideration of backstop measures from regulatory and technological limits, as well as limitations on growth for economic reasons. As for regulatory reasons, the EPA assessed, if sources were to reclassify, whether they would be subject to the same NESHAP requirements as before reclassification; whether new area source NESHAP requirements will be applicable and how they impact emissions; whether there are NSPS requirements that control emissions at the same levels as the major source NESHAP requirements; and whether there are PSD/NSR/SIP requirements the effect of which we presume will continue to control HAP emissions to the same extent. As for the technological and economic reasons, the EPA reviewed whether the technology changes that have reduced emissions and could be reversed if sources were to reclassify to area source status. This includes, but is not limited to, changes in coating/adhesive formulations, fuel combustion technologies, and some level of backstop for emissions from add-on control technologies. Commenters stated that there are also other factors that will prevent emissions increases, including environmental management systems with which sources are engaged that require them to identify environmental impacts, to set performance objectives, to implement standards for training and

work practices, to audit implementation of such standards, and to take corrective action when deviations occur. Other commenters also mentioned that many sources are also required to meet Leadership in Energy and Environmental Design standards that incentivize efficient operations to minimize waste and energy usage, Occupational Safety and Health Administration requirements that protect workers from exposures to HAP and other pollutants, and toxics release inventory requirements. The commenters pointed that these regulatory requirements continue to apply even if the source reclassifies, providing additional incentives for sources to not increase emissions. The EPA agrees with the commenters that environmental management systems, even though they are voluntary and not regulatory in nature, will also provide additional incentives for some sources to maintain compliance with environmental legal obligations and not increase emissions.

Using these assumptions, the EPA determined 39 source categories are not impacted by the MM2A rule as detailed in the MM2A Database memo.¹⁸ We also determined that an additional 26 source categories (or a total of 65 source categories) will not change their emissions if they opt to reclassify under MM2A. For the remaining source categories for which the EPA had in-depth RTR modeling file data, we then proceeded to estimate potential emission changes for sources with actual emissions at or below our illustrative analytical scenarios. This memo focuses the analysis on the primary scenario that includes sources with actual emissions below 75 percent of MST (which also includes sources under alternative scenario 1 with actual emissions below 50 percent of MST)¹⁹, and the incremental effect of sources operating in alternative scenario 2 with emissions between 75 and 125 percent of the MST (*i.e.*, incremental from the primary scenario to alternative scenario 2).

A. Source Categories Anticipated to Have No Change in Emissions due to MM2A

Table 4-1 presents the source categories that based on the EPA's review of the facilities included in the MM2A database, will not change HAP emissions as a result of MM2A. The EPA determined that the source categories under segment (A) are not impacted by the MM2A rule and facilities will not seek reclassification to area source status. Detailed information regarding the source categories not impacted by the MM2A rule is detailed in the MM2A Database memo.

¹⁸ Eastern Research Group. *Documentation of the Data for Analytical Evaluations & Summary of Industries Potentially Impacted by the Final Rule "Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act"*. August 2020.

¹⁹ Some commenters on the proposed rule stated that the compliance margin assumed by the EPA of 25 percent in the primary scenario is too large, and the EPA should analyze impacts at 90 percent of the MST. See the cost memo in section 2 for more information regarding the EPA's reasoning for not assessing regulatory impacts at 90 percent of the MST.

The EPA does not assign the cost of reclassification to these source categories. In addition, for the source categories under segment (B) of this analysis, the EPA determined that while some facilities may have the potential to seek reclassification and estimated the cost of reclassification in the cost analysis²⁰ (hereafter referred to as “the Cost Analysis Memo”), the EPA determined that some facilities will not experience emission changes as a result of reclassification. Detailed assessments to characterize the potential for emission changes are provided for several source categories in Appendix A of the Illustrative Emissions Analysis memo.

²⁰ See “Documentation of the compliance cost savings analysis for the final rulemaking “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”” (Eastern Research Group, Inc, August 2020)

Table 4-1. Source Categories Determined to have No Change in Emissions under the MM2A Final Rule*

Source Categories Not Impacted by MM2A	Part 63 Subpart	Reasoning for Source Category Not Impacted by MM2A				
		Major/Area NESHAP the same	No sources in category	No NESHAP standard applicable	Emissions too High to reclassify	No Emission Change
Acetal Resins (GMACT I)	YY				1	
AMF (Acrylic/Modacrylic Fibers)	LLLLLL				1	
Asphalt Roofing	LLLLL		1			
Cellulose Products Manufacturing	UUUU			1		
Coke Ovens: Charging, Top Side, and Door Leaks	L				1	
Coke Ovens: Pushing, Quenching, & Battery Stacks	CCCCC				1	
Commercial Sterilizers	O	1				
Cyanide Chemicals (GMACT II)	YY	1				
Decorative Chromium Electroplating	N	1				
Dry Cleaners	M	1				
Dry Cleaners	M	1				
Ethylene Production	YY				1	
Ferroalloys	XXX				1	
Friction	QQQQQ				1	
GMACT-HF	YY	1				
Halogenated Solvent Cleaning	T	1				
Hard Chromium Electroplating	N	1				
Hazardous Waste Combustors	EEE	1				
Hydrogen Fluoride (GMACT I)	YY				1	
Integrated Iron and Steel	FFFFF				1	
Iron and Steel Foundries (Major Sources)	EEEEE				1	
Lime Manufacturing	AAAAA				1	
Magnetic Tape	EE		1			
Mercury Cell Chlor-Alkali Plants	IIIII	1				
Municipal Solid Waste Landfills	AAAA	1				
Nutritional Yeast	CCCCC				1	
Other Chromium Electroplating- Chromic Acid Anodizing	N	1				
Phosphate Fertilizer	BB				1	
Phosphoric Acid	AA				1	
Portland Cement	LLL	1				
Primary Copper	QQQ		1			
Primary Lead-facility closed	TTT	1				
Primary Magnesium Refining	TTTTT				1	
Secondary Lead	X	1				
Spandex (GMACT II)	YY			1		
Taconite Iron Ore Processing	RRRRR				1	
Turbines	YYYY			1		
Utility NESHAP	UUUUU	1				
Wool Fiberglass	NNN				1	
Source Categories with No Emission Change						
Aerospace - Privately Owned / Aerospace - federal government owned	GG					1
Asphalt Processing	LLLLL					1
Auto and Light Duty Truck	III					1
Boat Manufacturing	VVVV					1
Fabric	OOOO					1
Flexible Foam Production	III					1
Large Appliances	NNNN					1
Leather	TTTT					1

(continued)

Table 4-1. Source Categories Determined to have No Change in Emissions under the MM2A Final Rule* (continued)

Source Categories Not Impacted by MM2A	Part 63 Subpart	Reasoning for Source Category Not Impacted by MM2A				
		Major/Area NESHAP the same	No sources in category	No NESHAP standard applicable	Emissions too High to reclassify	No Emission Change
Metal Can	KKKK					1
Metal Coil	SSSS					1
Metal Furniture	RRRR					1
Mineral Wool	DDD					1
Misc. Metal Parts	MMMM					1
Miscellaneous Coating Manufacturing	HHHHH					1
Paper and Other Web Coatings: Surface Coating	JJJ					1
Plastic Parts	PPPP					1
Plywood and Composite Wood Products	DDDDDD					1
POTW	VVV					1
Primary Aluminum	LL					1
Pulp and Paper Combustion Sources	MM					1
Reinforced Plastic Composites	WWWW					1
Secondary Aluminum	RRR					1
Shipbuilding	II					1
Vegetable Oil	GGGG					1
Wood Building Products	QQQQ					1
Wood Furniture	JJ					1

*A “1” is used here as an identifier of why a source category is not included in the analysis.

Note: See section 3.B of the illustrative emissions memo for discussion regarding the permit review finding that one source that uses coatings in their manufacturing process out of the 69 reclassifications (completed between March 2019 and February 2020) might increase emissions after becoming an area source. All other reclassifications indicate no emissions change, 40 of which operate in the coatings sector. However, to acknowledge the possibility of other coatings sources to be permitted to increase emissions, we reflect the potential for emission increases under an alternative set of assumptions for the coatings sector.

4.4 Characterizing Potential Emission Impacts for Remaining Source Categories in the MM2A Database

The remaining source categories in the MM2A database with facilities that have actual emissions below the thresholds of the illustrative analytical scenarios described in the Cost Analysis Memo. To gain more understanding of the magnitude of impact across the source categories, we can further subdivide them into groupings defined by the number of facilities in each source category in the primary scenario as shown in Table 4-2 below. The first grouping includes industries in the major source program that have only one or two facilities affected (up to 5 facilities). This grouping was reviewed by EPA source category technical leads who know a great deal about individual facilities when the number of facilities is small. The second grouping includes industries with fewer than 35 facilities in the primary scenario. This group requires more speculation on the part of the EPA source category technical leads, but they continue to have extensive knowledge on many of the facilities within these categories. Using readily available information in the RTR project files along with the RTR modeling files, the technical

leads provide insights to the regulatory, technological, and economic conditions that would influence a facility's response to the MM2A rule. The characterization of each industry for which we were able to obtain information from an EPA source category technical lead is provided in Appendix A of the Illustrative Emissions Analysis Memo. The third grouping includes large industrial categories many affected facilities in which knowledge of the individual facilities is less likely, but modeling conducted by the EPA can inform the assessment.

Finally, the industries in the coatings sector have similar features to enable a grouping. We also combine boat manufacturing and reinforced plastic composites into the fourth grouping because they also have similar characteristics as the coatings sector. This grouping includes 18 source categories that constitute more than 60 percent of the total number of facilities potentially impacted under the MM2A rule. This grouping along with the permit review of facilities that have reclassified since January 2018 provide a thorough assessment of the coatings sector.²¹ We evaluated the likely response to MM2A for a subset of the coatings sector at proposal. For the final rule, we provided the MM2A database of information to the EPA technical leads for further input. The conclusion is the same as at proposal – that the source categories in this sector use formulations that are low-HAP and the majority of facilities are unlikely to reformulate at a substantial cost to increase HAP. In addition, most reclassifications completed in 2018 and 2019 are in the coatings sector and our review shows that almost all continue to have as enforceable condition after reclassification the use of low- or no- HAP coating formulations. Because all but one of the reclassified coatings facilities did not change emissions, we also include an alternative set of assumptions to evaluate the potential for some emission increase reflecting actions similar to the single facility whose permit reflect a potential for coatings emission increases.

We describe the methods used to estimate changes in emissions later in this RIA chapter. In general, the change in emissions is measured as the difference between PTE with compliance with the major source NESHAP and 75 percent of MST (the maximum emissions assumed with compliance margin for the primary scenario). Where the EPA does not have information on the PTE, we are estimating the potential change in emissions as the difference between actual emissions and 75 percent of the MST. Therefore, we measure increases or decreases to the 7.5/18.75 tpy level. However, in some cases it is inappropriate to assume changes from minimal amounts of HAP (i.e., less than 1 tpy) up to a maximum of 7.5/18.75 tpy as it represents a 100-times to 1000-times increase in emissions (and production to the extent that production and

²¹ *Review of reclassification actions for the rule "Reclassification of Major Sources as Area Sources under Section 112 of the Clean Air Act."* U.S. EPA (August, 2020).

emissions correlate). Given the production capacities at existing facilities²² along with economic constraints on growth, it is highly unlikely a facility would seek to increase emissions (and hence production) by 100-times to 1000-times. Most mature industries will not experience tremendous economic growth, and some may experience a declining rate of production that impacts growth. Therefore, we assume a conservative measure of increase for facilities operating at very low levels of HAP of 10-times (e.g., a facility operating at 0.5 tpy with no information on PTE would increase to 5 tpy). The measure for emission change in these instances could be higher or lower, but we selected 10-times to demonstrate a conservatively high level of potential emissions increase.

In addition, we measure the change in emissions based on a characterization of the primary source category under which the facility is associated. For facilities that comply with multiple major source NESHAP, we characterize the facility's emissions response based on the primary industrial activity of the facility. This assumption ignores the potential for changing HAP emissions from other emission points at the major source (i.e., combustion engines, boilers, process vents, and other manufacturing operations in the facility). This assumption adds to the litany of uncertainties associated with any assessment of the MM2A rule and further supports the selection of the compliance margin assumed in our analysis. The more operations that exist at a facility (i.e., the complexity), the more facilities will want to build in a reasonable compliance margin to maintain area source status. Overall, owners and operators of major sources that opt to apply for reclassification will weigh the benefits and costs of changing operations that affect their emissions and will select the lowest-cost opportunities to sustain their emissions below the MST including a reasonable compliance margin for the facility.

Our analysis of impacts from MM2A includes a reasonable compliance margin at which the Agency has greater confidence that all sources analyzed could maintain their area source status if they opt to reclassify. The selection of this compliance margin not only relates to the performance of HAP control technologies, but also incorporates the factors above that limit a sources ability to change emissions – the regulatory, financial, and economic considerations in determining whether to reclassify.

Table 4-2 presents the number of facilities in source categories considered for evaluation in the emissions analysis. The table includes all source categories considered for review, however, we were unable to conduct a detailed assessment of emission changes for the following categories: Brick, Pesticide Active Ingredients, Pharmaceuticals, Polycarbonates, Polyether

²² Modifications to a facility to increase capacity would face new source standards or PSD limits.

Polyols, the source categories of Polymers and Resins, OSWRO, and Wood Building Products. We present both the total number of facilities and the incremental number of facilities assessed across the analytical threshold scenarios. As can be seen in Table 4-2, most facilities in the MM2A database have actual emissions well below the MST (i.e., below 50 percent of the MST).

Table 4-2. Number of Facilities in Source Categories Included in Emissions Analysis: Incremental Across Illustrative Scenarios²³

Source Category	Total Major Source Facilities in Source Category	Total Number of Facilities Included in Emissions Analysis	Incremental Number of Facilities Across Illustrative Analytical Scenarios		
			50%	75%	125%
Group I: Source Categories with Fewer than Five Facilities Included in Emissions Analysis					
Asphalt Processing	8	2	1	0	0**
HCl Production	19	5	4	0	1
Leather	4	3	2	0	1
Mineral Wool	7	2	1	1	0
PAI (Pesticide Active Ingredient Production)*	18	5	2	2	1
Polycarbonates*	4	1	0	1	0
Primary Aluminum	13	1	0	1	0
Vegetable Oil	88	2	1	1	0
Wet Formed Fiberglass Mat	7	5	2	2	1
Group II: Source Categories with Five or More Facilities, But Fewer than 40 Facilities Included in Emissions Analysis					
Engine Test Cells/Standards	59	28	25	1	2
Flexible Foam Production	12	11	11	0	0
OSWRO	38	25	17	4	4
Polymers & Resins Source Categories (15 Source Categories)*	75	14	9	1	4
PEPO (Polyether Polyols Production)*	23	7	6	1	0
Pharmaceuticals*	26	10	2	4	4
Plywood and Composite Wood Products	233	82	13	12	57
POTW	10	7	6	1	0
Secondary Aluminum	52	7	5	1	1
Site Remediation	102	26	20	1	5
Steel Pickling	51	42	35	2	5
Wood Building Products	50	31	26	4	1
Group III: Source Categories with 40 or More Facilities					
Brick	74	55	41	6	8
Marine Vessel Loading	152	99	85	5	9
Miscellaneous Organic Chemical Manufacturing (MON)	197	50	22	11	17
Organic Liquids Distribution (Non-Gasoline) (OLD)	178	65	53	4	8
Refineries (2 Source Categories)	142	27	20	4	3
Group IV: Source Categories in the Coatings Sector, plus Reinforced Plastic Products and Boat Manufacturing					
Aerospace - Privately Owned / Aerospace - federal government owned	144	124	106	12	6

(continued)

²³ Facilities listed under the Alternative Scenario 1 (sources with actual emissions below 50 percent of the MST) are included in the assessment of emission changes under the Primary Scenario (75 percent of MST). Facilities listed under the Alternative Scenario 2 (125 percent of MST) are incremental to those listed at 75 percent of MST and are evaluated based on that incremental number of facilities.

Table 4-2. Number of Facilities in Source Categories Included in Emissions Analysis: Incremental Across Illustrative Scenarios²² (continued)

Source Category	Total Major Source Facilities in Source Category	Total Number of Facilities Included in Emissions Analysis	Incremental Number of Facilities Across Illustrative Analytical Scenarios		
			50%	75%	125%
Auto and Light Duty Truck	43	13	2	3	8
Fabric	43	28	22	2	4
Large Appliances	10	7	6	1	0
Leather	4	3	2	0	1
Metal Can	5	4	2	1	1
Metal Coil	48	37	31	4	2
Metal Furniture	16	14	9	1	4
Misc. Metal Parts	368	291	200	33	48
Miscellaneous Coating Manufacturing	43	24	16	1	7
Paper and Other Web Coatings: Surface Coating	171	68	46	9	13
Plastic Parts	125	67	38	15	14
Printing and Publishing	172	113	91	10	12
Shipbuilding	84	62	16	34	12
Wood Building Products	50	31	26	4	1
Wood Furniture	333	252	201	23	28

*Note: The Source Category Characterization for these source categories can be found in Appendix A of the illustrative emissions memo. We were unable to evaluate the following categories in-depth: Pesticide Active Ingredients, Pharmaceuticals, Polycarbonates, Polyether Polyols, the 5 source categories of Polymers and Resins, OSWRO, and Wood Building Products.

**There is one facility in the database under alternative scenario 2 listed in Asphalt Processing, which also has activities as a petroleum refinery. We do not include the facility as impacted under for alternative scenario 2 for Asphalt Processing because this facility has not operated the asphalt portion of the facility in recent years, so operations are more closely aligned with refining. The Refineries Emission Model indicates that any refinery that is above the MST will not be able to reduce to below the 10/25 (See the source category characterization for Refineries below for more information), therefore, will not opt to reclassify.

Estimation of Emission Impacts for Source Categories with Sufficient Information

To evaluate the potential response to the MM2A rule, we characterize technologies and processes employed, regulatory limitations, PTE, and likelihood of emission increases considering topics by considering the following questions:

- Are the facilities identified in each illustrative analytical scenario likely to reclassify to area source status?
- If they reclassify, would they change how they operate and increase or decrease emissions?
- What technologies do they employ, and will it be permissible to scaled back the use of these technologies after reclassification?
- What other regulatory provisions may limit the ability to increase emissions?

As discussed in the other documentation for this rule, there are numerous uncertainties in determining whether a facility will seek reclassification under the MM2A rule. The decision to reclassify is voluntary and conditions are specific to each individual facility. With regard to determining a change in emissions, if a facility were to reclassify the main factor determining any potential emissions increases is whether a facility could adjust the types of control technology, formulations, and process controls used to comply with the major source NESHAP requirements upon reclassifying. Specific considerations include:

- **Compliant Materials:** We considered that pollution prevention measures (e.g., process changes or switches to low-HAP surface coatings) as not adjustable. Source categories employing those measures as their compliance strategy for the applicable major source NESHAP could not readily increase or decrease emissions.
- **Add-on Control Equipment**
 - **Non-adjustable Controls:** We considered particulate controls for inorganic HAP (e.g., fabric filters, electrostatic precipitators) as not adjustable. Source categories employing those measures as their compliance strategy for the applicable major source NESHAP could not readily increase or decrease emissions.
 - **Adjustable Controls:** For adjustable controls (e.g., caustic scrubbers, RTOs), our analysis considered two different sets of assumptions. The first derives from the findings of our permit review presented above (sources continue to use the same compliance strategy before and after reclassification, and add-on controls are not adjusted to decrease control efficiency after the source is reclassified). The alternative set of assumptions addresses the potential emissions impact if sources taking PTE limitations were to be allowed to change the operating parameters of adjustable add-on control upon reclassifying.

We made the following assumptions for the illustrative emissions analysis given the plausibility that sources that reclassify might be allowed by their permitting authority to change the operating parameters of adjustable add-on control technologies once they become area sources.

- It is assumed that facilities that utilize compliant materials (i.e., low-HAP coatings) will not increase emissions.
- For a source category employing adjustable control technology, emissions could potentially increase for facilities with actual emissions below 75 percent of the MST.
- The baseline measure of emissions for the calculation of an emission change is determined as the facility's maximum allowable emissions under the major source NESHAP because facilities are permitted to emit up to the maximum level permissible and remain in compliance with the NESHAP regardless of the MM2A

rule. Often this is represented by the PTE, but in some circumstances the maximum allowable emissions from the RTR modeling files are used.

- Where we are unable to obtain a measure of the maximum allowable emissions under the NESHAP or PTE, we estimate the change in emissions from actual emissions documented in the MM2A database, which will overestimate the change in emissions.
- Under the analysis of the primary scenario, a potential increase in emissions was calculated for facilities operating an adjustable control technology in the following manner:
 - For sources with only a single HAP reported in the MM2A database and an adjustable control, the emission increase is calculated as the difference between 7.5 tpy (or 75percent of the MST for a single HAP) and the estimate of the single largest HAP emissions.
 - Otherwise, the potential emissions increase was estimated as the larger difference between 18.75 tpy and the estimate of total HAP emissions and between 7.5 tpy and the single HAP emissions.

Some commenters on the proposed rule suggest through analyses submitted with their public comments, that every source with actual emissions below the major source threshold (MST) will reclassify, and every source will increase emissions to the maximum level permissible as an area source (i.e., up to 10 tpy of a single HAP or 25 tpy of a combination of HAP). This characterization of impacts is not accurate for several reasons. First, the decision to reclassify to area source status is not a mandate and depends on many factors specific to the facility such as the ability to sustain emissions below the MST and not risk unintentionally emitting above the MST. The choice to reclassify would be pursued only if the action is a financial return to the company that weighs the costs of preparing for the reclassification action and the benefits of not having to comply with one or more major source NESHAP. If it is not advantageous from a business perspective for the source to undergo reclassification, they will not seek a change in status in response to MM2A, thus not all facilities below the MST will reclassify. Also, to ensure facilities sustain emissions below the MST, they are likely to create operating plans that include a compliance margin (i.e., operate at a reasonable level below the MST to guarantee they maintain area source status). Another analytical reason to not presume in our emission analysis that all facilities will emit up to the MST is the consideration that many industries and areas of the country have other federal or state regulations the effect of which will continue to limit HAP emissions after a source reclassifies to area source status. Finally, there are economic limitations on production levels that can impact the level of potential emission changes. To the extent that a source's emissions correlate with the level of production and the level of competitiveness in the markets it is in, a source will face competition and limitations

associated with industry growth (which is linked to how much the product is demanded by consumers) that will create rigidity in a source's efforts to increase production and hence emissions. All of these factors will reduce opportunities to increase emissions to the maximum level permissible under area source status. Therefore, simply assuming in our emission analysis that all facilities will increase emissions (sometimes by more than 100x their current levels) is inaccurate and must be evaluated to properly characterize the response to the MM2A final rule and its impact on costs and HAP emissions.

Also, we measure the change in emissions based on a characterization of the primary source category under which the facility's is associated. For facilities that comply with multiple major source NESHAP, we characterize the facility's emissions response based on the primary industrial activity of the facility. This assumption ignores the potential for reducing or increasing HAP emissions from other emission points at the major source (i.e., combustion engines, boilers, process vents, and other manufacturing operations in the facility).²⁴ This assumption adds to the litany of uncertainties associated with any assessment of the MM2A rule. Owners and operators of major sources that opt to apply for reclassification will weigh the benefits and costs of each emission point and the low-cost opportunities to sustain their emissions below the MST including a reasonable compliance margin for the facility.

For the coatings sector, while the majority of facilities that have reclassified since January 2018 will have no change in emissions as determined by a review of their permits, we found one case in which there could be a potential for a change in emissions relating to the coatings sector. Details of the review of each facility's emission requirements after reclassification are included in the memo *Review of reclassification actions for the rule "Reclassification of Major Sources as Area Sources under Section 112 of the Clean Air Act."* Because it is plausible for one facility out of the 69 included in our review to increase emissions according to their permit, we are incorporating an alternative set of assumptions in our conclusions of emissions impacts as well. We reviewed 69 operating permits for the sources that reclassified since January 2018 and found that over 65 percent of the sources operate in the coatings sector (46 out of the 69 sources). In the coatings sector, 40 out of the 46 reclassified

²⁴ It should be noted that the determination of potential emission changes focuses on the primary source category of business operations at each facility. Facilities with emission points in multiple source categories will employ a combination of measures to maintain area source status at the lowest cost. Therefore, an indication of no emission change in the primary source category of the business operation would not preclude the source from increasing emissions from another source category. This analysis does not evaluate these secondary level determinations of potential emission changes when a source operates in multiple source categories.

facilities used reformulation for compliance prior to reclassification and 13 percent used add-on control technologies to comply with their major source NESHAP.

The one facility that we found to have a potential emission increase in coatings emissions requested approval to change from a no-HAP coating to the purchase of a low-HAP coating after they were reclassified to area source status for another source category. The primary business function of the establishment is fabrication of metal transformers, and coating the unit is one element of the process. Therefore, this source would not be accounted for in the MM2A database as a coating facility, but rather as electrical equipment manufacturing. We continue to affirm that at most facilities with coatings as their primary business classification that reformulated their product under MACT to reduce emissions will continue to utilize similar formulations and not increase HAP. However, to account for the potential of some sources purchasing an alternative coating from a coatings vendor that results in increased emissions, we have included in our estimates a range of outcomes that incorporates this possibility. In this alternative outcome, we assume that 1 of 40 coatings sector facilities change the formulation used in their process after reclassification, representing 2.5 percent of all coatings facilities (along with the boat manufacturing and reinforced plastics facilities) incurring a change in HAP content of coatings from no HAP to HAP containing coatings. This results in an estimate of 27 coatings facilities (22 from surface coatings and 5 from Boat Manufacturing and Reinforced Plastic Composites) that increase their HAP emissions after reclassifying. For this analysis, we take five random samples of 27 facilities representing 2.5 percent of the coatings facilities in the MM2A database with emissions below 75 percent of the MST. We then averaged the results to ensure the results are not skewed by a single sample. We also assume that if the total HAP and single HAP emissions for a facility were each less than 1 tpy, the emissions increase would be only 10 times the actual emissions. For other facilities, we assumed the facility would increase emissions up to 18.75 tpy of total HAP. The total estimated increase from 27 coating facilities would be 302 tpy of HAP. The average increase per facility that increased emissions would be about 11.2 tpy of HAP.

Finally, to assess the potential for emission reductions, the illustrative emission analysis assumes that facilities with emissions between the 75 and 125 percent of the MST, regardless of the existing control employed for meeting the major source NESHAP standards, would need to decrease emissions to 7.5 tpy of a single HAP and 18.75 tpy of combined HAP to reclassify to area source status.

Source Category Characterizations and Findings

At proposal, EPA characterized the response to MM2A for a sample of six source categories that represented a variety of industrial processes in the major source NESHAP

program. Based on public comments requesting EPA expand the analysis to include all source categories in the program, we have expanded the detailed source category characterization of response to the MM2A final rule. Below is a summary characterization for each of the source categories we were able to evaluate in-depth for the final rule. Each summary characterizes the regulatory, technical and economic options that form our understanding of how facilities in the source category will respond to the MM2A rule, including engineering considerations of operations at the facility, control technologies employed, and magnitude and direction of emission changes from a baseline of the maximum allowable emissions under the MACT standard or the facilities PTE limits set in operating permits.

Where possible, we conduct detailed modeling to assess the PTE and the potential change in emissions. This level of analysis was viable for the refining industry and is presented in more detail below.

When detailed modeling is not available, we attempt to review each facility's operating permit within a source category to determine the PTE allowable in the baseline. In many cases, we obtained only a portion of operating permits for facilities in the source category. If we were able to obtain the permits for all impacted facilities, we conduct a detailed assessment for each individual facility and answer the questions above to determine the response to the regulation.

Then, for some source categories, the EPA source category technical lead with known expertise in the industry from the assessments of the RTR and technology review provided an overview of the industry and in some cases of each individual facility to determine how they might respond to the MM2A final rule. In these cases, we are not able to define PTE through modeling or permit review. Therefore, we calculate the change in emissions as 18.75 tpy (or 10 times the actual emissions) minus the actual emissions of total combined HAP listed in the MM2A database.

Utilizing Industry Sector Emission Modeling

Refineries

For the two Refineries source categories, we ran the Refineries Emission Model (REM) used in recent rulemakings. The Refinery Emission Model (REM) is an Access database model used to characterize hazardous air pollutant (HAP) emissions from all processes typically present

at a petroleum refinery.²⁵ The REM provides source characteristics and HAP emission estimates for each of the following emission sources:

- Process heaters and boilers
- Flares/thermal oxidizers (includes marine vessel loading emissions)
- Wastewater collection and treatment systems
- Cooling towers
- Fugitive equipment leaks
- Tanks (both storage and process tanks)
- Truck and rail (product) loading operations
- Catalytic reforming unit (CRU) catalyst regeneration vents
- Catalytic cracking unit (CCU) catalyst regeneration vents
- Sulfur recovery units (SRU) or sulfur plant vents.

The REM model is updated frequently with current data and has received considerable public review during rulemaking efforts on the Refinery Sector Rule for air toxics issued in 2015. It presents each facility's PTE under the respective NESHAPs (i.e., the baseline of what is permissible under the MACT standards) and calculates the potential increase in emissions as the difference from the MACT maximum level of emissions permissible and the 75 percent threshold of emissions (i.e., 18.75 tpy). We then calculate the change in emissions as the difference between 18.75 tpy minus PTE. This represents the potential change in emissions from the maximum level permitted in the baseline and post-regulation level of emissions from the illustrative MM2A primary scenario which incorporates the compliance margin discussed above (i.e., at 75 percent of the MST). For facilities where we are unable to calculate PTE, we assume an emission change based on the difference between 18.75 tpy and the actual emissions in the MM2A database, or 10 times emissions in a limited number of cases.

In addition, some facilities identified in the MM2A database in the primary scenario have an estimated PTE in the REM that is above the MST, yet their actual emissions are well below 75 percent of the MST. These facilities might opt to reclassify by taking a limit on their PTE

²⁵ Source: *Petroleum Refinery Source Characterization and Emission Model for Residual Risk Assessment*. Report prepared by Research Triangle Institute for the U.S. Environmental Protection Agency, 2002. Available at: https://www3.epa.gov/ttn/chief/efpac/protocol/refinery_RR_model_documentation_Final.pdf.

down to a level below the MST. For these facilities, we calculate the reduction in PTE that the facility must take to modify their PTE down to 18.75 tpy. This reduction in emissions can be viewed as forgone emissions under PTE. Actions taken to lower PTE are highly dependent on the actions of the permitting authority and the facilities' demonstration of emission limits needed to ensure they can sustain emissions below the MST. For the 24 facilities in the MM2A database in the two source categories that represent refineries, the total potential increase in emissions is about 113 tpy, and forgone allowable emissions under some facilities current PTE down to the MST totals a reduction of about 205 tpy. Therefore, the net change in emissions for the refining source categories if all 24 facilities reclassify is a reduction of 92 tpy. EPA determined that no facilities in the alternative scenario 2 will opt to reclassify due to limited availability of additional control options to reduce emissions below the MST. Table 4-3 provides estimates of potential emissions changes at refineries under the primary scenario.

Table 4-3. Estimation of Potential Emission Change for Petroleum Refinery Facilities in the PRIMARY SCENARIO

Refinery Facility Name	Best Total HAP Estimate in MM2A Database (tpy)	Refineries Emission Model PTE Total HAP (tpy)	Potential Emission Increase (tpy)	Forgone Allowable Emissions under PTE down to the MST (tpy)
AGE Refining & Manufacturing	13.35	24.90	0.00	
Eagle Springs Refinery	6.29	7.40	11.35	
Navajo Refining Co. - Lovington	2.91	NA	15.84	
Silver Eagle Refining – Evanston	17.06	13.90	4.85	
CITGO Refining & Chemicals Co., LP	2.59	NA	16.16	
ConocoPhillips - Santa Maria	3.35	NA	15.40	
Greka Energy	1.21	19.86	0.00	-1.11
VALERO - Wilmington (Asphalt Plant)	2.35	13.42	5.33	
KERN Oil & Refining Company	11.25	36.11	0.00	-17.36
San Joaquin Refining Company, Inc.	8.25	37.06	0.00	-18.31
Lunday-Thagard Oil Co.	0.67	17.46	1.29	
CITGO Asphalt Refining Company	10.89	16.04	2.71	
BP Exploration (Alaska) Inc.	6.53	14.06	4.69	
ConocoPhillips - Kuparuk Plant	3.71	16.03	2.72	
Petro Star Inc. - North Pole	1.23	20.21	0.00	-1.46
Petro Star - Valdez Refinery	1.05	52.60	0.00	-33.85
Edgington Oil Company	0.56	NA	5.64	
Big West Oil LLC (prev. Shell Oil Products US)	0.84	NA	8.37	
Flint Hills Resources Alaska, LLC	15.42	87.86	0.00	-69.11
Calumet Lubricants Co. LP - Princeton	5.85	17.98	0.77	
Ergon Refining, Inc.	10.91	17.37	1.38	
Goodway Refining, LLC	0.35	6.34	12.41	
Calcasieu Refining Co.	14.42	82.19	0.00	-63.44
Somerset Refinery	1.19	14.86	3.89	
Total			112.79	-204.64

Updated Illustrative Analysis of Source Categories Reviewed at Proposal

Hydrochloric Acid Production

We reviewed operating permits and found that under one set of assumptions for our illustrative analysis, we could expect them to operate scrubbers to control emissions from HCl and Cl₂ at the same control level as MACT, *resulting in no potential increases* in emissions due to the reclassification.

Under a second set of assumptions for our illustrative analysis, we reviewed whether these four facilities could potentially be allowed to adjust the operating parameters to achieve less than 99 percent reduction of HCl and Cl₂.

Two facilities have requirements in their permits that would prevent changes in operating parameters for HCl control or would require the continued use of a scrubber. Therefore, we assume the control technology will serve as a backstop for emissions and it is unlikely that they will change emissions as a result of reclassification.

However, we calculate an emission change if one assumed the level of control is less than 99 percent.

- One facility has a permit limit on annual HCl emissions that is at least as stringent as the NESHAP; this state requirement would prevent any potential for changes to the operating parameters of the add-on controls. Based on this review, we would expect no emissions increases if this facility were to reclassify.
- One facility according to their 2016 permit, will no longer be manufacturing HCl and will be only storing purchased HCl and the HCl storage tanks will be vented to an HCl scrubber. The facility is also subject to the HON.

Permit reviews for another two facilities show no other requirements that would limit emissions or that require capture and control systems that could serve as backstops, so we calculate a change in emissions for these facilities. We calculate an emission change if one assumed the level of control is less than 99 percent.

In conclusion, for the analysis of the primary scenario, we determine that there may not be an emission increase for this source category. Under another set of assumptions, we determined that if these four facilities were to reclassify and we assume HCl and Cl₂ are controlled at a lower percentage reduction (less than 99 percent control), emissions could increase by a total of 8.39 tpy for a single HAP or 22.31 tpy for combined HAP.

We estimate one additional facility has emissions between 75 and 125 percent of the MST. Based on this review, we would expect some emissions decrease (0.7 tpy HAP for a single HAP) from this facility if it were to reclassify. As noted above, facilities will consider the costs to reduce emissions as part of their decision to reclassify. We examine this in our analysis of the illustrative alternative scenario 2 as applied to several source categories. This analysis can be found later in this RIA.

Organic Liquids Distribution (OLD Non-Gasoline)

The technology basis of the major source NESHAP standard for storage tanks is a floating roof or closed vent system and control device (combustion, scrubber, or adsorber) with a 95 percent reduction; for transfer racks, it is a closed vent system and control device (combustion) with 98 percent destruction; for equipment leaks, it is an LDAR work practice; and for transport vehicles, it is a vapor tightness or vapor collection certification work practice.

The MM2A database indicates 178 facilities in the OLD source category, and many are subject multiple NESHAP. Based on our methodology to reduce double counting of facilities that are subject to multiple NESHAP, 99 of those OLD facilities are counted in the MM2A database under OLD instead of another NESHAP and 79 are associated with another source category for the MM2A analysis (e.g., HON, MON, MCM,²⁶ coating and printing).

Of the 99 OLD facilities identified, 23 facilities are also subject to NSPS 40 CFR part 60 subpart Kb (“Standards for Volatile Organic Liquid Storage Vessels, Including Petroleum Liquid Storage Vessels, for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984.”) and some could also be subject to state or local VOC standards if located in ozone nonattainment areas.

We estimate 57 of the OLD facilities in the primary scenario and a subset of 12 of these 57 facilities are subject to NSPS subpart Kb, which would limit the ability to increase emissions.

Consistent with the findings of our permit review, under one set of assumptions for our illustrative analysis, if these sources were to reclassify we could expect them to operate the combustion devices to control emissions from organic HAP from tanks and transfer racks at the same level as prior to reclassification, resulting in no potential increases in emissions due to the reclassification.

²⁶ HON = Hazardous Organic NESHAP (subparts F, G, H, and I), MON = Miscellaneous Organic NESHAP (subpart FFFF), and MCM = Miscellaneous Coatings Manufacturing NESHAP (subpart HHHHH).

Under a second set of assumptions for our illustrative analysis, we reviewed whether these 57 facilities could be allowed to adjust the operating parameters to achieve less than 98 percent destruction of organic HAP. First, we determined which of these 57 facilities are in ozone nonattainment areas. We then reviewed the permits for a sample of six facilities located in ozone nonattainment areas to assess whether there are existing state rules or other permit conditions that could prevent the facility from increasing emissions if the facility obtained area source status.

Based on the permit review, at the 75 percent threshold three facilities would not be expected to increase emissions because they are subject to state rules or permit requirements that directly or indirectly affect HAP emissions. For the remaining 54 facilities, if these facilities were to reclassify and the permit required organic HAP control at a lower percentage reduction (rather than 95-98 percent control), there could be a potential emission increase of 659 tpy (for combined HAP). However, if the NSPS subpart Kb acted as a backstop for 12 of these facilities, the potential for emissions increases would be reduced to 480 tpy (for combined HAP), a difference of 179 tpy of HAP. Another consideration, however, is that a portion of HAP emissions (21 percent) at OLD facilities is from transfer racks and equipment leaks, which are not regulated by the NSPS subpart Kb. Therefore, at the 12 facilities subject to NSPS subpart Kb, transfer racks and equipment leaks may represent about 37 tpy of the potential HAP increase (i.e., 21 percent of 179 tpy), and this increase would not be prevented by NSPS subpart Kb. Therefore, the potential HAP emissions increase could be slightly higher because there is no NSPS backstop on emissions from transfer racks, equipment leaks, or wastewater operations. In conclusion, we estimate a total potential emission increase from the OLD source category in a range from 480 – 517 tpy.

The MM2A database includes eight facilities in alternative scenario 2. Based on this review, we would expect some emission decreases (18 tpy for combined HAP) from these facilities if they were to reclassify.

Surface Coating of Metal Cans

The technology basis of the major source NESHAP standard is a combination of low-HAP coatings and add-on controls (e.g., thermal oxidizers). Some facilities may be subject to NSPS subpart WW (beverage can surface coating) and could be subject to state rules based on CTG. Based on the MM2A database, five facilities are subject to this NESHAP, and three facilities are in the primary scenario.

We review the operating permits for all three facilities and determined they use thermal oxidizers to comply with the NESHAP and they are required to capture and control VOC separate from the NESHAP requirements. If these facilities reclassified, the state requirements would necessitate them to continue to operate the control technologies as they have done in the past. Based on this review, we would expect no emissions increases from these facilities if they were to reclassify.

We estimate one facility in alternative scenario 2 and could potentially reclassify. Based on this review, we would expect some potential for emission decreases (4 tpy for combined HAP) from this facility if it opted to reclassify. As noted above, facilities will consider the costs to reduce emissions as part of their decision to reclassify. We examine these costs in our analysis of alternative scenario 2 as applied to several source categories. This analysis can be found later in this section of the RIA.

Surface Coating of Miscellaneous Metal Parts and Products

The technology basis of the major source NESHAP standard is low-HAP coatings for all subcategories (except magnet wire, for which the standard is based on the use of a catalytic oxidizer that is part of the curing oven and is integral to the process).

Facilities in this source category are not subject to an NSPS, but they may be subject to state rules based on 1978 and 2008 CTGs. Facilities that are area sources may be subject to the area source NESHAP standard for paint stripping and miscellaneous surface coating operations (subpart HHHHHH).

Based on the MM2A database, 368 facilities are subject to this NESHAP. We estimate 233 facilities in the primary scenario. Compliance with major source NESHAP can be demonstrated by (1) compliant coatings; (2) an emission rate without add-on controls; or (3) an emission rate with add-on controls. We reviewed the permits from 107 major source facilities and determined that a majority of the facilities are using the first and second compliance options, and approximately 30 percent of these facilities have add-on controls. Because they have either already re-engineered their coatings or use emission controls (including controls that are integral to their curing ovens) supports a conclusion they will continue to use low-HAP coatings and controls to comply with any VOC coating limits. In conclusion, we expect no emissions increase from these facilities if they were to reclassify.

The MM2A database includes 48 facilities in alternative scenario. We expect surface coating sources would review their engineering calculations to ensure they are not over-

estimating the annual HAP emissions they are reporting. They would also probably examine the solvents used in their cleaning operations and consider replacing any HAP-containing solvents with non-HAP solvents to reduce their emissions. Finally, they would speak to their coating supplier to see if lower-HAP coatings are already on the market that could meet their specifications without having to invest in “reformulation,” so the only investment would be some testing of the new coatings. Based on our review, we would expect some emission decreases (79 tpy of single HAP and 53 tpy for combined HAP) from these facilities if they were to reclassify as area sources.

Wet-Formed Fiberglass Mat Production

The technology basis of the major source NESHAP standard is the use of thermal oxidizers or similar controls (e.g., RTO, regenerative catalytic oxidizer) and the demonstration of compliance with the percent-reduction requirement (96percent destruction efficiency of formaldehyde). Formaldehyde-free resins are used in limited applications.

There are no individual state rules/NSPS/CTG that limit HAP from these sources, though some may be subject to state VOC limits.

The MM2A database indicates seven facilities are subject to the NESHAP. We estimate four facilities in the primary scenario. Based on permit reviews, two facilities have permit requirements associated with VOC control. Because formaldehyde is a VOC, we assumed that if these two facilities were to reclassify, the state requirements would prevent any potential for changes to the operating parameters of the add-on controls. Based on this review, we would expect no emissions increases if these two facilities were to reclassify.

In a review of a third facility’s permit, we determined that it is not subject to any NESHAP and is, therefore, not impacted by MM2A. The fourth facility’s permit indicates that it is not subject to other state rules limiting VOC or HAP emissions or that require operation and maintenance of an emission capture and control system. The latter source demonstrates compliance with the percent-reduction NESHAP standard, indicating >96 percent control, and most of that level of control would be needed to maintain area source status.

As a result of a review of operating permits for this source category, we determined that under one set of assumptions for our illustrative analysis, if these sources were to reclassify we could expect them to operate the add-on controls at the same control level as prior to reclassification, resulting in no potential increases in emissions due to the reclassification.

Under a second set of assumptions for our illustrative analysis, we reviewed whether these four facilities could potentially be allowed to adjust the operating parameters to achieve less than 96 percent reduction of formaldehyde. We found that only one facility has a potential to increase emissions under this set of assumptions. If it were to reclassify and the permit requires control of formaldehyde at a lower percentage reduction (less than 96 percent control), emissions could potentially increase (0.14 tpy for a single HAP or 9.5 tpy for combined HAP).

The MM2A database indicates one facility has emissions between 75 percent and 125 percent of the MST, and we estimate that emissions of a single HAP would be reduced by 0.6 tpy if it opted to reclassify.

Wood Furniture Manufacturing

The technology basis of the major source NESHAP standard is low-HAP coatings and high-efficiency application methods. The major source NESHAP limits formaldehyde content in coatings and adhesives used in wood furniture manufacturing and prohibits the use of conventional spray guns. The RTR confirmed that most facilities are using low- and no-formaldehyde coatings and contact adhesives and found only one facility using an add-on control.

These facilities are not subject to an NSPS, but they could be subject to state rules based on a 1996 CTG,²⁷ which is used in the establishment of reasonably available control technology (RACT) for VOC for ozone nonattainment areas.

The MM2A database includes 333 facilities are subject to the NESHAP. We estimate 224 facilities in the primary scenario. If facilities were to reclassify, we expect they would continue to comply with the limits on formaldehyde content in coatings and adhesives, and the prohibition on the use of conventional spray guns. These facilities have already reformulated their coatings and implemented spray application compliance requirements and would need to continue using these measures to maintain area source status. Therefore, we would expect no emissions increase from these facilities if they were to reclassify.

The MM2A database indicates 28 facilities in alternative scenario 2. Some of these facilities may already be using low-HAP coatings but have high production volumes. Others may rely on formulations that contain a higher percentage of HAP due to product specifications.

²⁷ Control of Volatile Organic Compound Emissions from Wood Furniture Manufacturing Operations. EPA-453/R-96-007. April 1996.

Based on this review, we would expect some potential for emission decreases (76 tpy single HAP, and 17 tpy for combined HAP) if these facilities were to reclassify as area sources.

Inference of Response from Available Data and EPA Technical Leads

For the final rule, we expanded our analysis of source categories and the assessment of emission changes in response to public comments. We utilize the same approach as is described in section C of the illustrative emissions impact memo to determine the potential response from the source category to the MM2A rule.

Asphalt Processing and Asphalt Roofing Manufacturing

The review includes two source categories related to asphalt production. The technology basis of the major source NESHAP standard is use of thermal oxidizers to meet PAH emission limits, or Electrostatic Precipitator (ESP) to meet alternative limits for PM. There is an area source NESHAP for these source categories and an NSPS is applicable to facilities built after 1982.

The MM2A database includes one facility in the primary scenario under Asphalt Processing. The Asphalt Roofing Manufacturing source category is not impacted by MM2A. According to a memo from the EPA source category technical lead who reviewed the facility's operating permit, the gaseous emissions are controlled by thermal oxidizers (afterburners) and PM emissions are controlled by baghouse fabric filters. The source has enforceable conditions in its permit requiring operation of afterburners and PM control equipment to achieve 95 percent control efficiency to limit major source status for 40 CFR section 52.2, Prevention of Significant Deterioration, which serves as a limit on their ability to increase emissions. As a result, this facility will not increase emissions as a result of reclassification under MM2A.

The MM2A database indicates one facility in alternative scenario 2. We determined that this facility is a petroleum refinery that also has dormant asphalt processing activities. The Refineries Emission Model indicates that any refinery that is above the MST will not be able to reduce to below the 10/25 (See the source category characterization for Refineries below for more information).

Engine Test Cells

The technology basis of the major source NESHAP is the use of catalytic or thermal incinerators (i.e., RTO). The NESHAP established four subcategories of engine test cell/stands including those used for testing:

- internal combustion engines of 25 horsepower or more;
- internal combustion engines of less than 25 horsepower;
- combustion turbine engines; and
- rocket engines.

Although the rule covers these four subcategories, it limits HAP only from new or reconstructed engine test cells/stands used for testing internal combustion engines of 25 horsepower or more located at a facility considered a major source of air toxics emissions.

The MM2A database includes 26 facilities in the primary scenario. Of the 26 facilities, only two facilities in the U.S. have controls being operated for purposes of the major source NESHAP. Only one of those facilities is indicated as operating in the MM2A database under the primary scenario with actual emissions of 1.4 tpy total HAP. According to the EPA source category technical lead, this facility could potentially opt to reclassify under MM2A, however any change in emissions would be limited by BACT requirements under state rules for Michigan. The requirements limit the emissions of all non-VOC toxic air contaminants using CO as a surrogate for air toxics. This facility currently operates an RTO. If the RTO were to be adjusted to lower temperatures under BACT, emissions would increase. We are unable to determine the exact change in emissions; therefore, we employ the approximation methods to determine emissions change (e.g., actual emissions x 10 to illustrate maximum potential risk change) and conclude that emissions could potentially increase by 14.1 tpy.

The MM2A database indicates two facilities in alternative scenario 2 that were not assessed in the illustrative emissions analysis.

Iron and Steel Foundries

Facilities in the Iron and Steel Foundries source category are not likely to reclassify. These sources have already installed add-on controls due to high emissions that the source will need to continue to operate if they were to reclassify. These sources would not be exempt from the monitoring and recordkeeping requirements, and it is unlikely that they would not want to incur the cost of reopening their air permits. The industry is also cautious due to uncertainties and the timing of the post-promulgation judicial review. As a result of this review, we concluded that this source category would not be impacted (as reflected in the MM2A database memo).

Leather Finishing Operations

Due to the substantial costs associated with reformulating a coating product and testing for quality assurance, the facilities in the MM2A database are not likely to alter the low HAP coatings currently in use. These facilities do not operate add-on pollution control technologies in order to comply with the Leather Finishing Operations NESHAP, therefore, such technologies are not a factor in determining if sources would alter their emissions as a result of the MM2A rule. , The facilities in question would be limited in their ability to increase production (and hence emissions) under the current plant structures. In addition, there are regulatory mechanisms applied to some facilities to limit VOCs emitted to the air that would also limit production and therefore HAP emissions. Finally, economic data indicates that the Leather industry is currently slowing in their production levels with a annual growth rate at -4.6 percent (available at IBISworld market research website, June 2020; www.ibisworld.com/united-states/market-research-reports/leather-tanning-finishing-industry). This indicates that the industry would be limited in its ability to increase production directly in response to the MM2A rule, and emissions as well. In conclusion, with the likely continued use of low HAP coatings and slow market growth in the industry, we conclude that emissions will not increase for this source category if facilities decide it is beneficial for their business and choose to reclassify. For alternative scenario 2, the EPA source category technical lead stated that there is a possibility of this facility adjusting production levels between this facility and another facility in the primary scenario and could reclassify. Because it would be a trade-off of emissions between facilities in the same source category, we do not include this in our estimate of emission reductions.

Marine Tank Vessel Loading Operations

For this analysis based on the applicability criteria of the Marine Tank Vessels Loading NESHAP, sources in the primary scenario are subject to the submerged fill standards for Cargo Filling Lines. The cargo filling lines requirement will continue to apply to these sources in the event they were to reclassify to area source status and no longer be subject to the NESHAP because these requirements are also Coast Guard requirements.

In addition, we reviewed a sampling of state requirements in those states with the most marine tank vessel loading (MVL) terminals are located. Many of these sources are located within areas regulated for VOC emissions and any VOC requirements applicable to these sources will also control HAP emissions. Below are some examples of VOC requirements applicable to MVL in three states:

- Texas: Texas requires 90 percent control of MVL at marine terminals only in the Houston/Galveston area counties (Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller Counties).
- Louisiana: Louisiana requires emission controls for MVL facilities with uncontrolled PTE of 25 tpy or more of VOC in the parishes of Ascension, East Baton Rouge, Iberville, Livingston, and West Baton Rouge, or 100 tpy or greater of VOC in any other parish. When loading liquids with vapor pressure ≥ 1.5 psia, a vapor collection and control system that reduces VOC 90 percent by weight must be used.
- Alaska: Alaska requires that VOC loading sources located only in the Port of Anchorage that have a design throughput of 15 million gallons (357,143 barrels) or more per year reduce VOC emissions by operating a vapor collection system and liquid product loading equipment that loads volatile liquid through submerged filling, and processes the collected vapors in a control device that emits no more than 10 milligrams of organic vapors per liter of volatile liquid loaded.

Based on this review, we would expect no emissions increases if these facilities were to reclassify to area source status.

The MM2A database indicates nine facilities in alternative scenario 2. Based on this review, we would expect some emission decreases (23 tpy for combined HAP) from these facilities if they were to reclassify. Analysis of potential control costs associated with these emissions decreases from this source category is included in the illustrative analysis for alternative scenario 2 for several source categories that is found earlier in this RIA.

Miscellaneous Organic Chemical NESHAP (MON)

The technology basis of the major source NESHAP standard are combustion control devices operating at a 95 to 99 percent combustion efficiency depending on the emission point, storage tank controls, and work practices for batch processes.

The MM2A database includes 197 facilities that are subject to the major source NESHAP and indicates 33 facilities in the primary scenario (22 of which operate below 50 percent of the MST). We reviewed the operating permits for the 33 facilities in the primary scenario. Our permit review focused on the potential to emit (PTE) HAP for each facility. We used that

information to calculate the maximum potential emission increase similar to the analysis conducted for the refineries source category.²⁸

Based on this review, it was determined that:

- Nine facilities are not likely to seek reclassification based on information contained in their permit. We did not consider these facilities for our emission analysis.
- Seven could potentially reclassify and it is highly likely that four of the facilities will reclassify because their permit says they are minor sources that are subject to subpart FFFF only because of the OIAI policy. Therefore, we consider these facilities in our analysis of emission changes below.
- For the remaining 17 facilities, we were unable to find the PTE information in their permits. For these facilities it is more uncertain whether they would seek to reclassify and how emissions might change as a result. *(For this analysis, we assume they could reclassify and measure emission change from actual emissions to 75 percent of the MST or applied the alternative calculation of 10 times the actual emissions).*

In addition, if MON facilities were to reclassify as area sources, they could potentially be subject to the Chemical Manufacturing Area Sources NESHAP (CMAS), which was issued in 2009 and amended in 2012. CMAS is the area source equivalent to the Hazardous Organic NESHAP (HON). The HON covers similar emission points at organic chemical facilities as the MON. However, CMAS covers fewer emission points and fewer pollutants than the HON and MON. While the MON requires control of all 187 listed HAP, CMAS only requires control of a small subset of HAP, including: 1,3-butadiene; 1,3-dichloropropene; Acetaldehyde; Chloroform; Ethylene dichloride; Hexachlorobenzene; Methylene chloride; Quinoline; Arsenic compounds; Cadmium compounds; Chromium compounds; Lead compounds; Manganese compounds; Nickel compounds; Hydrazine. There are also exemptions under CMAS if the affected systems do not use certain HAP listed in 40 CFR subpart VVVVVV as feedstocks or if they do not manufacture any listed HAP as byproducts or products.

Therefore, if the facilities detailed above were to reclassify (a total of 26 facilities), this source category could potentially increase total HAP emissions by about 280 tpy.

In addition, some facilities identified in the MM2A database in the primary scenario have an estimated PTE that is above the MST, yet their actual emissions are well below 75 percent of

²⁸ Some MON facilities have reclassified since January 2018 and the EPA has reviewed their operating permits in the memo, *Review of reclassification actions for the rule "Reclassification of Major Sources as Area Sources under Section 112 of the Clean Air Act"* and concluded that emissions will not change for those that have already reclassified.

the MST. These facilities might opt to reclassify by taking a limit on their PTE down to a level below the MST. For these facilities, we calculate the reduction in PTE that the facility must take to modify their PTE to down to 18.75 tpy. This reduction in emissions can be viewed as foregone emissions under PTE. Actions taken to lower PTE are highly dependent on the actions of the permitting authority and the facilities' demonstration of emission limits needed to ensure they can sustain emissions below the MST. For four facilities in the MM2A database in this category, the foregone allowable emissions totals a reduction of about 22 tpy. Therefore, the net change in emissions for the MON source category is a net increase of 258 tpy.

Seventeen facilities operate in alternative scenario 2 (seven of which are between 75 and 100 percent of the MST) with an estimated potential emission reduction of 59 tpy. Analysis of potential control costs associated with the estimated potential emissions reduction for these 17 facilities can be found in the illustrative alternative scenario 2 control cost memo (US EPA, Sorrels, August 2020).

4.5 Illustrative Source Category Cost Analyses for Alternative Scenario 2

The analysis of the illustrative 125 percent major source threshold (MST) scenario (or alternative scenario 2) prepared for the MM2A action focuses on major sources with actual HAP emissions at or above the major source emission thresholds (10 tons for one HAP, 25 tons for two or more HAP) up to 25 percent higher than the MST. In order to be eligible to reclassify to area source status, a source in this scenario will need to take enforceable PTE limitations below the MST and reduce its actual HAP emissions accordingly. The cost analysis for this scenario includes the positive permitting costs and the reduction in monitoring, recordkeeping and reporting costs associated with the reclassification to area source status. In addition, the sources in this scenario will incur cost (either operating & maintenance (O&M) or capital) to reduce actual emissions below the MST.

This analysis presents an effort to determine if source categories with sources that could be eligible to reclassify will be able to reduce emissions if necessary to reclassify, and then calculate the potential control cost for reducing HAP emissions from these source categories. This illustrative analysis is one way to characterize the potential control costs that a major source with actual emissions above the MST will consider in order to determine whether to seek reclassification to area source status. We analyze the control costs associated with the reduction of HAP emissions sufficient for sources with emissions of up to the alternative scenario 2 to reach the primary scenario (that is, emissions for the primary scenario for this final rule). Results of this analysis are not meant to serve as representative of impacts for all source categories

affected by this rule. This analysis is not applicable to sources at the other two scenarios examined in this final action (alternative scenario 1 and primary scenario), because sources affected by those scenarios have actual HAP emissions already below the MST.

The analysis is an update to the memo that was completed for the proposal MM2A.²⁹ This updated analysis reflects the revisions to the source inventory prepared for the cost and emission analyses done for the final rule. Please refer to the final rule emissions technical support memoranda (TSMs) on the MM2A database for more information on the revisions.

4.6 Source Categories Included in Analysis

To select the source categories for this analysis, we reviewed the results of the MM2A illustrative emissions analysis for the final rule.³⁰ The illustrative emissions analysis examined the potential for sources in these categories that could reclassify, and the potential impacts on emissions. The nature of this analysis is such that it serves to help define the selection of source categories included in this illustrative alternative scenario 2 analysis.

At proposal, we presented this analysis for six source categories to illustrate the costs some sources may decide to incur to if they opt to reclassify under MM2A. The source categories evaluated at proposal have been updated and include hydrochloric acid production (HCl), miscellaneous organic NESHAP (MON), organic liquids distribution (OLD), surface hat coatings of miscellaneous metal parts, stationary turbines³¹, metal can, and wood furniture. We received public comments requesting that we expand our analyses, including the alternative scenario 2 analysis, to additional source categories. Some commenters expressed that this illustrative analysis overestimated the potential for emission reductions from source categories, given that findings from most of the proposed and final Residual Risk and Technology Reviews (RTRs) have found no control technologies, whether due to technical infeasibility, or found not to be cost-effective, or available to further reduce HAP emissions.³²

²⁹ U.S. EPA, Larry Sorrels, OAQPS/HEID/AEG. Analysis of Illustrative 125% Scenario for MM2A Proposal – Potential Cost Impacts from HAP Major Sources Reducing Emissions as part of Reclassifying to HAP Area Sources. EPA Docket No. EPA-HQ-OAR-2019-0282. May, 2019. Available at https://www.epa.gov/sites/production/files/2019-06/documents/mm2a_proposal_memorandum_cost_considerations_125percent_scenario_final.pdf and in the docket for this rulemaking.

³⁰ U.S. EPA. MM2A DataSpreadsheet_2020. Available in the docket for this rulemaking.

³¹ It is noted that the stationary turbines source category is not part of this analysis for the final rule, though this category was included in the 125 percent scenario analysis at proposal. As described in the MM2A database memo, the sources in this category could reclassify absent MM2A. Hence, this source category is not included in this analysis.

³² U.S. EPA. Response to Comment (RTC) Document for MM2A. August 2020.

To select the source categories for the final rule illustrative analysis, we reviewed the results of the MM2A database update and facility count by source category under alternative scenario 2 and the results of the illustrative emissions analysis for the final rule.³³ There is a total of 74 source categories in the MM2A database for which we have detailed RTR modeling file data to determine which analytical scenarios they belong in. Sorting the MM2A database for those facilities with actual emissions between the MST and 125 percent of the MST displays 39 source categories - 24 of source categories are in heavy industry and 15 source categories in the coatings sector.

Then, we removed from consideration for this analysis those source categories for which we were unable to analyze in the emission impacts analysis due to insufficient information, specifically, Brick Manufacturing, OSWRO, P&R III, P&R IV (includes 5 categories), Pesticide Active Ingredients, Pharmaceuticals, and Wood Building Products (see Table 2 of the Illustrative Emissions memo) and focused on those source categories that might utilize add on control technologies to reduce emissions further.³⁴ The source categories left that have sources with emissions between the MST and alternative scenario 2 are listed in Table 4-4.

Table 4-4. Source Categories Considered for Final Rule Illustrative Analysis of ALTERNATIVE SCENARIO 2

▪ Engine Test Cells/Stands	▪ Marine Tank Vessel Loading
▪ Petroleum Refineries (2 categories)	▪ Steel Pickling
▪ Leather Manufacturing	▪ Plywood and Composite Wood Products
▪ Secondary Aluminum	▪ Wet-Formed Fiberglass

From the list of source categories in Table 4-4, we then determined that Leather Manufacturing, Petroleum Refineries, Secondary Aluminum, and Wet-Formed Fiberglass would not change emissions under alternative scenario 2 for reasons provided in the emissions memo and documentation included in the docket. Therefore, the remaining four source categories available for this analysis in addition to the source categories included at proposal are: Engine test cells/stands, marine tank vessel loading, plywood and composite wood products (PCWP), and steel pickling. According to relevant proposal or final RTRs, there are no add-on control technologies to further reduce emissions in the Engine test cells/stands, PCWP, and steel

³³ U.S. EPA. MM2A DataSpreadsheet_2020. Available in the docket for this rulemaking.

We presume that the coatings categories would rely on reformulations which would be too costly to pursue for reclassification. However, after reviewing the operating permits for some coatings categories at proposal, we found that some could reduce emissions and reclassify (i.e., wood furniture).

pickling source categories.^{35,36} Thus, of the 8 source categories in Table 4-4 only the marine tank vessel loading source category was added to the final illustrative alternative Scenario 2 analysis.

Table 4-5 provides a list of the remaining eight source categories and the number of sources assessed under alternative scenario 2. These sources are in categories where one of more sources might opt to reclassify under MM2A based on the results of the illustrative emissions analysis that is included earlier in this RIA. These eight source categories are listed in descending order of the number of sources eligible to reclassify. In addition, Table 4-5 includes the amount of emissions change estimated for each source category indicated in the illustrative emission impact analysis memo. For these eight source categories, all are expected to have HAP emissions decreases if the facilities were to decide to reclassify.

Table 4-5. List of Source Categories with Sources Having Actual HAP Emissions Between the PRIMARY SCENARIO and ALTERNATIVE SCENARIO 2

Source Category	No. of Sources with Actual Emissions Between the MST and 125% of the MST	Emissions Change by Source Category Under ALTERNATIVE SCENARIO 2 (Tons Per Year)*
Miscellaneous Metal Parts	48	-79
Wood Furniture	28	-17
Miscellaneous Organic NESHAP(MON)	17	-59
Marine Tank Vessel Loadings	9	-23
Organic Liquid Distribution (OLD)	8	-18
Metal Can	1	-4
HCl Production	1	-0.7
Wet Form Fiberglass	1	-0.6

*A negative sign denotes an emissions decrease.

We note that these eight source categories contain 113 sources that constitute 21 percent of 542 major sources across all source categories with sources having emissions between the primary scenario and alternative scenario 2. These eight source categories thus account for 21 percent of all the sources in the alternative scenario 2 and are listed in descending order of number of sources in alternative scenario 2.

4.7 Illustrative Potential Cost Analysis Approach

In this illustrative effort, we perform a “break-even” analysis to help inform whether a source would choose to apply add-on control devices and other control techniques to reduce

³⁵ U.S. EPA. NESHAP: Plywood and Composite Wood Products Residual Risk and Technology Review. Proposal. 81 FR 47092. September 6, 2019. Available on the Internet at <https://www.govinfo.gov/content/pkg/FR-2019-09-06/pdf/2019-18827.pdf>.

³⁶ U.S. EPA. MM2A TSM Appendix A. August 2020.

emissions under alternative scenario 2. We note that the impact on control costs was not a part of the illustrative emissions analysis; that analysis was based on emissions control technologies/techniques likely to be already in place on sources, and if non-HAP regulatory requirements may exist to reduce or prevent the potential for reclassifying (e.g., fabric filters for particulate matter (PM) control can also control metallic HAP), and other factors as mentioned earlier in this RIA.

Our illustrative analysis accounts for the findings of technology reviews prepared as part of recently proposed and promulgated Risk and Technology Reviews (RTRs). If a technology review for one of the seven source categories listed in Table 4-5 finds that no control technologies are available for additional control of HAP emissions, then our analysis does not include any control for this category. With that as a basis, we do not include any HAP control as part of the analysis of costs related to potential reclassification for the following four source categories: HCl production, Surface Coating of Metal Cans, and Miscellaneous Metal Parts. We find that there are available control technologies and practices for the following four source categories: MON, Marine Tank Vessel Loading Operations, Organic Liquid Distribution (OLD), and the Wood Furniture coatings source categories, based on the findings of the technology review for the final MON RTR,³⁷ technical documentation for the Marine Tank Vessel source category, the final OLD RTR,³⁸ and technical documentation for the Wood Furniture coatings source category.

This analysis includes the use of HAP control cost-effectiveness (that is, annual cost/ton HAP reduction) estimates for each of the relevant four source categories. These estimates can reflect the costs of HAP regulations previously imposed on these source categories, or represent EPA estimates of likely control options that sources could use to meet HAP emissions limits if such options exist. These estimates are then used in our approach to examine if sources in these source categories would apply representative control devices or techniques to reduce HAP emissions as part of an effort to reclassify. The cost-effectiveness estimates used in this analysis will include both capital (fixed) and O&M (variable) costs, for there was insufficient information

³⁷ U.S. EPA. NESHAP for Miscellaneous Organic Chemical Manufacturing, Residual Risk and Technology Review. Proposed Rule. 84 FR 69182. Published on December 17, 2019. Available at <https://www.federalregister.gov/documents/2019/12/17/2019-24573/national-emission-standards-for-hazardous-air-pollutants-miscellaneous-organic-chemical>. Downloaded on February 18, 2020.

³⁸ U.S. EPA. NESHAP for Organic Liquid Distribution, Residual Risk and Technology Review. Final Rule. Signed on March 12, 2020. Available in pre-publication form for the Federal Register at <https://www.epa.gov/stationary-sources-air-pollution/final-amendments-air-toxics-standards-organic-liquids-distribution>. Downloaded on May 5, 2020.

in the documentation for these estimates to present a breakout of annual costs into these two components.

We also derived, to the extent possible, cost-effectiveness estimates that do not include any monitoring, recordkeeping, and reporting costs that are already found in the cost savings analysis done for these source categories in order to limit double counting. The details of what are included in these cost-effectiveness estimates are shown in Attachment C of this RIA. We recognize that findings in the illustrative emissions memo show that the HAP control equipment in place prior to reclassification continues to be operated after reclassification for a substantial majority of these sources, which is discussed in more detail in Attachment B of this RIA.³⁹ Hence, with the control costs continuing to be incurred, and thus no expectation that investment in new or updated control equipment is needed, the most relevant cost for a determination of what cost value is “break-even” for purposes of this analysis would be the O&M costs.

With this in mind, the financial decision facing a company with a HAP major source having emissions above the MST and considering the choice of reclassifying to area source status is whether the reduction in O&M control equipment costs will be sufficient to serve as an incentive for the company to do so. This reduction in costs would have to be greater than the costs associated with completing the reclassification process, which would include costs of paperwork to submit (including meetings and interactions with officials) to the relevant regulatory agency (state or local) and any opportunity cost to the company such as not pursuing activities to improve its overall production efficiency from completing the reclassification process. The company will likely assess the effects of reclassification not only over a short-term, but long-term, depending on the typical investment life and discount rate (e.g., hurdle rate) that a company chooses to invoke in its investment decision making. We note that review of the 69 sources that have reclassified indicated these sources continue to use their control equipment for maintaining major source HAP status after reclassification.

Given the expectation of no change in capital expenditure as mentioned previously, using these HAP cost-effectiveness estimates therefore could lead to an overstatement of the annual cost per ton that could serve as a “break-even” value for a source to reduce emissions as part of reclassifying from major to area source. Again, use of results from this analysis should only be regarded as illustrative, for they do not reflect results from all, or most, source categories

³⁹ U.S. EPA. Memorandum from Elineth Torres to Docket No. EPA-HQ-OAR-2019-0282. DRAFT Documentation of the emission impacts analysis for the final rulemaking “Reclassification of Major Sources as Area Sources under Section 112 of the Clean Air Act.” August 2020.

potentially affected by this final action. Thus, they should not be used to present a complete analysis across all affected source categories included in the overall analysis, and that includes control cost impacts for alternative scenario 2.

We also acknowledge that the costs in these estimates may not reflect true marginal costs in that they presume the average costs of control, which are the types of costs available in the documentation available to EPA, are suitable for “break-even” decision-making by major sources considering reclassification.

4.8 Availability of HAP Control Technologies/Practices

We would expect that sources that experience reduced emissions if choosing to reclassify to apply additional HAP control, either from use of the existing or new control technologies or techniques, to reduce emissions according to the estimates from the illustrative emissions memo in order to assure reclassification.

We presume in this analysis that major sources would not choose to apply new controls that are available for installation but are deemed by the EPA to not be cost-effective in the context of a proposed or promulgated RTR for the relevant source category. Because a decision by a major source to reclassify is voluntary, a source could choose to incur control cost for HAP emission reductions if the source’s emissions are above the MST. Such a decision will be made by the source’s parent company based on a variety of factors, including the effect on profitability and its ability to change its output. Table 4-6 presents the HAP cost-effectiveness estimate used in this analysis for each of these source categories. All of these cost-effectiveness estimates are in 2017 dollars in order to be consistent with the year dollars for the annual cost savings estimates presented in the cost memo and RIA for this final action.

Table 4-6. HAP Cost-effectiveness Estimates for Source Categories with Available Control Technologies and Practices Included in Illustrative Analysis of ALTERNATIVE SCENARIO 2

Source Category	HAP Cost-Effectiveness Estimate (annual cost/ton HAP reduction in 2017\$)
Miscellaneous Organic NESHAP (MON)	36,572
Marine Tank Vessel Loading Operations	35,074
Organic Liquid Distribution (OLD)	2,958
Wood Furniture Coatings	33,645

Determination of the appropriate cost-effectiveness for each source category to use in this analysis is not always a straightforward matter. There are often differences in the extent and

timing of cost analyses for different source categories, and determination of an appropriate cost-effectiveness may require more than trivial amounts of analysis in individual circumstances. Below is a brief discussion of the cost-effectiveness estimates for each category that has available control technologies and practices and how these estimates are derived.

4.9 Cost-Effectiveness Estimate Derivation for Source Categories

Wood Furniture coatings – The estimate was taken from an EPA cost memorandum prepared in 2010 to examine HAP control options for facilities subject to the wood furniture coatings MACT.⁴⁰ The control option that is the basis for the cost-effectiveness estimate used in the current analysis is the use of low VOC coatings. The VOC cost-effectiveness estimate for this option is \$15,000/ton; with the amount of VOC that is HAP estimated at one-half, the resulting HAP cost-effectiveness is \$30,000/ton. With this estimate in 2010 dollars, we escalated the value to 2017 dollars by using the U.S. GDP implicit price deflator. This value is 1.120, where the 2017 value is 107.789 and the 2010 value is 96.111.⁴¹ Therefore, the cost-effectiveness in 2017 dollars is \$33,645/ton ($30,000 * (107.789/96.111)$).

Miscellaneous Organic NESHAP (MON)- The estimate was taken from the proposal RTR Federal Register notice, in which the cost-effectiveness of several control options was examined. There are two control options that were co-proposed in the RTR and have cost-effectiveness that ranges from \$32,586-\$39,206/ton)⁴² in 2016 dollars. We use the midpoint of the range to derive a cost-effectiveness for the current analysis of \$35,896/ton in 2016 dollars.⁴³ Escalation to 2017 dollars is accomplished the U.S. GDP implicit price deflator. This value is 1.019, where the 2016 value is 105.798 and the 2017 value is 107.789.⁴⁴ Therefore, the cost-effectiveness in 2017 dollars is \$36,572/ton ($35,896 * (107.789/105.798)$).

⁴⁰ U.S. EPA. Memorandum from Kaye Whitfield to Docket No. EPA-HQ-OAR-2010-0786. Cost Analyses for Control Options. September 27, 2010. Prepared for the Wood Furniture Manufacturing Operations NESHAP, Final Rule.

⁴¹ U.S. Federal Reserve Board, St Louis. Gross Domestic Product (GDP implicit price deflator). Index: 2012-100. Annual Values. Available at <https://fred.stlouisfed.org/series/A191RD3A086NBEA>. Downloaded on May 14, 2019.

⁴² These estimates assume potential excess emission reductions from flares. See the MON RTR for more details.

⁴³ U.S. EPA. Miscellaneous Organic NESHAP (MON), Final Rule. 68 FR 63852. Published in the Federal Register on November 10, 2003. Available at <https://www.govinfo.gov/content/pkg/FR-2003-11-10/pdf/03-22310.pdf>. Downloaded on May 14, 2019.

⁴⁴ U.S. Federal Reserve Board, St. Louis. Gross Domestic Product (GDP implicit price deflator). Index: 2012-100. Annual Values. Available at <https://fred.stlouisfed.org/series/A191RD3A086NBEA>. Downloaded on February 19, 2020,.

Marine Tank Vessel Loading Operations – The estimate was taken from the preamble for the final Marine Tank Vessel Loading Operation NESHAP published in September, 1995.⁴⁵ The estimate is based on the upper bound of estimated control costs (\$60 to \$100 million annually nationwide) for this final NESHAP. No other information on costs or cost-effectiveness was available from actions on this source category since 1995. This cost estimate is \$21,906/ton annually in 1992 dollars. Escalation to 2017 dollars is accomplished the U.S. Gross Domestic Product (GDP) implicit price deflator. This value is 1.019, where the 1992 value is 67.321 and the 2017 value is 107.789.⁴⁶ Therefore, the cost-effectiveness in 2017 dollars is \$/ton $(21,906 * (107.789/67.321)) = \$35,074/\text{ton}$.

Organic Liquid Distribution (OLD) – The estimate was taken from the national impacts memorandum for the final OLD RTR.⁴⁷ The estimate includes the control costs for two types of control techniques – lowering the vapor pressure threshold at storage tanks, and storage tank degassing. We do not include other control techniques in this memorandum due to lack of emission reduction estimates. This cost estimate is \$2,903/ton annually in 2016 dollars. Escalation to 2017 dollars is accomplished the U.S. GDP implicit price deflator. This value is 1.019, where the 2016 value is 105.798 and the 2017 value is 107.789.⁴⁸ Therefore, the cost-effectiveness in 2017 dollars is \$/ton $(2,903 * (107.789/105.798)) = \$2,958/\text{ton}$.

4.10 Results for Potential Cost Impact Analysis Considering the Illustrative Emissions Analysis

The source categories in Table 4-6 are those included in both the illustrative emissions analysis, which can be found in the cost memoranda and in the RIA, and this potential cost analysis. The net change in HAP emissions for these source categories that is expected from potential classifications is a decrease of 173 tons, with a decrease of 59 tons from the MON

⁴⁵ Federal Register. U.S. EPA, Federal Standards for Marine Tank Vessel Loading Operations and National Emission Standards for Hazardous Air Pollutants for Marine Tank Vessel Loading Operations. 60 FR 181. September 19, 1995. Available at <https://www.govinfo.gov/content/pkg/FR-1995-09-19/pdf/95-22725.pdf>.

⁴⁶ U.S. Federal Reserve Board, St. Louis. Gross Domestic Product (GDP implicit price deflator). Index: 2012-100. Annual Values. Available at <https://fred.stlouisfed.org/series/A191RD3A086NBEA>. Downloaded on April 23, 2020.

⁴⁷ ERG to Neil Feinberg, US EPA/OAQPS/SPPD. National Impacts of the 2020 Risk and Technology Review Final Rule for the Organic Liquids Distribution (Non-Gasoline) Source Category. March 5, 2020. The cost estimate we prepare here does not include enhanced monitoring for flares and removal of an exemption for control of transfer racks, for emission reductions were not estimated for these two control techniques due to lack of data.

⁴⁸ U.S. Federal Reserve Board, St. Louis. Gross Domestic Product (GDP implicit price deflator). Index: 2012-100. Annual Values. Available at <https://fred.stlouisfed.org/series/A191RD3A086NBEA>. Downloaded on February 19, 2020.

source category as the largest change in magnitude.⁴⁹ It is these emission reductions that are included in the analysis of potential control costs, calculated as those needed to meet the 75 percent MST (i.e., the primary scenario).

We then conduct an analysis to determine the annual cost to reduce emissions for the four source categories with potential emissions decreases under alternative scenario 2 according to the illustrative emissions analysis and having available HAP control technologies to achieve the emissions decreases. We use cost-effectiveness estimates to calculate a potential annual cost of control for reducing the emissions increases obtained by the illustrative emissions analysis for the four source categories that could experience them. The cost-effectiveness estimates are multiplied by the emissions change for each source category as indicated in Table 4-5 to obtain the potential annual cost of control for that source category. Table 4-7 shows the potential annual cost savings under the alternative scenario 2 in 2025 and beyond (the assumed time when all potential reclassifications have taken place), the potential annual cost of control, and net annual cost savings for each of these source categories.

Table 4-7. Potential Cost Impacts to HAP Source Categories with Sources Under ALTERNATIVE SCENARIO 2 and Having Available HAP Control Technologies or Techniques (2017\$)*

Source Category	Annual Cost, \$		
	Savings in 2025 and Beyond	Control	Net Savings
MON	8,053,774	2,160,502	5,809,272
Marine Tank Vessel Loadings	-37,180	806,700	- 843,820
OLD	1,612,570	53,240	1,559,330
Wood Furniture	1,903,678	571,965	1,331,713

*A minus sign denotes a negative number; no sign denotes a positive number. The net annual cost savings = annual cost savings in 2025 and beyond – annual control costs.

These results show that there are positive net annual cost savings for three of the four source categories applying control technologies as part of sources reclassifying from major HAP to area HAP sources. Thus, this illustrative cost analysis suggests there may be some positive return to sources in these categories that may choose to reclassify under alternative scenario 2, all things considered.

⁴⁹ U.S. EPA. Memorandum from Elineth Torres to Docket No. EPA-HQ-OAR-2019-0282. DRAFT Documentation of the emission impacts analysis for the final rulemaking “Reclassification of Major Sources as Area Sources under Section 112 of the Clean Air Act.” August 2020.

4.11 Limitations of This Analysis

This analysis of the alternative scenario 2 has three limitations that are important to mention. First, as we indicate earlier in this memo, the cost-effectiveness estimates derived for this analysis are likely to be overestimates of the potential cost of control that major HAP sources at the alternative scenario 2 would incur to reduce emissions for purposes of reclassifying to area source status for these estimates include capital costs, which may not be a factor in reclassification decisions according to the review of reclassified major sources done for this final action. Thus, the results of this “break-even” analysis may understate the potential for additional emission reductions for reclassification purposes by overstating the “break-even” costs for these source categories.

Second, we note that the extent of cost escalation in this analysis is often driven by the vintage of the cost data that is the basis for the cost-effectiveness estimates. The estimate of costs used for the wood furniture coatings category uses an escalation period is longer than five years. This is not consistent with the recommendation in the EPA Air Pollution Control Cost Manual that five years is the preferred duration for cost escalation.⁵⁰ Given the age of the cost data, however, we did not have an alternative to convert these costs into 2017 dollars.

Third, we acknowledge that the costs included in these estimates may not reflect true marginal costs for major sources in that they presume the average costs of control that serve as the basis for the cost-effectiveness estimates are suitable for “break-even” decision-making by major sources considering reclassification, while decisions by sources to reduce emissions will be made based on their marginal costs of control and production on the margin of their affordability. No marginal cost data is available for HAP control technologies or techniques applicable to the source categories included in this illustrative analysis.

⁵⁰ U.S. EPA. EPA Air Pollution Control Cost Manual. Section 1, Chapter 2. Cost Estimation: Costs and Methodology. February 1, 2018. Available at https://www.epa.gov/sites/production/files/2017-12/documents/epacmcostestimationmethodchapter_7thedition_2017.pdf. p. 19.

SECTION 5.

BENEFITS/DISBENEFITS

5.1 Introduction

This section describes the human health impacts associated with the final rule. This final rule may potentially result in both emission reductions and increases from a broad array of existing sources. As described in Section 4, pollutant emissions that may be affected by the rule include HAPs; VOCs, which are precursors to both PM_{2.5} and ozone; SO₂, which is a precursor to PM_{2.5}; NO_x, which is a precursor to both PM_{2.5} and ground-level ozone; organic HAP such as benzene, ethylbenzene, toluene, and vinyl chloride; and methane, a GHG and a precursor to ozone formation. As described in the subsequent sections, these pollutants are associated with substantial health effects, climate effects, and other welfare effects.

Although the illustrative emissions analysis suggests that there may be both emission increases and decreases from individual source categories, we are uncertain of the magnitude and geographic distribution of the changes in emissions across the broad array of sources resulting from this rulemaking, described more fully in Section 4. As such, we are unable to quantify the changes in emissions across these sources and can neither simulate the change in air quality nor characterize the impact of these changes. This is not to imply that changes in emissions will not affect human health or ecological welfare. Rather, our approach reflects the challenges associated with modeling the direct and indirect impacts of the reductions in emissions for these sectors with the data currently available.

In place of quantitative estimates of the economic value of the pollutant changes, we instead characterize these impacts in qualitative terms. In this section, we provide a qualitative assessment of the health benefits associated with altering exposure to these pollutants and the visibility impairment and ecosystem benefits.

5.2 PM_{2.5} Benefits/Disbenefits

This rulemaking may potentially alter directly emitted PM_{2.5} and/or precursors to PM_{2.5} including NO_x and SO₂. Changing these emissions would affect PM_{2.5} formation, human exposure to PM_{2.5}, and the incidence of PM_{2.5}-related health effects. Limits to data, resources, and methods prevented the EPA from estimating the health impacts and monetized benefits of the potentially altered PM_{2.5} concentrations resulting from this final rulemaking. However, we provide the qualitative discussion below for context regarding potential implications of the final rule.

5.2.1 *PM_{2.5} Health Effects*

Changing PM_{2.5} precursors and directly emitted PM_{2.5} would alter human exposure to PM_{2.5} and the incidence of PM_{2.5}-related health effects. Human health effects of PM_{2.5} exposure include mortality and cardiovascular morbidity (U.S. EPA, 20019). More specifically, researchers have associated PM_{2.5} exposure with adverse health effects in numerous toxicological, clinical, and epidemiological studies. These health effects include premature death; nonfatal heart attacks; irregular heartbeat; aggravated asthma; decreased lung function; and increased respiratory symptoms, such as irritation of the airways, coughing, and difficulty breathing (U.S. EPA, 2019). These health effects result in hospital and emergency room visits, lost workdays, and restricted activity days. When adequate data and resources are available, the EPA generally quantifies several health effects associated with exposure to PM_{2.5} (*e.g.*, U.S. EPA, 2019).

When the EPA quantifies PM_{2.5}-related benefits, the EPA assumes that all fine particles, regardless of their chemical composition, are equally potent in causing premature mortality because the scientific evidence is not yet sufficient to allow differentiation of effect estimates by particle type (U.S. EPA, 2019). Based on our review of the current body of scientific literature, the EPA estimates PM_{2.5}-related mortality without applying an assumed concentration threshold. This decision is supported by the data, which are quite consistent in showing effects down to the lowest measured levels of PM_{2.5} in the underlying epidemiology studies.

Several significant ecological effects are associated with the deposition of organic particles, including persistent organic pollutants, and polycyclic aromatic hydrocarbons (PAHs) (U.S. EPA, 2019). This summary is from Section 6.6.1 of the 2012 PM National Ambient Air Quality Standards (NAAQS) RIA (U.S. EPA, 2012b).

PAHs can accumulate in sediments and bioaccumulate in freshwater, flora, and fauna. The uptake of organics depends on the plant species, site of deposition, physical and chemical properties of the organic compound, and prevailing environmental conditions (U.S. EPA, 2019). PAHs can accumulate to high enough concentrations in some coastal environments to pose an environmental health threat that includes cancer in fish populations, toxicity to organisms living in the sediment, and risks to those (*e.g.*, migratory birds) that consume these organisms. Atmospheric deposition of particles is thought to be the major source of PAHs to the sediments of coastal areas of the United States. Deposition of PM to surfaces in urban settings increases the metal and organic component of storm water runoff. This atmospherically associated pollutant burden can then be toxic to aquatic biota. The contribution of atmospherically deposited PAHs to

aquatic food webs was demonstrated in high-elevation mountain lakes with no other anthropogenic contaminant sources.

The Western Airborne Contaminants Assessment Project is the most comprehensive database available on contaminant transport and the effects of PM deposition on sensitive ecosystems in the western United States. (Landers *et al.*, 2008). In this project, the transport, fate, and ecological impacts of anthropogenic contaminants from atmospheric sources were assessed from 2002 to 2007 in seven ecosystem components (air, snow, water, sediment, lichen, conifer needles, and fish) in eight core national parks. The study concluded that bioaccumulation of semivolatile organic compounds occurred throughout park ecosystems, that an elevational gradient in PM deposition exists with greater accumulation in higher altitude areas, and that contaminants accumulate in proximity to individual agriculture and industry sources, which is counter to the original working hypothesis that most of the contaminants would originate from Eastern Europe and Asia.

5.2.2 Visibility Effects

Altering directly emitted and secondarily formed PM_{2.5} could affect visibility throughout the United States. Fine particles with significant light-extinction efficiencies include sulfates, nitrates, organic carbon, elemental carbon, and soil (Sisler, 1996). Suspended particles and gases degrade visibility by scattering and absorbing light. Higher visibility impairment levels in the East are due to higher concentrations of fine particles, particularly sulfates, and higher average relative humidity levels. Visibility impairment has a direct impact on people's enjoyment of daily activities and their overall sense of well-being. Good visibility increases the quality of life where individuals live and work and where they engage in recreational activities. Previous analyses (U.S. EPA, 2006b; 2009a; 2011a; 2012b) show that visibility benefits are a significant welfare benefit category. However, without air quality modeling, we are unable to estimate visibility-related benefits or disbenefits, nor are we able to determine whether PM_{2.5} precursor emissions would likely have a significant impact on visibility in urban areas or Class I areas.

5.3 Ozone Effects

This rulemaking may potentially alter ground-level ozone concentrations. Ozone is not emitted directly into the air but is created when its two primary components, VOC and NO_x, react in the presence of sunlight. In urban areas, compounds representing all classes of VOCs and carbon monoxide are important compounds for ozone formation, but VOCs emitted from vegetation tend to be more important compounds in nonurban vegetated areas (U.S. EPA, 2020). Therefore, changing these emissions would impact ozone formation, human exposure to ozone,

and the incidence of ozone-related health effects. However, we have not quantified the ozone-related benefits in this analysis for several reasons. First, previous rules have shown that the monetized benefits associated with reducing ozone exposure are generally smaller than PM-related benefits, even when ozone is the pollutant targeted for control (U.S. EPA, 2010b; 2014a). Second, the complex nonlinear chemistry of ozone formation introduces uncertainty to the development and application of a benefit-per-ton estimate, particularly for sectors with substantial new growth.

Third, the impact of changing VOC emissions is spatially heterogeneous depending on local air chemistry. Urban areas with a high population concentration are often VOC limited, which means that ozone is most effectively reduced by lowering VOC emissions. Rural areas and downwind suburban areas are often NO_x limited, which means that ozone concentrations are most effectively reduced by lowering NO_x emissions rather than lowering VOC emissions. Between these areas, ozone is relatively insensitive to marginal changes in both NO_x and VOC.

Because of data limitations such as the location and number of sources affected by this rulemaking, we did not perform the air quality modeling for this rule needed to quantify the ozone benefits/disbenefits associated with reducing VOC emissions. Because of the high degree of variability in the responsiveness of ozone formation to VOC emission reductions and data limitations regarding the location of the emissions changes, we are unable to estimate the effect that changing VOC emissions will have on ambient ozone concentrations without air quality modeling.

5.3.1 Ozone Health Effects

Human exposure to ambient ozone concentrations is associated with adverse health benefits, including premature death and respiratory morbidity (U.S. EPA, 2010b). Researchers have associated ozone exposure with adverse health effects in numerous toxicological, clinical, and epidemiological studies (U.S. EPA, 2020). When adequate data and resources are available, the EPA generally quantifies several health effects associated with exposure to ozone (*e.g.*, U.S. EPA, 2010b; 2011a). These health effects include respiratory morbidity, such as asthma attacks; hospital and emergency department visits; lost school days and premature mortality. The scientific literature also suggests that exposure to ozone is associated with chronic respiratory damage and premature aging of the lungs.

5.3.2 Ozone Vegetation Effects

Exposure to ozone is associated with a wide array of vegetation and ecosystem effects in the published literature (U.S. EPA, 2020). Sensitivity to ozone is highly variable across species,

with over 66 vegetation species identified as “ozone-sensitive,” many of which are found in state and national parks and forests. These effects include those that damage or impair the intended use of the plant or ecosystem. Such effects are considered adverse to the public welfare and can include reduced growth and/or biomass production in sensitive trees, reduced yield and quality of crops, visible foliar injury, changes to species composition, and changes in ecosystems and associated ecosystem services.

5.3.3 Ozone Climate Effects

Ozone is a well-known short-lived climate-forcing GHG (U.S. EPA, 2006a). Stratospheric ozone (the upper ozone layer) is beneficial because it protects life on Earth from the sun’s harmful ultraviolet radiation. In contrast, tropospheric ozone (ozone in the lower atmosphere) is a harmful air pollutant that adversely affects human health and the environment and contributes significantly to regional and global climate change. Because of its short atmospheric lifetime, tropospheric ozone concentrations exhibit large spatial and temporal variability (U.S. EPA, 2009b). The Intergovernmental Panel on Climate Change Fifth Assessment Report estimated that the contribution to current warming levels of increased tropospheric ozone concentrations resulting from human methane, NO_x, and VOC emissions was 0.5 W/m², or about 30 percent as large a warming influence as elevated CO₂ concentrations (IPCC, 2014). This quantifiable influence of ground-level ozone on climate leads to increases in global surface temperature and changes in hydrological cycles.

5.4 NO₂ Health Effects

In addition to being a precursor to PM_{2.5} and ozone, NO_x emissions are linked to a variety of adverse health effects associated with direct exposure. Following a comprehensive review of health evidence from epidemiologic and laboratory studies, the *Integrated Science Assessment for Oxides of Nitrogen—Health Criteria* (NO_x ISA) (U.S. EPA, 2016) concluded that a causal relationship exists between respiratory health effects and short-term exposure to NO₂. These epidemiologic and experimental studies encompass several endpoints, including emergency department visits and hospitalizations, respiratory symptoms, airway hyper-responsiveness, airway inflammation, and lung function. The NO_x ISA also concluded that the relationship between short-term NO₂ exposure and premature mortality was “suggestive but not sufficient to infer a causal relationship” (U.S. EPA, 2016, page 5-343) because it is difficult to attribute the mortality risk effects to NO₂ alone. Although the NO_x ISA stated that studies consistently reported a relationship between NO₂ exposure and mortality, the effect was generally smaller than that for other pollutants such as PM. However, because of methodology and data

limitations, we were unable to estimate the health co-benefits/disbenefits associated with altered NO₂ emissions or exposure in this final rule.

5.5 SO₂ Health Effects

In addition to being a precursor to PM_{2.5}, SO₂ emissions are linked to a variety of adverse health effects associated with direct exposure. We were unable to estimate the health co-benefits associated with reduced SO₂ in this analysis. Therefore, this analysis only provides a qualitative discussion of the PM_{2.5} co-benefits associated with the reductions in SO₂ emissions.

Following an extensive evaluation of health evidence from epidemiologic and laboratory studies, the *Integrated Science Assessment for Oxides of Sulfur—Health Criteria* (SO₂ ISA) concluded that a causal relationship exists between respiratory health effects and short-term exposure to SO₂ (U.S. EPA, 2017). The immediate effect of SO₂ on the respiratory system in humans is bronchoconstriction. Asthmatics are more sensitive to the effects of SO₂ likely resulting from preexisting inflammation associated with this disease. A clear concentration-response relationship has been demonstrated in laboratory studies following exposures to SO₂ at concentrations between 20 and 100 ppb, both in terms of increasing severity of effect and percentage of asthmatics adversely affected. Based on our review of this information, we identified three short-term morbidity endpoints that the SO₂ ISA identified as a “causal relationship”: asthma exacerbation, respiratory-related emergency department visits, and respiratory-related hospitalizations. The differing evidence and associated strength of the evidence for these different effects are described in detail in the SO₂ ISA. The SO₂ ISA also concluded that the relationship between short-term SO₂ exposure and premature mortality was “suggestive of a causal relationship” (U.S. EPA, 2017, page 5-277) because it is difficult to attribute the mortality risk effects to SO₂ alone. Although the SO₂ ISA stated that studies are generally consistent in reporting a relationship between SO₂ exposure and mortality, the observed associations to adjustment for other pollutants lacked robustness. We did not quantify these co-benefits because of data constraints.

5.6 NO₂ and SO₂ Health Co-Benefits/Co-Disbenefits

As described in the *Integrated Science Assessment for Oxides of Nitrogen and Sulfur—Ecological Criteria* (NO_x/SO_x ISA) (U.S. EPA, 2008), SO₂ and NO_x emissions also contribute to a variety of adverse welfare effects, including those associated with acidic deposition, visibility impairment, and nutrient enrichment. Deposition of nitrogen causes acidification, which can cause a loss of biodiversity of fishes, zooplankton, and macroinvertebrates in aquatic ecosystems, as well as a decline in sensitive tree species, such as red spruce (*Picea rubens*) and

sugar maple (*Acer saccharum*) in terrestrial ecosystems. In the northeastern United States, the surface waters affected by acidification are a source of food for some recreational and subsistence fishermen and for other consumers and support several cultural services, including aesthetic and educational services and recreational fishing. Biological effects of acidification in terrestrial ecosystems are generally linked to aluminum toxicity, which can cause reduced root growth, restricting the ability of the plant to take up water and nutrients. These direct effects can, in turn, increase the sensitivity of these plants to stresses, such as droughts, cold temperatures, insect pests, and disease, leading to increased mortality of canopy trees. Terrestrial acidification affects several important ecological services, including declines in habitat for threatened and endangered species (cultural), declines in forest aesthetics (cultural), declines in forest productivity (provisioning), and increases in forest soil erosion and reductions in water retention (cultural and regulating) (U.S. EPA, 2008).

Deposition of nitrogen is also associated with aquatic and terrestrial nutrient enrichment. In estuarine waters, excess nutrient enrichment can lead to eutrophication. Eutrophication of estuaries can disrupt an important source of food production, particularly fish and shellfish production, and a variety of cultural ecosystem services, including water-based recreational and aesthetic services. Terrestrial nutrient enrichment is associated with changes in the types and number of species and biodiversity in terrestrial systems. Excessive nitrogen deposition upsets the balance between native and nonnative plants, changing the ability of an area to support biodiversity. When the composition of species changes, fire frequency and intensity can also change, as non-native grasses fuel more frequent and more intense wildfires (U.S. EPA, 2008).

Changes in emissions of NO₂ and SO₂ would impact the levels of visibility and increases in emissions would degrade the levels of visibility throughout the United States because these gases (and the particles of nitrate and sulfate formed from these gases) impair visibility by scattering and absorbing light (U.S. EPA, 2019). Visibility is also referred to as visual air quality, and it directly affects people's enjoyment of a variety of daily activities (U.S. EPA, 2019). Good visibility increases quality of life where individuals live and work and where they travel for recreational activities, including sites of unique public value, such as the Great Smoky Mountains National Park (U.S. EPA, 2019).

5.7 Hazardous Air Pollutant (HAP) Health Impacts

Because of methodology and resource limitations, we did not attempt to estimate the impacts associated with changes in emissions of HAP in this analysis. Instead, we provide a qualitative analysis of the health effects associated with the various HAP that may be affected by

this rule. The EPA remains committed to improving methods for estimating HAP benefits/disbenefits by continuing to explore additional concepts of benefits, including changes in the distribution of risk. The EPA's Science Advisory Board Health Effects Subcommittee concluded that "the challenges for assessing progress in health improvement as a result of reductions in emissions of HAP are daunting ... due to a lack of exposure-response functions, uncertainties in emissions inventories and background levels, the difficulty of extrapolating risk estimates to low doses and the challenges of tracking health progress for diseases, such as cancer, that have long latency "periods" (EPA-SAB, 2008, page i). In 2009, the EPA convened a workshop to address the inherent complexities, limitations, and uncertainties in current methods to quantify the benefits of reducing HAP. Recommendations from this workshop included identifying research priorities, focusing on susceptible and vulnerable populations, and improving dose-response relationships (Gwinn *et al.*, 2011).

In the subsequent sections, we describe the health effects associated with the main HAP of concern from the various sectors included in this rulemaking: benzene, ethylbenzene, toluene, and vinyl chloride. With the data available, it was not possible to estimate the tons of each individual HAP that would be reduced or increased in response to the final rule.

5.7.1 Benzene

The EPA's Integrated Risk Information System (IRIS) database lists benzene as a known human carcinogen (causing leukemia) by all routes of exposure and concludes that its exposure is associated with additional health effects, including genetic changes in both humans and animals, and increased proliferation of bone marrow cells in mice (U.S. EPA, 2000a; International Agency for Research on Cancer [IARC], 1982; Irons, Stillman, Colagiovanni, and Henry, 1992). The EPA states in its IRIS database that data indicate a causal relationship between benzene exposure and acute lymphocytic leukemia and suggest a relationship between benzene exposure and chronic nonlymphocytic leukemia and chronic lymphocytic leukemia. IARC has determined that benzene is a human carcinogen, and the U.S. Department of Health and Human Services has characterized benzene as a known human carcinogen (IARC, 1987; U.S. Department of Health and Human Services, 2016).

Several adverse non-cancer health effects, including blood disorders such as preleukemia and aplastic anemia, have also been associated with long-term exposure to benzene (Aksoy, 1989; Goldstein, 1988).

5.7.2 *Ethylbenzene*

Ethylbenzene is a major industrial chemical produced by alkylation of benzene. The pure chemical is used almost exclusively for styrene production. It is also a constituent of crude petroleum and is found in gasoline and diesel fuels. Acute (short-term) exposure to ethylbenzene in humans results in respiratory effects such as throat irritation and chest constriction, irritation of the eyes and neurological effects such as dizziness. Chronic (long-term) exposure of humans to ethylbenzene may cause eye and lung irritation, with possible adverse effects on the blood. Animal studies have reported effects on the blood, liver, kidneys and endocrine system from chronic inhalation exposure to ethylbenzene. No information is available on the developmental or reproductive effects of ethylbenzene in humans, but animal studies have reported developmental effects, including birth defects in animals exposed via inhalation.

Studies in rodents reported increases in the percentage of animals with tumors of the nasal and oral cavities in male and female rats exposed to ethylbenzene via the oral route (Maltoni, Conti, Giuliano, and Belpoggi, 1985; Maltoni, Ciliberti, Pinto, Soffritti, Belpoggi, and Menarini, 1997). The reports of these studies lacked detailed information on the incidence of specific tumors, statistical analysis, survival data, and information on historical controls; thus, the results of these studies were considered inconclusive by the IARC (2000) and the National Toxicology Program (NTP) (1999). The NTP (1999) carried out a chronic inhalation bioassay in mice and rats and found clear evidence of carcinogenic activity in male rats and some evidence in female rats, based on increased incidences of renal tubule adenoma or carcinoma in male rats and renal tubule adenoma in females. NTP (1999) also noted increases in the incidence of testicular adenoma in male rats. Increased incidences of lung alveolar/bronchiolar adenoma or carcinoma were observed in male mice and liver hepatocellular adenoma or carcinoma in female mice, which provided some evidence of carcinogenic activity in male and female mice (NTP, 1999). IARC (2000) classified ethylbenzene as Group 2B, possibly carcinogenic to humans, based on the NTP studies.

5.7.3 *Toluene*⁵¹

Under the 2005 Guidelines for Carcinogen Risk Assessment, there is inadequate information to assess the carcinogenic potential of toluene because studies of humans chronically exposed to toluene are inconclusive, and toluene was not carcinogenic in adequate inhalation cancer bioassays of rats and mice exposed for life (Chemical Industry Institute of Toxicology [CIIT], 1980; NTP, 1990; Huff, 2003). Increased incidences of mammary cancer and leukemia

⁵¹ All health effects language for this section came from U.S. EPA (2005).

were reported in a lifetime rat oral bioassay (Maltoni, Ciliberti, Pinto, *et al.*, 1997); however, this evidence was considered equivocal because cancers were observed at the low dose tested (500 mg/kg/day) but not at the higher dose tested (800 mg/kg/day). In support of the EPA's cancer classification, IARC has classified toluene as Group 3 (*not classifiable as to its carcinogenicity in humans*) with a supporting statement that there is inadequate evidence in humans and evidence suggesting a lack of carcinogenicity of toluene in experimental animals (IARC, 1999). The central nervous system (CNS) is the primary target for toluene toxicity in both humans and animals for acute and chronic exposures. CNS dysfunction (which is often reversible) and narcosis have been frequently observed in humans acutely exposed to low or moderate levels of toluene by inhalation; symptoms include fatigue, sleepiness, headaches, and nausea. CNS depression has been reported to occur in chronic solvent abusers exposed to high levels of toluene. Symptoms include ataxia; tremors; cerebral atrophy; nystagmus (involuntary eye movements); and impaired speech, hearing and vision. Chronic inhalation exposure of humans to toluene also causes irritation of the upper respiratory tract, eye irritation, dizziness, headaches, and difficulty with sleep.

Human studies have also reported developmental effects, such as CNS dysfunction, attention deficits, and minor craniofacial and limb anomalies, in the children of women who abused toluene during pregnancy. A substantial database exists that examines the effects of toluene in subchronic and chronic occupationally exposed humans exists. The weight of evidence from these studies indicates neurological effects (*i.e.*, impaired color vision, impaired hearing, decreased performance in neurobehavioral analysis, changes in motor and sensory nerve conduction velocity, headache, and dizziness) as the most sensitive endpoint.

5.7.4 Vinyl Chloride⁵²

Most vinyl chloride is used to make polyvinyl chloride (PVC) plastic and vinyl products. Acute (short-term) exposure to high levels of vinyl chloride in air has resulted in CNS effects, such as dizziness, drowsiness and headaches in humans. Chronic (long-term) exposure to vinyl chloride through inhalation and oral exposure in humans has resulted in liver damage. Cancer is a major concern from exposure to vinyl chloride via inhalation, because vinyl chloride exposure has been shown to increase the risk of a rare form of liver cancer in humans. The EPA (2000b) has classified vinyl chloride as a Group A human carcinogen. IARC (2000) has classified vinyl chloride as carcinogenic to humans (Group 1).

⁵² Source for this section is U.S. EPA (2000).

5.7.5 *Other Air Toxics*

In addition to the compounds described above, other air toxic compounds might be potentially affected by this rule. Information regarding the health effects of those compounds can be found in the EPA's IRIS database.

SECTION 6.

IMPACTS OF REGULATORY RELIEF

This final rulemaking should be viewed as regulatory relief for major sources of HAP that may be eligible to reclassify as area sources and choose to do so. This RIA illustrates the net administrative burden costs avoided as a result of this rule. The costs for state permitting authorities for the issuance of area source permits are also reported. To estimate the net avoided administrative costs, the EPA estimated the permitting costs to the facilities and the state agencies, the estimated annual compliance cost savings from not having to comply with major source NESHAP requirements, and the estimated costs of the area source rule requirements as mentioned earlier in this RIA.

The EPA also estimated the impacts of avoided cost to sales which are separate estimates from those of cost savings. The EPA estimated avoided cost-to-sales ratios by comparing the estimated net avoided cost per facility in the first and fifth years to industry average revenues per establishment. The EPA also estimated cost-to-sales ratios by comparing net avoided costs to revenues of establishments at different employment size categories. Small business impacts were estimated by computing avoided cost-to-sales ratios for small entities using establishment (facility)-level data given its availability.

6.1 Method for Analyzing Avoided Small Entity Impacts

The EPA used avoided cost-to-sales comparisons to evaluate the potential impacts to sources affected by this final rule. Because this regulatory action will provide regulatory relief, these avoided cost-to-sales ratios represent the potential impacts that may be avoided for facilities as a result of this final rule. For all regulatory actions, to comply with the Regulatory Flexibility Act (RFA) as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) the EPA must determine whether a rule will have a significant economic impact on a substantial number of small entities. This final rule will provide regulatory relief to affected sources that choose to reclassify and has positive and small negative impacts on small entities depending on the analysis year and NAICS code. Because this final rule is expected to yield no adverse impacts to small entities in year 1 (2021) and no adverse cost impacts to any small entities in year 5 (2025 - the year by which all reclassifications from major to area sources are assumed to have taken place) and beyond, the EPA is not required to provide a small entity analysis. However, the EPA has the discretion to do so. The approach for estimating the avoided economic impacts and the small entity analysis is the same for this analysis. The steps followed include gathering data to characterize the affected establishments by employment size categories,

selecting and describing the measures used in the analysis including cost-to-sales ratios for the affected sector categories.

If changes in compliance costs, which are key inputs to an economic impact analysis, are not substantial or are relatively trivial, the impact analysis could consist of a calculation of annual (or annualized) costs as a percent of sales for affected parent companies. This latter type of analysis is called a screening analysis and is applied when a partial equilibrium or more complex economic impact analysis approach is considered to be less appropriate given the expected limited size of the impacts and available information. Historically EPA has relied on this method due to data availability issues.

The analysis employed for this final rule is a “sales test” that computes the annualized compliance costs as a share of sales for each company. With the cost impact of this final rule being a savings in costs (and, thus, avoided costs), the “sales test” measures the avoided cost of compliance as a percentage of sales, whether for an affected industry or a company. In this analysis, data are available by establishment (a place of business) and industry, but not by company.

The “sales test” is the impact methodology the EPA employs in economic impact analysis such as this one as opposed to a “profits test,” in which annualized compliance costs are calculated as a share of profits.⁵³ This is because revenues or sales data are commonly available data for entities normally impacted by EPA regulations and profits data normally made available are often accounting but not the true economic profits earned by firms due to accounting and tax considerations. In addition, EPA would need to invoke further assumptions about cost pass through for both sales and profit tests.

While a “sales test” can provide some insight as to the economic impact of an action such as this one, it assumes that the impacts of a rule are solely incident on a directly affected firm (therefore, no impact to consumers of affected product), or solely incident on consumers of output directly affected by this action (therefore, no impact to companies that are producers of affected product). Thus, an analysis such as this one is best viewed as providing insight on the polar examples of economic impacts: maximum impact to either directly affected companies or their consumers. A “sales test” analysis does not consider shifts in supply and demand curves to reflect intermediate economic outcomes that are much more likely to occur than polar examples

⁵³ More information on sales and profit tests as used in analyses done by the EPA can be found at <http://www.epa.gov/sbrefa/documents/rfaguidance11-00-06.pdf>, pp. 32-33.

of impacts. Use of partial equilibrium or computable general equilibrium (CGE) economic impact models such as US EPA’s SAGE model will provide more robust analyses of economic impacts for regulatory actions as appropriate and if data and resources permit their use.⁵⁴ EPA recognizes that models such as SAGE will likely require more data but it also recognizes that the costs associated with data are decreasing. EPA also recognizes that a screening analysis such as a “sales test” provide limited insights in comparison to models such as SAGE. EPA will evaluate on a case-by-case basis in the near term the usefulness of SAGE vs. screening analysis tools such as “sales test” as the agency collects and refines data to operationalize more complete economic impact assessment tools in order to rely less on screening analysis tools. As stated in the 2017 Science Advisory Board’s guidance to US EPA on economy-wide modeling, “a prima facie case can be made for economy-wide modeling for policies with wide impacts” as long as the size of impacts are large relative to the precision of the model.”⁵⁵

6.1.1 Identifying Affected Sectors and Entities

The industrial, commercial, and other sectors covered by the final rule were identified during the development of the cost analysis for the rule. For these sectors, the affected sources are summarized with applicable six-digit NAICS codes in Tables 6-1 through 6-3.

6.1.2 Data Used to Characterize Affected Entities by Size

The Census Bureau’s 2012 Economic Census data provide national information on the distribution of economic variables by industry and size.⁵⁶ Specifically, the tables report data for each industry on the number of establishments (Table 6-1), employment (Table 6-2), and receipts (Table 6-3) by enterprise size category in affected sectors. The 2012 Economic Census definitions in these data elements are as follows:

- *Establishment:* An establishment is a single physical location where business is conducted and/or services are provided.

⁵⁴ U.S. EPA, 2019. SAGE stands for SAGE is an Applied General Equilibrium Model. Discussion and documentation of SAGE can be found at <https://www.epa.gov/environmental-economics/cge-modeling-regulatory-analysis>

⁵⁵ U.S. Environmental Protection Agency, Science Advisory Board (SAB). SAB Advice on the Use of Economy-Wide Models in Evaluating the Social Costs, Benefits, and Economic Impacts of Air Regulations. September 29, 2017. p. 34. Available on the Internet at [https://yosemite.epa.gov/sab/SABPRODUCT.NSF/0/4B3BAF6C9EA6F503852581AA0057D565/\\$File/EPA-SAB-17-012.pdf](https://yosemite.epa.gov/sab/SABPRODUCT.NSF/0/4B3BAF6C9EA6F503852581AA0057D565/$File/EPA-SAB-17-012.pdf).

⁵⁶ The 2012 Economic Census is the most recent version that is complete and publicly available. The 2017 Economic Census started being released in stages from September 2019 and will continue to be released until December 2021. Because all of the data for the 2017 Economic Census are not yet released, the EPA chose to use the complete datasets from the 2012 Economic Census. See <https://www.census.gov/programs-surveys/economic-census/news-updates/releases.html> for more details.

- *Employment*: Employment includes all employees at the establishment who worked or received pay for the part of the pay period including the 12th of the specified months (March, June, September, and December). Included are employees on paid sick leave, paid holidays, and paid vacations; not included are proprietors and partners of unincorporated businesses.
- Receipts (varies by NAICS code):
 - *Revenue*: This includes revenue from all business activities whether or not payment was received in the census year (excluding sales and other taxes collected from customers and paid directly to a local, state, or federal agency). (NAICS 22, NAICS 48–49)
 - *Revenue*: This includes revenue from all business activities whether or not payment was received in the census year, including commissions and fees from all sources, rents, net investment income, interest, dividends, and royalties. Revenue from leasing property marketed under operating leases is included. It also includes the total value of service contracts, amounts received for work subcontracted to others, and rents from real property sublet to others. It does not include sales and other taxes collected from customers and paid directly by the firm to a local, state, or federal tax agency. (NAICS 53)
 - *Total value of shipments and receipts for services*: This item covers the received or receivable net selling values, f.o.b. plant (exclusive of freight and taxes), of all products shipped, both primary and secondary, as well as all miscellaneous receipts. (NAICS 21, NAICS 31–33)
 - *Receipts*: This includes gross receipts from customers or clients for services provided, from the use of facilities, and from merchandise sold in the census year, whether or not payment was received in the census year and are net after deductions for refunds and allowances for merchandise returned by customers. It excludes sales and other taxes collected directly from customers and paid directly to a local, state, or federal tax agency. (NAICS 56)
 - *Receipts/revenue*: This includes gross receipts/revenue from customers or clients for services provided, from the use of facilities, and from merchandise sold in the census year, whether or not payment was received in the census year. Includes amounts received from the rental and leasing of vehicles, equipment, instruments, and tools; the total value of service contracts; market value of compensation received in lieu of cash; amounts received for work subcontracted to others; and dues and assessments from members and affiliates. Receipts/revenue from services performed for foreign parent firms, subsidiaries, and branches included. (NAICS 54, NAICS 71, NAICS 81)
 - *Sales*: This includes merchandise sold for cash or credit by establishments primarily engaged in wholesale trade. Net after reductions for refunds and allowances for merchandise returned by customers. Do not include carrying or other credit charges; sales and other taxes collected from customers and

forwarded to taxing authorities; and non-operating income from such sources as investments, rental or sales of real estate, and interest. (NAICS 41)

- *Enterprise:* An enterprise is a business organization consisting of one or more domestic establishments that were specified under common ownership or control. The enterprise and the establishment are the same for single-establishment firms. Each multi-establishment company forms one enterprise—the enterprise employment and annual payroll are summed from the associated establishments. Enterprise size designations are determined by the summed employment of all associated establishments.

The Small Business Administration (SBA) small business size standard(s) is provided for each industry group to facilitate comparisons. Our analysis is focused on the establishment level instead of the firm level because the 2012 Economic Census did not sufficiently report the relevant data for firm employment size categories. Most but not all establishment employment size categories were available for number of establishments, employment, and receipts. The receipt data are reported in 2012 dollars. Therefore, to adjust receipt data for comparison to costs estimated in 2017 dollars, the EPA used the St. Louis Federal Reserve's Gross Domestic Product Implicit Price Deflator to adjust 2012 dollars to 2017 dollars.

All receipt and other industry data used in the economic impact analysis can be found in the Final MM2ARIA datasheet August_2020.xls, a spreadsheet that is available in the docket for this rulemaking.

Table 6-1. Number of Establishments by Industry and Enterprise Size: 2012

Sector	NAICS Descriptions	NAICS	SBA Size Standards (2017)	Number of Establishments by Employee Size Categories						
				Total	≤19	20~99	100~499	500~999	1000~2499	≥2500
Agriculture	Postharvest Crop Activities (except Cotton Ginning)	115114	\$27.5 million	1,062	696	283	78	1		
Energy	Crude Petroleum and Natural Gas Extraction	211111	1250 (Feb 2016 Size Standards)	6,398	5,306	815	234	25	15	3
Energy	Natural Gas Liquid Extraction	211112	750 (Feb 2016 Size Standards)	337	104	110	28	5		
Industrial	Iron Ore Mining	212210	750	21	5	3	3	4		
Industrial	Lead Ore and Zinc Ore Mining	212231	750 (Feb 2016 Size Standards)	16	3		5			
Industrial	Copper Ore and Nickel Ore Mining	212234	1500 (Feb 2016 Size Standards)	39	8	5	11	7		3
Industrial	All Other Metal Ore Mining	212299	750	26	9		7			
Industrial	Industrial Sand Mining	212322	500	140	44	62	5			
Industrial	Kaolin and Ball Clay Mining	212324	750	30	3	15	6			
Industrial	Potash, Soda, and Borate Mineral Mining	212391	750	25	5			5		
Industrial	All Other Nonmetallic Mineral Mining	212399	500	171	60	43				
Energy	Support Activities for Oil and Gas Operations	213112	\$38.5 million	9,659	2,895	2,213	573	47	15	4
Utilities	Hydroelectric Power Generation	221111	500	405	342	48	0			
Utilities	Fossil Fuel Electric Power Generation	221112	750	1,416	674	466	227			
Utilities	Biomass Electric Power Generation	221117	250	107	69	29	0			
Utilities	Other Electric Power Generation	221118	250	18	14	4	0			
Utilities	Other Electric Power Generation^	221119	4 million MWH (2007 Size Standards)	716						
Utilities	Electric Power Distribution	221122	1,000	7,402	4,157	2,420	616			
Utilities	Natural Gas Distribution	221210	1,000	2,419	1,564	589	188			
Utilities	Water Supply and Irrigation Systems	221310	\$27.5 million	4,039	3,496	292	43			
Utilities	Sewage Treatment Facilities	221320	\$20.5 million	712	597	74	3			
Utilities	Steam and Air-Conditioning Supply	221330	\$15 million	95	50	42	0			
Industrial	Other Animal Food Manufacturing	311119	500	1,391	921	446	23	1		
Industrial	Wet Corn Milling	311221	1,250	64	24	23	15	2		
Industrial	Soybean Processing^	311222	500 (2007 Size Standards)	108						
Industrial	Other Oilseed Processing^	311223	1000 (2007 Size Standards)	42						
Industrial	Soybean and Other Oilseed Processing	311224	1,000	150	55	74	21			
Industrial	Fats and Oils Refining and Blending	311225	1,000	126	55	37	34			
Industrial	Beet Sugar Manufacturing	311313	750	31	1	10	16	4		
Industrial	Cane Sugar Manufacturing	311314	1,000	47	14	12	19	2		
Industrial	Frozen Fruit, Juice, and Vegetable Manufacturing	311411	1,000	220	59	63	82	15	1	
Industrial	Fruit and Vegetable Canning	311421	1,000	690	380	161	134	14	1	
Industrial	Specialty Canning	311422	1,250	112	65	20	19	7	1	
Industrial	Cheese Manufacturing	311513	1,250	541	251	156	121	10	3	
Industrial	Dry, Condensed, and Evaporated Dairy Product Manufacturing	311514	750	194	64	82	45	3		

(continued)

Table 6-1. Number of Establishments by Industry and Enterprise Size: 2012 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standards (2017)	Total	Number of Establishments by Employee Size Categories					
					≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Rendering and Meat Byproduct Processing	311613	750	213	89	97	27			
Industrial	Commercial Bakeries	311812	1,000	2,672	1,819	517	316	19		1
Industrial	Other Snack Food Manufacturing	311919	1,250	374	203	89	76	5	1	
Industrial	Coffee and Tea Manufacturing	311920	750	449	338	72	36	2	1	
Industrial	Flavoring Syrup and Concentrate Manufacturing	311930	1,000	146	81	42	23			
Industrial	Spice and Extract Manufacturing	311942	500	373	219	104	47	3		
Industrial	All Other Miscellaneous Food Manufacturing	311999	500	604	401	147	48	7	1	
Industrial	Breweries	312120	1,250	874	707	120	28	18	1	
Industrial	Distilleries	312140	1,000	251	200	29	22			
Industrial	Tobacco Manufacturing	312230	1,500	114	53	30	25	3	3	
Industrial	Yarn Spinning Mills^	313111	500 (2007 Size Standards)	188						
Industrial	Thread Mills^	313113	500 (2007 Size Standards)	46						
Industrial	Broadwoven Fabric Mills	313210	1,000	328	214	57	51	5	1	
Industrial	Narrow Fabric Mills^	313221	500 (2007 Size Standards)	148						
Industrial	Textile and Fabric Finishing Mills	313310	1,000	869	652	162	53	2		
Industrial	Broadwoven Fabric Finishing Mills^	313311	1000 (2007 Size Standards)	509						
Industrial	Fabric Coating Mills	313320	1,000	183	100	67	16			
Industrial	Tire Cord and Tire Fabric Mills^	314992	1000 (2007 Size Standards)	10						
Industrial	Leather and Hide Tanning and Finishing	316110	500	198	158	29	11			
Industrial	Sawmills	321113	500	2,928	2,154	606	168			
Industrial	Wood Preservation	321114	500	421	295	117	9			
Industrial	Hardwood Veneer and Plywood Manufacturing	321211	500	240	126	71	43			
Industrial	Softwood Veneer and Plywood Manufacturing	321212	1,250	100	32	28	35	5		
Industrial	Engineered Wood Member (except Truss) Manufacturing	321213	750	107	69	33	5			
Industrial	Reconstituted Wood Product Manufacturing	321219	750	218	82	77	59			
Industrial	Wood Window and Door Manufacturing	321911	1,000	1,139	768	267	95	4	5	
Industrial	Cut Stock, Resawing Lumber, and Planing	321912	500	989	637	307	44	1		
Industrial	All Other Miscellaneous Wood Product Manufacturing	321999	500	1,752	1,404	323	25			
Industrial	Pulp Mills	322110	750	32	4	6	18	4		
Industrial	Paper (except Newsprint) Mills	322121	1,250	166	14	35	73	33	11	
Industrial	Newsprint Mills	322122	750	17	1	3	12	1		
Industrial	Paperboard Mills	322130	1,250	156	9	54	76	16	1	
Industrial	Corrugated and Solid Fiber Box Manufacturing	322211	1,250	1,264	450	503	311			

(continued)

Table 6-1. Number of Establishments by Industry and Enterprise Size: 2012 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standards (2017)	Number of Establishments by Employee Size Categories						
				Total	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Paper Bag and Coated and Treated Paper Manufacturing	322220	750	816	378	280	152	5	1	
Industrial	Coated and Laminated Paper Manufacturing^	322222	500 (2007 Size Standards)	463						
Industrial	Sanitary Paper Product Manufacturing	322291	1,500	142	47	43	42	9	1	
Industrial	All Other Converted Paper Product Manufacturing	322299	500	521	296	184	40	1		
Industrial	Commercial Lithographic Printing^	323110	500 (2007 Size Standards)	10,464						
Industrial	Commercial Printing (except Screen and Books)	323111	500	20,847	17,281	2,865	660	37	4	
Industrial	Books Printing	323117	1,250	476	330	79	59	6	2	
Industrial	Petroleum Refineries	324110	1,500	158	23	18	68	37	12	
Industrial	Asphalt Shingle and Coating Materials Manufacturing	324122	750	223	114	83	26			
Industrial	All Other Petroleum and Coal Products Manufacturing	324199	500	110	70	30	10			
Industrial	Petrochemical Manufacturing	325110	1,000	55	16	15	20	4		
Industrial	Industrial Gas Manufacturing	325120	1,000	451	315	126	9	1		
Industrial	Synthetic Dye and Pigment Manufacturing	325130	1,000	158	83	48	25	2		
Industrial	Inorganic Dye and Pigment Manufacturing^	325131	1000 (2007 Size Standards)	80						
Industrial	Synthetic Organic Dye and Pigment Manufacturing^	325132	750 (2007 Size Standards)	78						
Industrial	Other Basic Inorganic Chemical Manufacturing	325180	1,000	645	336	220	78	7	4	
Industrial	Alkalies and Chlorine Manufacturing^	325181	1000 (2007 Size Standards)	53						
Industrial	Carbon Black Manufacturing^	325182	500 (2007 Size Standards)	28						
Industrial	All Other Basic Inorganic Chemical Manufacturing^	325188	1000 (2007 Size Standards)	564						
Industrial	Cyclic Crude and Intermediate Manufacturing^	325192	750 (2007 Size Standards)	28						
Industrial	Ethyl Alcohol Manufacturing	325193	1,000	222	43	169	10			
Industrial	Cyclic Crude, Intermediate, and Gum and Wood Chemical Manufacturing	325194	1,250	86	42	25	18	1		
Industrial	All Other Basic Organic Chemical Manufacturing	325199	1,250	865	440	282	119	20	3	1
Industrial	Plastics Material and Resin Manufacturing	325211	1,250	1,144	498	511	123	5	6	1
Industrial	Synthetic Rubber Manufacturing	325212	1,000	147	75	54	18			
Industrial	Artificial and Synthetic Fibers and Filaments Manufacturing	325220	1,000	124	49	33	37	4	1	

(continued)

Table 6-1. Number of Establishments by Industry and Enterprise Size: 2012 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standards (2017)	Number of Establishments by Employee Size Categories						
				Total	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Cellulosic Organic Fiber Manufacturing^	325221	1000 (2007 Size Standards)	11						
Industrial	Noncellulosic Organic Fiber Manufacturing^	325222	1000 (2007 Size Standards)	113						
Industrial	Nitrogenous Fertilizer Manufacturing	325311	1,000	189	123	50	16			
Industrial	Phosphatic Fertilizer Manufacturing	325312	750	78	45	18	12	2	1	
Industrial	Pesticide and Other Agricultural Chemical Manufacturing	325320	1,000	210	126	50	31	2	1	
Industrial	Medicinal and Botanical Manufacturing	325411	1,000	427	245	110	61	8	3	
Industrial	Pharmaceutical Preparation Manufacturing	325412	1,250	1,165	623	295	194	35	12	6
Industrial	Biological Product (except Diagnostic) Manufacturing	325414	1,250	321	150	97	52	15	6	1
Industrial	Paint and Coating Manufacturing	325510	1,000	1,162	762	312	84	4		
Industrial	Adhesive Manufacturing	325520	500	543	292	202	49			
Industrial	Surface Active Agent Manufacturing	325613	750	145	81	50	13	1		
Industrial	Toilet Preparation Manufacturing	325620	1,250	907	597	189	103	15	3	
Industrial	Explosives Manufacturing	325920	750	77	36	21	19	1		
Industrial	Custom Compounding of Purchased Resins	325991	500	452	243	171	37	1		
Industrial	Photographic Film, Paper, Plate, and Chemical Manufacturing	325992	1,500	320	253	43	20	1	2	1
Industrial	All Other Miscellaneous Chemical Product and Preparation Manufacturing	325998	500	1,163	803	275	80	5		
Industrial	Plastics Packaging Film and Sheet (including Laminated) Manufacturing	326112	1,000	401	118	184	93	5	1	
Industrial	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing	326113	750	590	268	203	113	5	1	
Industrial	Unlaminated Plastics Profile Shape Manufacturing	326121	500	406	208	136	61	1		
Industrial	Plastics Pipe and Pipe Fitting Manufacturing	326122	750	474	192	240	42			
Industrial	Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing	326130	500	240	147	64	25	4		
Industrial	Polystyrene Foam Product Manufacturing	326140	1,000	429	184	183	57	4	1	
Industrial	Urethane and Other Foam Product (except Polystyrene) Manufacturing	326150	750	650	274	299	76	1		
Industrial	Plastics Plumbing Fixture Manufacturing	326191	750	394	243	115	36			
Industrial	All Other Plastics Product Manufacturing	326199	750	6,464	3,522	1,995	898	40	9	

(continued)

Table 6-1. Number of Establishments by Industry and Enterprise Size: 2012 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standards (2017)	Number of Establishments by Employee Size Categories						
				Total	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Tire Manufacturing (except Retreading)	326211	1,500	111	44	22	18	10	16	1
Industrial	Rubber and Plastics Hoses and Belting Manufacturing	326220	750	256	123	78	51	4		
Industrial	Rubber Product Manufacturing for Mechanical Use	326291	750	455	215	152	83	5		
Industrial	All Other Rubber Product Manufacturing	326299	500	701	379	243	76	2	1	
Industrial	Pottery, Ceramics, and Plumbing Fixture Manufacturing	327110	1,000	669	558	82	26	2	1	
Industrial	Clay Building Material and Refractories Manufacturing	327120	750	574	278	250	46			
Industrial	Clay Refractory Manufacturing^	327124	500 (2007 Size Standards)	138						
Industrial	Flat Glass Manufacturing	327211	1,000	62	14	15	32	1		
Industrial	Other Pressed and Blown Glass and Glassware Manufacturing	327212	1,250	440	350	55	29	4	2	
Industrial	Cement Manufacturing	327310	1,000	241	134	50	57			
Industrial	Lime Manufacturing	327410	750	94	43	36	14	1		
Industrial	Gypsum Product Manufacturing	327420	1,500	216	124	70	22			
Industrial	Abrasive Product Manufacturing	327910	750	303	177	103	20	3		
Industrial	Mineral Wool Manufacturing	327993	1,500	271	163	68	38	2		
Industrial	All Other Miscellaneous Nonmetallic Mineral Product Manufacturing	327999	500	458	295	144	19			
Industrial	Iron and Steel Mills and Ferroalloy Manufacturing	331110	1,500	406	75	161	123	26	17	4
Industrial	Iron and Steel Mills^	331111	1000 (2007 Size Standards)	380						
Industrial	Electrometallurgical Ferroalloy Product Manufacturing^	331112	750 (2007 Size Standards)	26						
Industrial	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel	331210	1,000	206	37	90	70	6	3	
Industrial	Rolled Steel Shape Manufacturing	331221	1,000	180	99	63	17	1		
Industrial	Primary Aluminum Production^	331312	1000 (2007 Size Standards)	26						
Industrial	Alumina Refining and Primary Aluminum Production	331313	1,000	45	12	17	9	7		
Industrial	Secondary Smelting and Alloying of Aluminum	331314	750	115	40	61	14			
Industrial	Aluminum Sheet, Plate, and Foil Manufacturing	331315	1,250	104	52	18	22	10	2	
Industrial	Aluminum Extruded Product Manufacturing^	331316	750 (2007 Size Standards)	212						
Industrial	Other Aluminum Rolling, Drawing, and Extruding	331318	750	275	100	85	86	4		
Industrial	Nonferrous Metal (except Aluminum) Smelting and Refining	331410	1,000	207	130	48	24	5		

(continued)

Table 6-1. Number of Establishments by Industry and Enterprise Size: 2012 (continued)

				Number of Establishments by Employee Size Categories						
Sector	NAICS Descriptions	NAICS	SBA Size Standards (2017)	Total	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Primary Smelting and Refining of Copper^	331411	1000 (2007 Size Standards)	12						
Industrial	Primary Smelting and Refining of Nonferrous Metal (except Copper and Aluminum)^	331419	750 (2007 Size Standards)	195						
Industrial	Copper Rolling, Drawing, Extruding, and Alloying	331420	1,000	252	86	103	59	3	1	
Industrial	Copper Wire (except Mechanical) Drawing^	331422	1000 (2007 Size Standards)	129						
Industrial	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, and Extruding	331491	750	310	183	85	35	6		
Industrial	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	331492	750	260	146	86	27	1		
Industrial	Iron Foundries	331511	1,000	401	152	137	101	10	1	
Industrial	Steel Foundries (except Investment)	331513	500	208	97	65	41	4	1	
Industrial	Aluminum Die-Casting Foundries^	331521	500 (2007 Size Standards)	299						
Industrial	Aluminum Foundries (except Die-Casting)	331524	500	424	259	121	44			
Industrial	Nonferrous Forging	332112	750	61	24	18	15	4		
Industrial	Metal Crown, Closure, and Other Metal Stamping (except Automotive)	332119	500	1,501	823	557	117	4		
Industrial	Hand and Edge Tool Manufacturing^	332212	500 (2007 Size Standards)	900						
Industrial	Prefabricated Metal Building and Component Manufacturing	332311	750	643	420	160	62	1		
Industrial	Fabricated Structural Metal Manufacturing	332312	500	3,081	1,997	909	170	3	2	
Industrial	Metal Window and Door Manufacturing	332321	750	1,081	665	301	104	9	2	
Industrial	Sheet Metal Work Manufacturing	332322	500	4,120	2,797	1,139	181	2	1	
Industrial	Metal Can Manufacturing	332431	1,500	173	39	50	84			
Industrial	Other Metal Container Manufacturing	332439	500	342	204	112	23	3		
Industrial	Bolt, Nut, Screw, Rivet, and Washer Manufacturing	332722	500	826	462	264	96	4		
Industrial	Metal Heat Treating	332811	750	815	480	304	30	1		
Industrial	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers	332812	500	2,527	1,814	643	70			
Industrial	Electroplating, Plating, Polishing, Anodizing, and Coloring	332813	500	2,429	1,687	656	84	2		
Industrial	Other Fabricated Metal Manufacturing	332990	NA							
Industrial	Small Arms Ammunition Manufacturing	332992	1,250	111	87	12	6	2	3	1

(continued)

Table 6-1. Number of Establishments by Industry and Enterprise Size: 2012 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standards (2017)	Number of Establishments by Employee Size Categories						
				Total	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Ammunition (except Small Arms) Manufacturing	332993	1,500	55	28	7	15	4		1
Industrial	All Other Miscellaneous Fabricated Metal Product Manufacturing	332999	750	3,737	2,864	738	131	4		
Industrial	Farm Machinery and Equipment Manufacturing	333111	1,250	1,124	724	283	94	14	7	2
Industrial	Lawn and Garden Tractor and Home Lawn and Garden Equipment Manufacturing	333112	1,500	155	103	27	14	8	3	
Industrial	Construction Machinery Manufacturing	333120	1,250	781	412	259	84	15	10	1
Industrial	Mining Machinery and Equipment Manufacturing	333131	500	298	155	104	36	1	2	
Industrial	Printing Machinery and Equipment Manufacturing^	333293	500 (2007 Size Standards)	350						
Industrial	Photographic and Photocopying Equipment Manufacturing	333316	1,000	225	168	48	9			
Industrial	Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing	333415	1,250	886	438	236	177	22	13	
Industrial	Machine Tool (Metal Cutting Types) Manufacturing^	333512	500 (2007 Size Standards)	331						
Industrial	Machine Tool (Metal Forming Types) Manufacturing^	333513	500 (2007 Size Standards)	162						
Industrial	Turbine and Turbine Generator Set Units Manufacturing	333611	1,500	183	29	80	54	12	6	2
Industrial	Other Engine Equipment Manufacturing	333618	1,500	331	168	74	68	15	6	
Industrial	Overhead Traveling Crane, Hoist, and Monorail System Manufacturing	333923	1,250	291	167	86	34	2	2	
Industrial	Welding and Soldering Equipment Manufacturing	333992	1,250	342	237	78	23		4	
Industrial	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	334220	1,250	841	530	205	84	9	7	6
Industrial	Electron Tube Manufacturing^	334411	750 (2007 Size Standards)	83						
Industrial	Bare Printed Circuit Board Manufacturing	334412	750	562	320	177	62	3		
Industrial	Semiconductor and Related Device Manufacturing	334413	1,250	862	562	155	97	29	13	6
Industrial	Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use	334512	500	295	197	73	21	3	1	

(continued)

Table 6-1. Number of Establishments by Industry and Enterprise Size: 2012 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standards (2017)	Number of Establishments by Employee Size Categories						
				Total	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Blank Magnetic and Optical Recording Media Manufacturing	334613	1,000	76	64	11		1		
Industrial	Electric Lamp Bulb and Part Manufacturing	335110	1,250	67	28	17	20	2		
Industrial	Household Laundry Equipment Manufacturing	335224	1,250	4		1		1	1	1
Industrial	Other Major Household Appliance Manufacturing	335228	1,000	25	9	6	1	7	2	
Industrial	Power, Distribution, and Specialty Transformer Manufacturing	335311	750	259	137	74	43	4	1	
Industrial	Motor and Generator Manufacturing	335312	1,250	469	258	129	74	6	2	
Industrial	Storage Battery Manufacturing	335911	1,250	133	52	27	50	3		1
Industrial	Current-Carrying Wiring Device Manufacturing	335931	500	418	203	141	68	5	1	
Industrial	Noncurrent-Carrying Wiring Device Manufacturing	335932	1,000	167	78	44	42	1	2	
Industrial	Carbon and Graphite Product Manufacturing	335991	750	155	78	46	30	1		
Industrial	Automobile Manufacturing	336111	1,500	185	135	18	7	2	11	12
Industrial	Light Truck and Utility Vehicle Manufacturing	336112	1,500	78	45	9	3	3	7	11
Industrial	Heavy Duty Truck Manufacturing	336120	1,500	84	36	14	17	7	9	1
Industrial	Motor Vehicle Body Manufacturing	336211	1,000	754	406	245	91	11	1	
Industrial	Truck Trailer Manufacturing	336212	1,000	419	223	130	56	8	2	
Industrial	Motor Vehicle Gasoline Engine and Engine Parts Manufacturing	336310	1,000	845	619	112	88	23	3	
Industrial	Carburetor, Piston, Piston Ring, and Valve Manufacturing^	336311	500 (2007 Size Standards)	107						
Industrial	Gasoline Engine and Engine Parts Manufacturing^	336312	750 (2007 Size Standards)	738						
Industrial	Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing	336330	1,000	249	128	46	62	10	2	1
Industrial	Motor Vehicle Brake System Manufacturing	336340	1,250	194	84	42	60	6	2	
Industrial	Motor Vehicle Transmission and Power Train Parts Manufacturing	336350	1,500	510	263	112	110	14	10	1
Industrial	Motor Vehicle Seating and Interior Trim Manufacturing	336360	1,500	403	179	89	111	22	2	
Industrial	Motor Vehicle Metal Stamping	336370	1,000	775	249	304	189	25	8	
Industrial	Other Motor Vehicle Parts Manufacturing	336390	1,000	1,521	884	325	262	42	8	

(continued)

Table 6-1. Number of Establishments by Industry and Enterprise Size: 2012 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standards (2017)	Number of Establishments by Employee Size Categories						
				Total	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	All Other Motor Vehicle Parts Manufacturing^	336399	750 (2007 Size Standards)	1,448						
Industrial	Aircraft Manufacturing	336411	1,500	288	155	52	46	10	9	16
Industrial	Aircraft Engine and Engine Parts Manufacturing	336412	1,500	468	204	120	121	13	6	4
Industrial	Other Aircraft Parts and Auxiliary Equipment Manufacturing	336413	1,250	886	505	199	144	25	7	6
Industrial	Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing	336415	1,250	28	4	5	10	4	5	
Industrial	Railroad Rolling Stock Manufacturing	336510	1,500	237	100	81	43	10	2	1
Industrial	Ship Building and Repairing	336611	1,250	697	414	172	82	17	5	7
Industrial	Boat Building	336612	1,000	884	655	152	72	4	1	
Industrial	Military Armored Vehicle, Tank, and Tank Component Manufacturing	336992	1,500	43	7	15	14	5	2	
Industrial	Wood Kitchen Cabinet and Countertop Manufacturing	337110	750	6,839	6,211	516	98	12	2	
Industrial	Upholstered Household Furniture Manufacturing	337121	1,000	1,229	925	195	83	20	5	1
Industrial	Nonupholstered Wood Household Furniture Manufacturing	337122	750	2,425	2,184	186	50	3	2	
Industrial	Institutional Furniture Manufacturing	337127	500	718	423	221	73	1		
Industrial	Wood Office Furniture Manufacturing	337211	1,000	378	275	68	32	3		
Industrial	Office Furniture (except Wood) Manufacturing	337214	1,000	252	138	62	45	4	2	1
Industrial	Showcase, Partition, Shelving, and Locker Manufacturing	337215	500	1,100	744	268	84	4		
Industrial	Blind and Shade Manufacturing	337920	1,000	357	273	58	23	3		
Industrial	Surgical and Medical Instrument Manufacturing	339112	1,000	1,337	787	296	212	28	13	1
Industrial	Surgical Appliance and Supplies Manufacturing	339113	750	2,079	1,475	406	171	12	12	3
Industrial	Jewelry and Silverware Manufacturing	339910	500	2,050	1,809	203	34	2	2	
Industrial	Sporting and Athletic Goods Manufacturing	339920	750	1,629	1,312	246	64	4	3	
Industrial	Office Supplies (except Paper) Manufacturing	339940	750	521	416	82	22	1		
Industrial	Gasket, Packing, and Sealing Device Manufacturing	339991	500	567	319	176	66	5	1	
Industrial	Burial Casket Manufacturing	339995	1,000	110	81	21	7	1		
Industrial	All Other Miscellaneous Manufacturing	339999	500	6,292	5,817	419	51	3	2	
Commercial	Grain and Field Bean Merchant Wholesalers	424510	200	4,889	4,036	549				

(continued)

Table 6-1. Number of Establishments by Industry and Enterprise Size: 2012 (continued)

				Number of Establishments by Employee Size Categories						
Sector	NAICS Descriptions	NAICS	SBA Size Standards (2017)	Total	≤19	20~99	100~499	500~999	1000~2499	≥2500
Commercial	Petroleum Bulk Stations and Terminals	424710	200	4,305	3,231	858				
Commercial	Scheduled Passenger Air Transportation	481111	1,500	2,231	1,022	636				
Commercial	Line-Haul Railroads	482111	1,500							
Energy	Pipeline Transportation of Crude Oil	486110	1,500	658	503	129				
Energy	Pipeline Transportation of Natural Gas	486210	\$27.5 million	2,118	1,717	232				
Energy	Pipeline Transportation of Refined Petroleum Products	486910	1,500	580	496	65				
Commercial	Support Activities for Rail Transportation	488210	\$15 million	1,275	847	308				
Commercial	Marine Cargo Handling	488320	\$38.5 million	460	217	129				
Commercial	General Warehousing and Storage	493110	\$27.5 million	10,243	5,679	2,660				
Commercial	Other Warehousing and Storage	493190	\$27.5 million	2,505	1,764	482				
Commercial	Lessors of Nonresidential Buildings (except Miniwarehouses)	531120	\$27.5 million	34,551	27,668	1,146				
Commercial	Testing Laboratories	541380	\$15 million	6,613	4,623	1,255				
Commercial	Research and Development in the Physical, Engineering and Life Sciences (except Nanotechnology and Biotechnology)^^	541715	1,000							
Commercial	All Other Support Services	561990	\$11 million	12,940	9,657	1,334				
Waste Treatment and Disposal	Hazardous Waste Treatment and Disposal	562211	\$38.5 million	849	527	203				
Waste Treatment and Disposal	Solid Waste Landfill	562212	\$38.5 million	1,275	1,004	180				
Waste Treatment and Disposal	Solid Waste Combustors and Incinerators	562213	\$38.5 million	109	36	56				
Waste Treatment and Disposal	Remediation Services	562910	\$20.5 million	4,070	2,536	854				
Educational Services	Colleges, Universities, and Professional Schools	611310	\$27.5 million	4,329	1,745	1,011	799	356		
Commercial	Amusement and Theme Parks	713110	\$38.5 million	442	104	58				
Commercial	Linen and Uniform Supply	812330	NA							
Commercial	Industrial Launderers	812332	\$38.5 million	1,310	461	599				

Notes:

Blank cells represent unreported data in the category. N/A represent it is not a valid 2012 NAICS code thus SBA Size Standards is not available. When sub-categories are aggregated to the reported size categories, we treated unreported data as zero since no establishments were reported in the sub-category. When zero was explicitly reported for a size category, we report zero in the table.

^ These source categories have a 2007 NAICS description because they are not defined in the 2012 Census. The 2012 Census provides establishment and revenue data for these source categories on 2007 NAICS basis, as a total figure for all establishments and revenues. It does not provide a breakdown by employment size.

The following NAICS report aggregate data for other top employee size categories and thus are not reported in the table: 115114, 221111, 221112, 221117, 221118, 221122, 221210, 221310, 221320, 221330, 424510, 424710, 481111, 486110, 486210, 486910, 488210, 488320, 493110, 493190, 531120, 541380, 561990, 562211, 562212, 562213, 562910, 611310, 713110, and 812332.

For the following NAICS, total establishments include establishments which operated entire year and not operated entire year whereas the breakdown into categories is done for establishments operated entire year: 221111, 221112, 221117, 221118, 221122, 221210, 221310, 221320, 221330, 424510, 424710, 481111, 486110, 486210, 486910, 488210, 488320, 493110, 493190, 531120, 541380, 561990, 562211, 562212, 562213, 562910, 713110, and 812332.

For NAICS 115114, Post Harvest Crop Activities, the data is from County Business Patterns. Geography Area Series: County Business Patterns by Employment Size Class more information 2012 Business Patterns

332990 is not a valid 2012 NAICS code; therefore, no data are available in the 2012 Economic Census. Also, the size standards for this NAICS code are not available in the 2007, 2016, or 2017 SBA size standards. There is not even a description of this NAICS code in any of the SBA size standards. It could be a 2002 NAICS code. We found its description as a 2002 NAICS Code in the Survey of Current Business: Volume 88, Issues 1-6, January 1, 2008, U.S. Department of Commerce

482111 NAICS code (line-haul railroad) is excluded from the Economic Census; therefore, no data are available.

^^541715 is not a valid 2012 NAICS code; therefore, no data are available in the 2012 Economic Census. Four industries in the 2012 NAICS structure have been expanded for 2017. 541712 - Research and Development in the Physical, Engineering and Life Sciences (except Biotechnology) has been expanded to include 541713 - Research and Development in Nanotechnology 541715 - Research and Development in the Physical, Engineering and Life Sciences (except Nanotechnology)

For NAICS 611310, Colleges and Universities the data are from County Business Patterns. Geography Area Series: County Business Patterns by Employment Size Class more information 2012 Business Patterns

812330 is not a valid 2012 NAICS code; therefore, no data are available in the 2012 Economic Census. This code seems to be not a NAICS code but an IRS Statistics of Income (SOI) Program Industry Code for coding the industrial activities of corporations filing returns (https://www.irs.gov/irm/part1/irm_01-013-007). The SOI codes correspond to NAICS codes such as 812330 corresponds to 812332 Industrial Launderers and 812331 Linen Supply but is a different code.

NAICS 922140 (Correctional Institutions), NAICS 927110 (Space Research and Technology), NAICS 928110 (National Security) are government/public administration NAICS codes not covered by the Census.

NAICS 999999 is an unclassified code and therefore no data is available for it

Sources: 2012 Economic Census, 2012 County Business Patterns, 2017 SBA Size Standards, SBA February 2016 Size Standards, SBA 2007 Size Standards.

Table 6-2. Number of Employees by Industry and Enterprise Size: 2012

Sector	NAICS Descriptions	NAICS	SBA Size Standards (2017)	Total	Number of Employees by Employee Size Categories					
					≤19	20~99	100~499	500~999	1000~2499	≥2500
Agriculture	Postharvest Crop Activities (except Cotton Ginning)	115114	\$27.5 million	39,759	4,000	13,387	15,393	500-999		
Energy	Crude Petroleum and Natural Gas Extraction	211111	1250 (Feb 2016 Size Standards)	161,685	17,387	35,114	50,386	17,240	21,743	10,000-24,999
Energy	Natural Gas Liquid Extraction	211112	750 (Feb 2016 Size Standards)	14,537	1,094	4,989	5,001	3,241		
Industrial	Iron Ore Mining	212210	750	6,021	20-99	79	1,208	2,500-4,999		
Industrial	Lead Ore and Zinc Ore Mining	212231	750 (Feb 2016 Size Standards)	2,218	26		500-999			
Industrial	Copper Ore and Nickel Ore Mining	212234	1500 (Feb 2016 Size Standards)	12,555	40-198	100-249	3,127	4,806	2,500-4,999	
Industrial	All Other Metal Ore Mining	212299	750	3,824	90		1,902			
Industrial	Industrial Sand Mining	212322	500	4,168	492	2,871	736			
Industrial	Kaolin and Ball Clay Mining	212324	750	2,405	20-99	603	1,048			
Industrial	Potash, Soda, and Borate Mineral Mining	212391	750	5,109	36			3,739		
Industrial	All Other Nonmetallic Mineral Mining	212399	500	2,790	622	1,654				
Energy	Support Activities for Oil and Gas Operations	213112	\$38.5 million	323,523	29,106	96,295	114,543	32,014	22,687	10,000-24,999
Utilities	Hydroelectric Power Generation	221111	500	3,464	1,396	2,051	0			
Utilities	Fossil Fuel Electric Power Generation	221112	750	82,071	4,652	20,767	46,503			
Utilities	Biomass Electric Power Generation	221117	250	1,424	374	1,025	0			
Utilities	Other Electric Power Generation	221118	250	224	43-122	120-348	0			
Utilities	Other Electric Power Generation^	221119	4 million MWH (2007 Size Standards)	9,812						
Utilities	Electric Power Distribution	221122	1,000	362,844	26,966-29,465	109,403	123,223			
Utilities	Natural Gas Distribution	221210	1,000	83,937	9,854	25,647	36,677			
Utilities	Water Supply and Irrigation Systems	221310	\$27.5 million	36,352	15,641-18,140	11,268	6,789-9,288			
Utilities	Sewage Treatment Facilities	221320	\$20.5 million	6,849	3,228-3,477	2,835	500-999			
Utilities	Steam and Air-Conditioning Supply	221330	\$15 million	2,086	399-478	1,599	0			
Industrial	Other Animal Food Manufacturing	311119	500	27,958	6,669-7,168	16,363	3,730	500-999		
Industrial	Wet Corn Milling	311221	1,250	6,606	152-380	976	4,323	1,000-2,499		
Industrial	Soybean Processing^	311222	500 (2007 Size Standards)	6,504						
Industrial	Other Oilseed Processing^	311223	1000 (2007 Size Standards)	1,319						
Industrial	Soybean and Other Oilseed Processing	311224	1,000	7,823	333-482	3,864	3,320-3,819			
Industrial	Fats and Oils Refining and Blending	311225	1,000	9,006	246-404	1,899	6,764			
Industrial	Beet Sugar Manufacturing	311313	750	6,367	0-19	541-690	3,687	2,115		
Industrial	Cane Sugar Manufacturing	311314	1,000	6,683	50-208	719-798	4,622	1,000-2,499		

(continued)

Table 6-2. Number of Employees by Industry and Enterprise Size: 2012 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standards (2017)	Total	Number of Employees by Employee Size Categories					
					≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Frozen Fruit, Juice, and Vegetable Manufacturing	311411	1,000	33,766	335-414	3,269	19,480	9,491	1,000-2,499	
Industrial	Fruit and Vegetable Canning	311421	1,000	48,840	1,542-1,791	8,265	28,767	8,899	1,000-2,499	
Industrial	Specialty Canning	311422	1,250	11,850	139-237	819	4,567	4,915	1,000-2,499	
Industrial	Cheese Manufacturing	311513	1,250	44,374	1,387	8,219	25,325	6,279	3,165	
Industrial	Dry, Condensed, and Evaporated Dairy Product Manufacturing	311514	750	15,701	373-601	4,259	9,357	1,000-2,499	404	
Industrial	Rendering and Meat Byproduct Processing	311613	750	9,065	669	4,614	3,782			
Industrial	Commercial Bakeries	311812	1000	115,634	7,403-8,902	24,584	66,387	12,344		2,500-4,999
Industrial	Other Snack Food Manufacturing	311919	1250	27,297	911-1,160	4,514	16,961	3,855	1,000-2,499	
Industrial	Coffee and Tea Manufacturing	311920	750	15,340	1,180-1,329	3,096	7,292	1,000-2,499	1,000-2,499	
Industrial	Flavoring Syrup and Concentrate Manufacturing	311930	1000	7,043	418	1,918	4,707			
Industrial	Spice and Extract Manufacturing	311942	500	16,417	1,200	5,122	8,389	1,706		
Industrial	All Other Miscellaneous Food Manufacturing	311999	500	23,922	1,892-2,391	7,185	9,361	4,371	1,000-2,499	
Industrial	Breweries	312120	1250	26,336	2,033-2,781	5,583	5,805	11,471	1,000-2,499	
Industrial	Distilleries	312140	1000	6,989	725-874	962-1,211	5,056			
Industrial	Tobacco Manufacturing	312230	1500	14,127	60-297	1,416	3,756-5,255	2,164	5,000-9,999	
Industrial	Yarn Spinning Mills^	313111	500 (2007 Size Standards)							
Industrial	Thread Mills^	313113	500 (2007 Size Standards)							
Industrial	Broadwoven Fabric Mills	313210	1000	18,364	919-1,168	2,860	10,248	3,250	1,000-2,499	
Industrial	Narrow Fabric Mills^	313221	500 (2007 Size Standards)	148						
Industrial	Textile and Fabric Finishing Mills	313310	1000	22,970	2,931-3,430	7,518	10,959	1,000-2,499		
Industrial	Broadwoven Fabric Finishing Mills^	313311	1000 (2007 Size Standards)	13,442						
Industrial	Fabric Coating Mills	313320	1000	6,675	577-726	3,393	2,637-2,886			
Industrial	Tire Cord and Tire Fabric Mills^	314992	1000 (2007 Size Standards)	1,915						
Industrial	Leather and Hide Tanning and Finishing	316110	500	3,510	634-1,032	1,017-1,516	1,565			
Industrial	Sawmills	321113	500	64,743	11,078	27,188	26,478			
Industrial	Wood Preservation	321114	500	8,061	1,544-1,793	4,957	1,409-1,908			
Industrial	Hardwood Veneer and Plywood Manufacturing	321211	500	11,734	829	3,454	7,453			

(continued)

Table 6-2. Number of Employees by Industry and Enterprise Size: 2012 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standards (2017)	Number of Employees by Employee Size Categories						
				Total	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Softwood Veneer and Plywood Manufacturing	321212	1250	13,739	102-260	1,452	9,167	2,500-4,999		
Industrial	Engineered Wood Member (except Truss) Manufacturing	321213	750	2,854	481-709	1,452	869			
Industrial	Reconstituted Wood Product Manufacturing	321219	750	13,531	455	4,060	9,017			
Industrial	Wood Window and Door Manufacturing	321911	1000	46,713	4,492	11,233	20,163	2,358	8,468	
Industrial	Cut Stock, Resawing Lumber, and Planing	321912	500	24,358	4,183	13,175	6,442-6,941	500-999		
Industrial	All Other Miscellaneous Wood Product Manufacturing	321999	500	25,547	7,374	13,143	5,031			
Industrial	Pulp Mills	322110	750	7,728	0-57	200-498	4,673	2,773		
Industrial	Paper (except Newsprint) Mills	322121	1250	60,217	40-217	2,057	19,290	24,560	14,180	
Industrial	Newsprint Mills	322122	750	3,573	0-19	40-198	2,746	500-999		
Industrial	Paperboard Mills	322130	1250	34,910	20-137	3,444	18,989	11,236	1,000-2,499	
Industrial	Corrugated and Solid Fiber Box Manufacturing	322211	1250	76,372	3,266	28,392	44,714			
Industrial	Paper Bag and Coated and Treated Paper Manufacturing	322220	750	50,481	2,256-2,754	14,037	29,303	3,094	1,000-2,499	
Industrial	Coated and Laminated Paper Manufacturing^	322222	500 (2007 Size Standards)	25,182						
Industrial	Sanitary Paper Product Manufacturing	322291	1500	18,071	268-426	2,265	8,749	5,679	1,000-2,499	
Industrial	All Other Converted Paper Product Manufacturing	322299	500	16,455	1,486-1,735	7,634	6,614	500-999		
Industrial	Commercial Lithographic Printing^	323110	500 (2007 Size Standards)	215,340						
Industrial	Commercial Printing (except Screen and Books)	323111	500	352,659	77,438	124,583	121,445	10,000-24,999	2,500-4,999	
Industrial	Books Printing	323117	1250	24,104	1,365-1,614	3,708	12,875	3,810	1,000-2,499	
Industrial	Petroleum Refineries	324110	1500	62,542	199-278	969	18,775	25,000-49,999	16,392	
Industrial	Asphalt Shingle and Coating Materials Manufacturing	324122	750	9,094	786-935	4,404	3,816-4,062			
Industrial	All Other Petroleum and Coal Products Manufacturing	324199	500	3,337	174-402	1,372	1,603-1,852			
Industrial	Petrochemical Manufacturing	325110	1000	8,582	40-217	703	4,894	2,911		
Industrial	Industrial Gas Manufacturing	325120	1000	9,723	2,169	5,072	1,668-2,167	500-999		
Industrial	Synthetic Dye and Pigment Manufacturing	325130	1000	9,064	451-679	2,209	5,227	1,000-2,499		
Industrial	Inorganic Dye and Pigment Manufacturing^	325131	1000 (2007 Size Standards)	5,455						

(continued)

Table 6-2. Number of Employees by Industry and Enterprise Size: 2012 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standards (2017)	Number of Employees by Employee Size Categories						
				Total	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Synthetic Organic Dye and Pigment Manufacturing [^]	325132	750 (2007 Size Standards)	3,608						
Industrial	Other Basic Inorganic Chemical Manufacturing	325180	1000	37,114	2,339	10,514	14,238	5,133	4,893	
Industrial	Alkalies and Chlorine Manufacturing [^]	325181	1000 (2007 Size Standards)	6,879						
Industrial	Carbon Black Manufacturing [^]	325182	500 (2007 Size Standards)	1,714						
Industrial	All Other Basic Inorganic Chemical Manufacturing [^]	325188	1000 (2007 Size Standards)	28,521						
Industrial	Cyclic Crude and Intermediate Manufacturing [^]	325192	750 (2007 Size Standards)	3,052						
Industrial	Ethyl Alcohol Manufacturing	325193	1000	10,391	186-414	7,790	2,367			
Industrial	Cyclic Crude, Intermediate, and Gum and Wood Chemical Manufacturing	325194	1250	5,646	196-354	1,265	3,084-3,333	500-999		
Industrial	All Other Basic Organic Chemical Manufacturing	325199	1250	67,751	2,796-3,794	13,802	23,491	12,301	5,526	5,000-9,999
Industrial	Plastics Material and Resin Manufacturing	325211	1250	66,325	3,847-4,096	24,667	23,319	3,477	7,091	2,500-4,999
Industrial	Synthetic Rubber Manufacturing	325212	1000	7,115	424	2,506	4,185			
Industrial	Artificial and Synthetic Fibers and Filaments Manufacturing	325220	1000	13,664	346-504	1,683	7,779	2,527	1,000-2,499	
Industrial	Cellulosic Organic Fiber Manufacturing [^]	325221	1000 (2007 Size Standards)	1,455						
Industrial	Noncellulosic Organic Fiber Manufacturing [^]	325222	1000 (2007 Size Standards)	12,209						
Industrial	Nitrogenous Fertilizer Manufacturing	325311	1000	5,255	644-793	2,144	2,346-2,595			
Industrial	Phosphatic Fertilizer Manufacturing	325312	750	6,582	248-406	605	3,234	1,000-2,499	1,000-2,499	
Industrial	Pesticide and Other Agricultural Chemical Manufacturing	325320	1000	11,397	722	2,311	6,011	1,000-2,499	1,000-2,499	
Industrial	Medicinal and Botanical Manufacturing	325411	1000	27,879	1,238	5,507	10,898	5,116	5,122	
Industrial	Pharmaceutical Preparation Manufacturing	325412	1250	147,595	3,648	13,401	49,539	23,501	18,103	39,404
Industrial	Biological Product (except Diagnostic) Manufacturing	325414	1250	40,485	988-1,286	3,915	12,326	10,490	9,201	2,500-4,999
Industrial	Paint and Coating Manufacturing	325510	1000	34,148	4,063-4,562	13,530	13,558	2,500-4,999		
Industrial	Adhesive Manufacturing	325520	500	19,503	1,934	9,454	8,116			
Industrial	Surface Active Agent Manufacturing	325613	750	5,490	343-571	2,295	2,156-2,405	500-999		
Industrial	Toilet Preparation Manufacturing	325620	1250	48,520	2,876	9,175	21,673	10,222	4,575	
Industrial	Explosives Manufacturing	325920	750	6,180	265-423	996	4,028	500-999		

(continued)

Table 6-2. Number of Employees by Industry and Enterprise Size: 2012 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standards (2017)	Number of Employees by Employee Size Categories						
				Total	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Custom Compounding of Purchased Resins	325991	500	16,938	1,294-1,543	8,047	7,025	500-999		
Industrial	Photographic Film, Paper, Plate, and Chemical Manufacturing	325992	1500	13,927	992	2,217	4,524	500-999	1,000-2,499	2,500-4,999
Industrial	All Other Miscellaneous Chemical Product and Preparation Manufacturing	325998	500	33,681	4,380	12,039	13,821	3,441		
Industrial	Plastics Packaging Film and Sheet (including Laminated) Manufacturing	326112	1000	30,792	970-1,119	9,272	16,430	2,500-4,999	1,000-2,499	
Industrial	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing	326113	750	36,664	1,471-1,720	9,927	21,234	2,714	1,000-2,499	
Industrial	Unlaminated Plastics Profile Shape Manufacturing	326121	500	19,002	1,191-1,440	6,485	10,691	500-999		
Industrial	Plastics Pipe and Pipe Fitting Manufacturing	326122	750	20,947	1,459	11,652	7,837			
Industrial	Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing	326130	500	10,787	755	3,064	4,443	2,526		
Industrial	Polystyrene Foam Product Manufacturing	326140	1000	24,088	1,246-1,395	7,922	10,445	2,922	1,000-2,499	
Industrial	Urethane and Other Foam Product (except Polystyrene) Manufacturing	326150	750	28,498	1,910-2,159	13,735	12,220	500-999		
Industrial	Plastics Plumbing Fixture Manufacturing	326191	750	14,512	1,636	5,416	7,460			
Industrial	All Other Plastics Product Manufacturing	326199	750	328,389	21,785	95,108	173,474	26,783	11,241	
Industrial	Tire Manufacturing (except Retreading)	326211	1500	43,197	152-380	824-1,073	3,722-5,221	7,608	27,203	2,500-4,999
Industrial	Rubber and Plastics Hoses and Belting Manufacturing	326220	750	18,748	644-1,042	3,863-5,362	11,312	2,626		
Industrial	Rubber Product Manufacturing for Mechanical Use	326291	750	28,414	1,499	7,251	16,746	2,919		
Industrial	All Other Rubber Product Manufacturing	326299	500	30,971	2,443	11,264	14,638	1,000-2,499	1,000-2,499	
Industrial	Pottery, Ceramics, and Plumbing Fixture Manufacturing	327110	1000	13,097	2,156	3,670	4,860	1,000-2,499	1,000-2,499	
Industrial	Clay Building Material and Refractories Manufacturing	327120	750	21,273	1,917	11,486	7,870			
Industrial	Clay Refractory Manufacturing^	327124	500 (2007 Size Standards)	4,389						
Industrial	Flat Glass Manufacturing	327211	1000	9,022	53-151	500-998	7,650	500-999		
Industrial	Other Pressed and Blown Glass and Glassware Manufacturing	327212	1250	14,856	1,365-1,614	2,691	6,018	2,420	1,000-2,499	
Industrial	Cement Manufacturing	327310	1000	11,957	671-820	3,230	7,901-8,150			

(continued)

Table 6-2. Number of Employees by Industry and Enterprise Size: 2012 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standards (2017)	Number of Employees by Employee Size Categories						
				Total	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Lime Manufacturing	327410	750	4,363	157-315	1,658	1,899	500-999		
Industrial	Gypsum Product Manufacturing	327420	1500	7,761	558-707	3,964	3,180-3,429			
Industrial	Abrasive Product Manufacturing	327910	750	12,701	1,216	4,668	4,796	2,022		
Industrial	Mineral Wool Manufacturing	327993	1500	13,950	1,016-1,265	2,965	8,538			
Industrial	All Other Miscellaneous Nonmetallic Mineral Product Manufacturing	327999	500	10,728	1,922	5,563	3,245			
Industrial	Iron and Steel Mills and Ferroalloy Manufacturing	331110	1500	102,974	620-1,347	7,432-9,931	31,169	18,318	28,579	10,000-24,999
Industrial	Iron and Steel Mills^	331111	1000 (2007 Size Standards)	99,246						
Industrial	Electrometallurgical Ferroalloy Product Manufacturing^	331112	750 (2007 Size Standards)	3,728						
Industrial	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel	331210	1000	26,400	290-697	4,731	13,514	3,892	3,909	
Industrial	Rolled Steel Shape Manufacturing	331221	1000	6,780	531-780	2,978	2,516-2,765	500-999		
Industrial	Primary Aluminum Production^	331312	1000 (2007 Size Standards)	6,874						
Industrial	Alumina Refining and Primary Aluminum Production	331313	1000	8,818	72-91	792-1,041	2,774	5,103		
Industrial	Secondary Smelting and Alloying of Aluminum	331314	750	5,592	214-293	3,162	2,024-2,273			
Industrial	Aluminum Sheet, Plate, and Foil Manufacturing	331315	1250	17,108	137-295	1,132-1,281	4,750	7,788	2,500-4,999	
Industrial	Aluminum Extruded Product Manufacturing^	331316	750 (2007 Size Standards)							
Industrial	Other Aluminum Rolling, Drawing, and Extruding	331318	750	24,480	545	4,695	16,739	2,501		
Industrial	Nonferrous Metal (except Aluminum) Smelting and Refining	331410	1000	10,969	668	2,094	4,994	3,215		
Industrial	Primary Smelting and Refining of Copper^	331411	1000 (2007 Size Standards)	2,143						
Industrial	Primary Smelting and Refining of Nonferrous Metal (except Copper and Aluminum)^	331419	750 (2007 Size Standards)	8,826						
Industrial	Copper Rolling, Drawing, Extruding, and Alloying	331420	1000	21,378	457-685	5,465	12,010	2,237	1,000-2,499	
Industrial	Copper Wire (except Mechanical) Drawing^	331422	1000 (2007 Size Standards)	10,719						
Industrial	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, and Extruding	331491	750	17,428	854-1,003	4,121	6,853	4,163	1,000-2,499	

(continued)

Table 6-2. Number of Employees by Industry and Enterprise Size: 2012 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standards (2017)	Number of Employees by Employee Size Categories						
				Total	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	331492	750	10,958	871-1,020	3,974	5,242	500-999		
Industrial	Iron Foundries	331511	1000	38,637	921-1,070	7,305	21,878	7,357	1,000-2,499	
Industrial	Steel Foundries (except Investment)	331513	500	17,568	476-774	3,434	9,738	2,675	1,000-2,499	
Industrial	Aluminum Die-Casting Foundries^	331521	500 (2007 Size Standards)	23,319						
Industrial	Aluminum Foundries (except Die-Casting)	331524	500	15,416	1,457	5,616	8,344			
Industrial	Nonferrous Forging	332112	750	6,964	155-313	906	3,014	2,857		
Industrial	Metal Crown, Closure, and Other Metal Stamping (except Automotive)	332119	500	53,219	5,556	25,435	19,580	2,650		
Industrial	Hand and Edge Tool Manufacturing^	332212	500 (2007 Size Standards)	23,342						
Industrial	Prefabricated Metal Building and Component Manufacturing	332311	750	21,712	1,969-2,218	7,496	11,412	500-999		
Industrial	Fabricated Structural Metal Manufacturing	332312	500	87,923	12,523	38,851	30,902	1,000-2,499	2,500-4,999	
Industrial	Metal Window and Door Manufacturing	332321	750	45,665	3,504-4,003	13,957	19,812	5,734	1,000-2,499	
Industrial	Sheet Metal Work Manufacturing	332322	500	99,904	19,211	48,064	29,443	1,000-2,499	1,000-2,499	
Industrial	Metal Can Manufacturing	332431	1500	17,296	170-328	3,078	13,977			
Industrial	Other Metal Container Manufacturing	332439	500	11,789	1,174	5,139	3,790	1,688		
Industrial	Bolt, Nut, Screw, Rivet, and Washer Manufacturing	332722	500	36,321	3,108	11,929	18,233	3,052		
Industrial	Metal Heat Treating	332811	750	22,199	4,193-4,442	12,182	5,096	500-999		
Industrial	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers	332812	500	49,633	10,485	27,762	11,386			
Industrial	Electroplating, Plating, Polishing, Anodizing, and Coloring	332813	500	52,698	10,394-11,893	27,607	12,700	1,000-2,499		
Industrial	Other Fabricated Metal Manufacturing	332990	NA							
Industrial	Small Arms Ammunition Manufacturing	332992	1250	10,413	260-339	350-748	1,379-2,878	1,000-2,499	2,500-4,999	2,500-4,999
Industrial	Ammunition (except Small Arms) Manufacturing	332993	1500	11,003	60-297	120-348	3,469	2,777		2,500-4,999
Industrial	All Other Miscellaneous Fabricated Metal Product Manufacturing	332999	750	70,421	15,423	29,755	22,290	2,954		
Industrial	Farm Machinery and Equipment Manufacturing	333111	1250	63,643	3,368-5,366	12,232	21,317	9,796	9,256	5,000-9,999
Industrial	Lawn and Garden Tractor and Home Lawn and Garden Equipment Manufacturing	333112	1500	15,345	300-747	1,408	3,087	5,355	5,000-9,999	

(continued)

Table 6-2. Number of Employees by Industry and Enterprise Size: 2012 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standards (2017)	Number of Employees by Employee Size Categories						
				Total	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Construction Machinery Manufacturing	333120	1250	62,302	2,342-2,591	12,265	18,149	9,666	16,753	2,500-4,999
Industrial	Mining Machinery and Equipment Manufacturing	333131	500	17,280	1,044-1,193	4,806	8,011	500-999	2,500-4,999	
Industrial	Printing Machinery and Equipment Manufacturing^	333293	500 (2007 Size Standards)	7,866						
Industrial	Photographic and Photocopying Equipment Manufacturing	333316	1000	5,376	704	2,170	2,503			
Industrial	Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing	333415	1250	86,110	2,712	11,341	40,169	15,862	16,029	
Industrial	Machine Tool (Metal Cutting Types) Manufacturing^	333512	500 (2007 Size Standards)	16,078						
Industrial	Machine Tool (Metal Forming Types) Manufacturing^	333513	500 (2007 Size Standards)	8,607						
Industrial	Turbine and Turbine Generator Set Units Manufacturing	333611	1500	36,955	140-447	4,163	11,246	7,822	7,825	5,000-9,999
Industrial	Other Engine Equipment Manufacturing	333618	1500	38,195	1,051	3,513	14,321	10,194	9,117	
Industrial	Overhead Traveling Crane, Hoist, and Monorail System Manufacturing	333923	1250	17,862	1,089	4,121	7,224	1,000-2,499	2,500-4,999	
Industrial	Welding and Soldering Equipment Manufacturing	333992	1250	14,874	1,189	3,516	3,952		6,218	
Industrial	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	334220	1250	73,195	2,852	9,519	17,278	5,760	11,163	26,623
Industrial	Electron Tube Manufacturing^	334411	750 (2007 Size Standards)	5,222						
Industrial	Bare Printed Circuit Board Manufacturing	334412	750	24,165	1,829	8,601	11,053	2,683		
Industrial	Semiconductor and Related Device Manufacturing	334413	1250	102,570	3,174	7,495	22,441	19,559	19,875	30,027
Industrial	Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use	334512	500	11,199	970-1,219	3,017	3,410	2,055	1,000-2,499	
Industrial	Blank Magnetic and Optical Recording Media Manufacturing	334613	1000	1,207	153-381	404-553				
Industrial	Electric Lamp Bulb and Part Manufacturing	335110	1250	6,494	140-447	948	4,134	1,000-2,499		
Industrial	Household Laundry Equipment Manufacturing	335224	1250	5,000-9,999		20-99		500-999	1,000-2,499	2,500-4,999
Industrial	Other Major Household Appliance Manufacturing	335228	1000	8,772	20-118	243-392	100-249	5,351	2,500-4,999	

(continued)

Table 6-2. Number of Employees by Industry and Enterprise Size: 2012 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standards (2017)	Number of Employees by Employee Size Categories						
				Total	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Power, Distribution, and Specialty Transformer Manufacturing	335311	750	19,333	522-820	3,696	10,044	2,427	1,000-2,499	
Industrial	Motor and Generator Manufacturing	335312	1250	31,600	1,499-1,748	6,006	16,514	4,554	2,500-4,999	
Industrial	Storage Battery Manufacturing	335911	1250	20,383	140-447	1,308	11,011	1,805		5,000-9,999
Industrial	Current-Carrying Wiring Device Manufacturing	335931	500	25,909	1,244-1,393	6,924	12,856	3,305	1,000-2,499	
Industrial	Noncurrent-Carrying Wiring Device Manufacturing	335932	1000	14,237	453	2,488	8,275	500-999	1,000-2,499	
Industrial	Carbon and Graphite Product Manufacturing	335991	750	8,992	429-508	2,201	5,694	500-999		
Industrial	Automobile Manufacturing	336111	1500	69,285	521	937	1,061-3,060	1,000-2,499	19,113	46,033
Industrial	Light Truck and Utility Vehicle Manufacturing	336112	1500	58,658	125-283	472	328	1,000-2,499	14,317	41,216
Industrial	Heavy Duty Truck Manufacturing	336120	1500	29,275	120-367	350-748	3,531	4,406	15,708	2,500-4,999
Industrial	Motor Vehicle Body Manufacturing	336211	1000	41,176	2,611-3,110	11,016	18,841	7,406	1,000-2,499	
Industrial	Truck Trailer Manufacturing	336212	1000	27,670	1,338-1,587	6,166	11,603	5,511	2,500-4,999	
Industrial	Motor Vehicle Gasoline Engine and Engine Parts Manufacturing	336310	1000	48,566	2,530	4,977	20,618	17,236	3,207	
Industrial	Carburetor, Piston, Piston Ring, and Valve Manufacturing^	336311	500 (2007 Size Standards)							
Industrial	Gasoline Engine and Engine Parts Manufacturing^	336312	750 (2007 Size Standards)							
Industrial	Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing	336330	1000	29,282	752	2,154	13,432	6,893	1,000-2,499	2,500-4,999
Industrial	Motor Vehicle Brake System Manufacturing	336340	1250	23,130	401-550	2,165	13,657	4,048	2,500-4,999	
Industrial	Motor Vehicle Transmission and Power Train Parts Manufacturing	336350	1500	59,908	1,197-1,446	5,330	24,750	9,868	16,054	2,500-4,999
Industrial	Motor Vehicle Seating and Interior Trim Manufacturing	336360	1500	50,452	922-1,071	4,809	27,116	14,670	2,500-4,999	
Industrial	Motor Vehicle Metal Stamping	336370	1000	83,680	1,970	15,545	39,713	15,601	10,851	
Industrial	Other Motor Vehicle Parts Manufacturing	336390	1000	120,977	4,873	16,215	60,297	29,019	10,575	
Industrial	All Other Motor Vehicle Parts Manufacturing^	336399	750 (2007 Size Standards)							

(continued)

Table 6-2. Number of Employees by Industry and Enterprise Size: 2012 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standards (2017)	Number of Employees by Employee Size Categories						
				Total	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Aircraft Manufacturing	336411	1500	171,749	910	2,099	10,481	6,565	13,127	138,569
Industrial	Aircraft Engine and Engine Parts Manufacturing	336412	1500	79,125	1,204	5,377	26,809	8,537	8,624	28,575
Industrial	Other Aircraft Parts and Auxiliary Equipment Manufacturing	336413	1250	106,935	3,024	10,114	32,132	16,828	12,271	32,567
Industrial	Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing	336415	1250	12,530	5-24	120-348	1,798-2,297	2,165	8,035	
Industrial	Railroad Rolling Stock Manufacturing	336510	1500	28,372	733	3,624	9,204	6,638	2,500-4,999	2,500-4,999
Industrial	Ship Building and Repairing	336611	1250	105,192	2,370	8,026	18,580	10,784	7,483	57,949
Industrial	Boat Building	336612	1000	28,081	2,873-3,372	6,480	15,021	2,365	1,000-2,499	
Industrial	Military Armored Vehicle, Tank, and Tank Component Manufacturing	336992	1500	9,956	20-137	612-861	2,817	3,830	2,500-4,999	
Industrial	Wood Kitchen Cabinet and Countertop Manufacturing	337110	750	77,649	24,676-29,675	20,020	20,707	7,864	2,500-4,999	
Industrial	Upholstered Household Furniture Manufacturing	337121	1000	55,557	4,476-5,975	9,189	17,217	13,803	7,180	2,500-4,999
Industrial	Nonupholstered Wood Household Furniture Manufacturing	337122	750	31,423	8,834	7,605	9,791	1,000-2,499	2,500-4,999	
Industrial	Institutional Furniture Manufacturing	337127	500	26,119	2,549-2,798	9,874	12,619	500-999		
Industrial	Wood Office Furniture Manufacturing	337211	1000	13,774	1,358-1,607	3,225	6,913	1,000-2,499		
Industrial	Office Furniture (except Wood) Manufacturing	337214	1000	22,528	513-811	2,611	9,414	3,122	2,500-4,999	2,500-4,999
Industrial	Showcase, Partition, Shelving, and Locker Manufacturing	337215	500	33,357	4,006	12,039	14,824	2,490		
Industrial	Blind and Shade Manufacturing	337920	1000	11,569	1,359	2,526	5,711	1,974		
Industrial	Surgical and Medical Instrument Manufacturing	339112	1000	105,419	4,053-7,051	14,278	46,482	18,851	18,966	2,500-4,999
Industrial	Surgical Appliance and Supplies Manufacturing	339113	750	99,091	7,089-8,588	18,583	36,930	7,680	17,484	10,000-24,999
Industrial	Jewelry and Silverware Manufacturing	339910	500	26,026	6,835	8,379	6,720	1,000-2,499	2,500-4,999	
Industrial	Sporting and Athletic Goods Manufacturing	339920	750	36,968	5,960	11,001	12,751	2,674	4,582	
Industrial	Office Supplies (except Paper) Manufacturing	339940	750	10,517	1,739-1,988	3,700	4,143	500-999		
Industrial	Gasket, Packing, and Sealing Device Manufacturing	339991	500	29,140	2,253-2,502	8,355	14,382	2,904	1,000-2,499	

(continued)

Table 6-2. Number of Employees by Industry and Enterprise Size: 2012 (continued)

				Number of Employees by Employee Size Categories						
Sector	NAICS Descriptions	NAICS	SBA Size Standards (2017)	Total	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Burial Casket Manufacturing	339995	1000	3,751	467-616	945	1,157-1,656	500-999		
Industrial	All Other Miscellaneous Manufacturing	339999	500	53,872	23,152	15,197	9,848	1,000-2,499	2,500-4,999	
Commercial	Grain and Field Bean Merchant Wholesalers	424510	200	49,603	25,751	18,933				
Commercial	Petroleum Bulk Stations and Terminals	424710	200	73,309	22,824	31,690				
Commercial	Scheduled Passenger Air Transportation	481111	1500	398,335	7,029-7,528	28,440				
Commercial	Line-Haul Railroads	482111	1500							
Energy	Pipeline Transportation of Crude Oil	486110	1500	11,299	3,107	5,050				
Energy	Pipeline Transportation of Natural Gas	486210	\$27.5 million	29,597	10,539	8,368				
Energy	Pipeline Transportation of Refined Petroleum Products	486910	1500	6,233	2,442-3,589	1,500-3,498				
Commercial	Support Activities for Rail Transportation	488210	\$15 million	32,100	5,751	12,738				
Commercial	Marine Cargo Handling	488320	\$38.5 million	53,313	1,414	5,845				
Commercial	General Warehousing and Storage	493110	\$27.5 million	599,384	39,356	117,612				
Commercial	Other Warehousing and Storage	493190	\$27.5 million	66,767	10,255-14,253	15,087-20,086				
Commercial	Lessors of Nonresidential Buildings (except Miniwarehouses)	531120	\$27.5 million	170,381	92,430	40,932				
Commercial	Testing Laboratories	541380	\$15 million	115,018	28,410	50,663				
Commercial	Research and Development in the Physical, Engineering and Life Sciences (except Nanotechnology and Biotechnology)^^^	541715	1000							
Commercial	All Other Support Services	561990	\$11 million	148,019	45,598	53,251				
Waste Treatment	Hazardous Waste Treatment and Disposal	562211	\$38.5 million	27,782	3,566	8,810				
Waste Treatment	Solid Waste Landfill	562212	\$38.5 million	16,209	6,678	6,332				
Waste Treatment	Solid Waste Combustors and Incinerators	562213	\$38.5 million	4,784	243-322	2,816				
Waste Treatment	Remediation Services	562910	\$20.5 million	78,027	17,113	34,649				
Educational Services	Colleges, Universities, and Professional Schools	611310	\$27.5 million	1,805,199	10,711	49,461	194,356	256,266		
Commercial	Amusement and Theme Parks	713110	\$38.5 million	116,148	619	2,777				
Commercial	Linen and Uniform Supply	812330	NA							
Commercial	Industrial Launderers	812332	\$38.5 million	60,452	3,886	28,406				

Notes:

Blank cells represent unreported data in the category. NA means it is not a valid 2012 NAICS code thus an SBA Size Standard is not available. When sub-categories are aggregated to the reported size categories, we treated unreported data as zero since no employment was reported in the sub-category. When zero was explicitly reported for a size category, we report zero in the table.

^ These source categories have a 2007 NAICS description because they are not defined in the 2012 Census. The 2012 Census provides establishment and revenue data for these source categories on 2007 NAICS basis, as a total figure for all establishments and revenues. It does not provide a breakdown by employment size.

The following NAICS report aggregate data for other top employee size categories and thus are not reported in the table: 221111, 221112, 221117, 221118, 221122, 221210, 221310, 221320, 221330, 424510, 424710, 481111, 486110, 486210, 486910, 488210, 488320, 493110, 493190, 531120, 541380, 561990, 562211, 562212, 562213, 562910, 713110, and 812332.

For the following NAICS, total receipts include establishments that operated the entire year and not operated the entire year, whereas the breakdown into categories is done for establishments operated the entire year: 221111, 221112, 221117, 221118, 221122, 221210, 221310, 221320, 221330, 424510, 424710, 481111, 486110, 486210, 486910, 488210, 488320, 493110, 493190, 531120, 541380, 561990, 562211, 562212, 562213, 562910, 713110, and 812332.

For NAICS 115114, Post harvest Crop Activities, the data are from County Business Patterns, but there are no revenue data. Geography Area Series: County Business Patterns by Employment Size Class more information 2012 Business Patterns.

332990 is not a valid 2012 NAICS code; therefore, no data are available in the 2012 Economic Census. Also, the size standards for this NAICS code are not available in the 2007, 2016, or 2017 SBA Size Standards. There is not even a description of this NAICS code in any of the SBA Size Standards. It could be a 2002 NAICS code. We found its description as a 2002 NAICS Code in the Survey of Current Business: Volume 88, Issues 1-6, January 1, 2008, U.S. Department of Commerce.

482111 NAICS code (line-haul railroad) is excluded from the Economic Census; therefore, no data are available.

541715 is not a valid 2012 NAICS code; therefore, no data are available in the 2012 Economic Census. Four industries in the 2012 NAICS structure have been expanded for 2017. 541712—Research and Development in the Physical, Engineering and Life Sciences (except Biotechnology) has been expanded to include 541713 - Research and Development in Nanotechnology 541715—Research and Development in the Physical, Engineering and Life Sciences (except Nanotechnology).

812330 is not a valid 2012 NAICS code; therefore, no data are available in the 2012 Economic Census. This code seems to be not a NAICS code but an IRS SOI Program Industry Code for coding the industrial activities of corporations filing returns (https://www.irs.gov/irm/part1/irm_01-013-007). The SOI codes correspond to NAICS codes such as 812330 corresponds to 812332 Industrial Launderers and 812331 Linen Supply but is a different code.

For NAICS 611310, Colleges and Universities establishment and employment data are from County Business Patterns but there are no revenue data. Geography Area Series: County Business Patterns by Employment Size Class more information 2012 Business Patterns.

NAICS 922140 (Correctional Institutions), NAICS 927110 (Space Research and Technology), NAICS 928110 (National Security) are government/public administration NAICS codes not covered by the Census.

NAICS 999999 is an unclassified code and therefore no data are available for it.

Sources: 2012 Economic Census, 2017 SBA Size Standards, SBA February 2016 Size Standards, SBA 2007 Size Standards, Federal Reserve Bank of St. Louis Economic Research.

Table 6-3. Receipts by Industry and Enterprise Size: 2012 (in millions of 2017\$)

Sector	NAICS Descriptions	NAICS	SBA Size Standards (2017)	Receipts by Employee Size Categories (in millions of 2017\$)						
				Total	≤19	20~99	100~499	500~999	1000~2499	≥2500
Agriculture	Postharvest Crop Activities (except Cotton Ginning)	115114	\$27.5 million							
Energy	Crude Petroleum and Natural Gas Extraction	211111	1250 (Feb 2016 Size Standards)	292,272	D	72,875	81,714	58,538	37,553	D
Energy	Natural Gas Liquid Extraction	211112	750 (Feb 2016 Size Standards)	42,913	6,602	17,760	11,674	6,004		
Industrial	Iron Ore Mining	212210	750	5,141	D	45	1,082	D		
Industrial	Lead Ore and Zinc Ore Mining	212231	750 (Feb 2016 Size Standards)	1,812	D					
Industrial	Copper Ore and Nickel Ore Mining	212234	1500 (Feb 2016 Size Standards)	11,581	D	D	D	3,732	D	
Industrial	All Other Metal Ore Mining	212299	750	1,648	D		758			
Industrial	Industrial Sand Mining	212322	500	1,868	191	1,239	410			
Industrial	Kaolin and Ball Clay Mining	212324	750	919	D	197	490			
Industrial	Potash, Soda, and Borate Mineral Mining	212391	750	3,129	D			2,163		
Industrial	All Other Nonmetallic Mineral Mining	212399	500	759	D	374				
Energy	Support Activities for Oil and Gas Operations	213112	\$38.5 million	91,396	6,440	21,676	28,626	11,158	12,782	D
Utilities	Hydroelectric Power Generation	221111	500	2,643	Q	Q	Q			
Utilities	Fossil Fuel Electric Power Generation	221112	750	87,821	Q	Q	Q			
Utilities	Biomass Electric Power Generation	221117	250	778	Q	Q	Q			
Utilities	Other Electric Power Generation	221118	250	47	Q	Q	Q			
Utilities	Other Electric Power Generation^	221119	4 million MWH (2007 Size Standards)	7,795						
Utilities	Electric Power Distribution	221122	1,000	323,472	Q	Q	Q			
Utilities	Natural Gas Distribution	221210	1,000	96,546	Q	Q	Q			
Utilities	Water Supply and Irrigation Systems	221310	\$27.5 million	10,173	Q	Q	Q			
Utilities	Sewage Treatment Facilities	221320	\$20.5 million	1,484	Q	Q	Q			
Utilities	Steam and Air-Conditioning Supply	221330	\$15 million	1,540	Q	Q	Q			
Industrial	Other Animal Food Manufacturing	311119	500	39,196	D	22,711	D	D		
Industrial	Wet Corn Milling	311221	1,250	13,996	D	1,529	9,918	D		
Industrial	Soybean Processing^	311222	500 (2007 Size Standards)	40,769						
Industrial	Other Oilseed Processing^	311223	1000 (2007 Size Standards)	2,880						
Industrial	Soybean and Other Oilseed Processing	311224	1,000	43,649	D	25,313	D			
Industrial	Fats and Oils Refining and Blending	311225	1,000	18,069	D	5,258	D			
Industrial	Beet Sugar Manufacturing	311313	750	5,018	D	D	D	1,489		
Industrial	Cane Sugar Manufacturing	311314	1,000	6,358	D	D	4,396	D		
Industrial	Frozen Fruit, Juice, and Vegetable Manufacturing	311411	1,000	13,130	D	D	7,245	D	D	
Industrial	Fruit and Vegetable Canning	311421	1,000	25,361	D	3,850	15,598	D	D	
Industrial	Specialty Canning	311422	1,250	10,240	D	D	D	4,108	D	
Industrial	Cheese Manufacturing	311513	1,250	44,453	1,162	7,384	27,805	4,691	3,411	
Industrial	Dry, Condensed, and Evaporated Dairy Product Manufacturing	311514	750	21,054	D	4,664	12,803	D		

(continued)

Table 6-3. Receipts by Industry and Enterprise Size: 2012 (in millions of 2017\$) (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standards (2017)	Receipts by Employee Size Categories (in millions of 2017\$)						
				Total	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Rendering and Meat Byproduct Processing	311613	750	5,699	D	2,771	2,334			
Industrial	Commercial Bakeries	311812	1000	30,302	D	4,994	19,787	3,000		D
Industrial	Other Snack Food Manufacturing	311919	1250	22,227	D	1,545	18,227	D	D	
Industrial	Coffee and Tea Manufacturing	311920	750	14,220	D	1,818	10,851	D	D	
Industrial	Flavoring Syrup and Concentrate Manufacturing	311930	1000	9,433	D	D	8,062			
Industrial	Spice and Extract Manufacturing	311942	500	9,870	D	2,716	4,456	D		
Industrial	All Other Miscellaneous Food Manufacturing	311999	500	12,383	D	4,099	4,855	2,149	D	
Industrial	Breweries	312120	1250	30,610	D	1,895	D	D	D	
Industrial	Distilleries	312140	1000	10,367	D	D	D			
Industrial	Tobacco Manufacturing	312230	1500	43,314	D	D	9,129	1,513	D	
Industrial	Yarn Spinning Mills^	313111	500 (2007 Size Standards)	4,616						
Industrial	Thread Mills^	313113	500 (2007 Size Standards)	307						
Industrial	Broadwoven Fabric Mills	313210	1000	4,672	D	713	2,729	738	D	
Industrial	Narrow Fabric Mills^	313221	500 (2007 Size Standards)	1,011						
Industrial	Textile and Fabric Finishing Mills	313310	1000	5,595	D	2,018	2,685	D		
Industrial	Broadwoven Fabric Finishing Mills^	313311	1000 (2007 Size Standards)	3,643						
Industrial	Fabric Coating Mills	313320	1000	2,489	D	1,277	D			
Industrial	Tire Cord and Tire Fabric Mills^	314992	1000 (2007 Size Standards)	875						
Industrial	Leather and Hide Tanning and Finishing	316110	500	1,657	D	855	671			
Industrial	Sawmills	321113	500	20,249	3,025	8,166	9,058			
Industrial	Wood Preservation	321114	500	4,619	D	3,055	D			
Industrial	Hardwood Veneer and Plywood Manufacturing	321211	500	2,730	D	D	1,924			
Industrial	Softwood Veneer and Plywood Manufacturing	321212	1250	4,550	D	D	2,936	939		
Industrial	Engineered Wood Member (except Truss) Manufacturing	321213	750	972	D	D	343			
Industrial	Reconstituted Wood Product Manufacturing	321219	750	6,862	D	D	5,184			
Industrial	Wood Window and Door Manufacturing	321911	1000	9,913	D	D	4,700	D	D	
Industrial	Cut Stock, Resawing Lumber, and Planing	321912	500	6,445	991	3,600	D			
Industrial	All Other Miscellaneous Wood Product Manufacturing	321999	500	5,466	1,285	3,065	1,115			
Industrial	Pulp Mills	322110	750	6,451	D	D	3,838	2,441		
Industrial	Paper (except Newsprint) Mills	322121	1250	47,457	D	D	15,266	18,226	12,621	
Industrial	Newsprint Mills	322122	750	2,932	D	D	D			
Industrial	Paperboard Mills	322130	1250	30,657	D	D	17,864	9,567	D	
Industrial	Corrugated and Solid Fiber Box Manufacturing	322211	1250	36,222	1,543	12,946	21,733			

(continued)

Table 6-3. Receipts by Industry and Enterprise Size: 2012 (in millions of 2017\$) (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standards (2017)	Receipts by Employee Size Categories (in millions of 2017\$)						
				Total	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Paper Bag and Coated and Treated Paper Manufacturing	322220	750	22,964	D	5,813	12,525	2,381	D	
Industrial	Coated and Laminated Paper Manufacturing^	322222	500 (2007 Size Standards)	13,815						
Industrial	Sanitary Paper Product Manufacturing	322291	1500	13,124	D	D	6,124	5,324	D	
Industrial	All Other Converted Paper Product Manufacturing	322299	500	5,613	D	2,848	D	D		
Industrial	Commercial Lithographic Printing^	323110	500 (2007 Size Standards)	42,665						
Industrial	Commercial Printing (except Screen and Books)	323111	500	72,756	D	24,416	29,510	6,365	D	
Industrial	Books Printing	323117	1250	4,564	D	D	2,661	613	D	
Industrial	Petroleum Refineries	324110	1500	864,374	D	4,873	231,700	D	239,731	
Industrial	Asphalt Shingle and Coating Materials Manufacturing	324122	750	11,598	D	5,210	D			
Industrial	All Other Petroleum and Coal Products Manufacturing	324199	500	5,738	D	2,592	D			
Industrial	Petrochemical Manufacturing	325110	1000	88,787	D	D	40,756	D		
Industrial	Industrial Gas Manufacturing	325120	1000	7,945	2,221	3,120	D	D		
Industrial	Synthetic Dye and Pigment Manufacturing	325130	1000	9,807	D	1,613	4,666	D		
Industrial	Inorganic Dye and Pigment Manufacturing^	325131	1000 (2007 Size Standards)	7,312						
Industrial	Synthetic Organic Dye and Pigment Manufacturing^	325132	750 (2007 Size Standards)	2,495						
Industrial	Other Basic Inorganic Chemical Manufacturing	325180	1000	37,355	D	11,636	14,834	3,021	D	
Industrial	Alkalies and Chlorine Manufacturing^	325181	1000 (2007 Size Standards)	8,717						
Industrial	Carbon Black Manufacturing^	325182	500 (2007 Size Standards)	2,543						
Industrial	All Other Basic Inorganic Chemical Manufacturing^	325188	1000 (2007 Size Standards)	26,095						
Industrial	Cyclic Crude and Intermediate Manufacturing^	325192	750 (2007 Size Standards)	7,703						
Industrial	Ethyl Alcohol Manufacturing	325193	1000	45,971	D	32,610	11,985			
Industrial	Cyclic Crude, Intermediate, and Gum and Wood Chemical Manufacturing	325194	1250	10,222	D	1,136	5,905	D		
Industrial	All Other Basic Organic Chemical Manufacturing	325199	1250	97,385	D	17,696	37,788	30,610	3,784	D
Industrial	Plastics Material and Resin Manufacturing	325211	1250	98,652	D	23,032	43,892	6,868	15,848	D
Industrial	Synthetic Rubber Manufacturing	325212	1000	10,089	D	2,952	D	293		
Industrial	Artificial and Synthetic Fibers and Filaments Manufacturing	325220	1000	9,302	D	788	5,541	2,281	D	

(continued)

Table 6-3. Receipts by Industry and Enterprise Size: 2012 (in millions of 2017\$) (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standards (2017)	Receipts by Employee Size Categories (in millions of 2017\$)						
				Total	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Cellulosic Organic Fiber Manufacturing [^]	325221	1000 (2007 Size Standards)	1,855						
Industrial	Noncellulosic Organic Fiber Manufacturing [^]	325222	1000 (2007 Size Standards)	7,447						
Industrial	Nitrogenous Fertilizer Manufacturing	325311	1000	10,233	D	2,880	D			
Industrial	Phosphatic Fertilizer Manufacturing	325312	750	12,552	D	D	D		D	
Industrial	Pesticide and Other Agricultural Chemical Manufacturing	325320	1000	16,358	D	3,095	8,773	D	D	
Industrial	Medicinal and Botanical Manufacturing	325411	1000	13,564	D	1,976	5,845	4,221	D	
Industrial	Pharmaceutical Preparation Manufacturing	325412	1250	147,083	D	D	66,479	20,657	17,420	D
Industrial	Biological Product (except Diagnostic) Manufacturing	325414	1250	29,202	D	D	7,733	9,223	7,857	D
Industrial	Paint and Coating Manufacturing	325510	1000	25,949	D	9,755	11,835	D		
Industrial	Adhesive Manufacturing	325520	500	13,051	1,272	6,627	5,153			
Industrial	Surface Active Agent Manufacturing	325613	750	12,609	D	3,004	D			
Industrial	Toilet Preparation Manufacturing	325620	1250	43,626	1,033	4,305	19,248	16,556	2,484	
Industrial	Explosives Manufacturing	325920	750	2,299	D	D	D			
Industrial	Custom Compounding of Purchased Resins	325991	500	11,122	D	4,972	4,863	D		
Industrial	Photographic Film, Paper, Plate, and Chemical Manufacturing	325992	1500	9,412	D	916	3,406	D	D	D
Industrial	All Other Miscellaneous Chemical Product and Preparation Manufacturing	325998	500	21,827	2,609	8,428	9,395	1,396		
Industrial	Plastics Packaging Film and Sheet (including Laminated) Manufacturing	326112	1000	13,766	385	3,960	7,653	D	D	
Industrial	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing	326113	750	18,947	D	4,550	11,143	1,530	D	
Industrial	Unlaminated Plastics Profile Shape Manufacturing	326121	500	6,630	D	1,689	3,633	D		
Industrial	Plastics Pipe and Pipe Fitting Manufacturing	326122	750	9,913	871	6,184	2,858			
Industrial	Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing	326130	500	3,802	D	1,066	D			
Industrial	Polystyrene Foam Product Manufacturing	326140	1000	9,323	D	3,053	4,064	1,230	D	
Industrial	Urethane and Other Foam Product (except Polystyrene) Manufacturing	326150	750	10,265	D	5,642	3,620	D		
Industrial	Plastics Plumbing Fixture Manufacturing	326191	750	3,193	D	1,146	D	D		
Industrial	All Other Plastics Product Manufacturing	326199	750	87,360	5,488	23,573	47,208	8,298	2,792	
Industrial	Tire Manufacturing (except Retreading)	326211	1500	21,817	D	D	2,756	5,183	11,937	D

(continued)

Table 6-3. Receipts by Industry and Enterprise Size: 2012 (in millions of 2017\$) (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standards (2017)	Receipts by Employee Size Categories (in millions of 2017\$)						
				Total	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Rubber and Plastics Hoses and Belting Manufacturing	326220	750	5,651	D	D	3,621	613		
Industrial	Rubber Product Manufacturing for Mechanical Use	326291	750	8,065	D	D	4,769	1,426		
Industrial	All Other Rubber Product Manufacturing	326299	500	11,860	781	3,657	5,241	D	D	
Industrial	Pottery, Ceramics, and Plumbing Fixture Manufacturing	327110	1000	2,322	D	583	1,061	D	D	
Industrial	Clay Building Material and Refractories Manufacturing	327120	750	5,536	467	2,681	2,388			
Industrial	Clay Refractory Manufacturing^	327124	500 (2007 Size Standards)	1,348						
Industrial	Flat Glass Manufacturing	327211	1000	3,411	D	D	D	D		
Industrial	Other Pressed and Blown Glass and Glassware Manufacturing	327212	1250	3,955	D	D	D	605	D	
Industrial	Cement Manufacturing	327310	1000	6,354	D	D	D			
Industrial	Lime Manufacturing	327410	750	2,539	D	D	D			
Industrial	Gypsum Product Manufacturing	327420	1500	3,972	D	2,232	D			
Industrial	Abrasive Product Manufacturing	327910	750	5,815	414	1,677	2,164	1,561		
Industrial	Mineral Wool Manufacturing	327993	1500	5,242	D	974	3,514	D		
Industrial	All Other Miscellaneous Nonmetallic Mineral Product Manufacturing	327999	500	4,454	D	2,353	D			
Industrial	Iron and Steel Mills and Ferroalloy Manufacturing	331110	1500	121,366	D	D	37,945	27,761	29,819	D
Industrial	Iron and Steel Mills^	331111	1000 (2007 Size Standards)	118,560						
Industrial	Electrometallurgical Ferroalloy Product Manufacturing^	331112	750 (2007 Size Standards)	2,806						
Industrial	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel	331210	1000	15,851	190	2,708	7,718	2,604	2,631	
Industrial	Rolled Steel Shape Manufacturing	331221	1000	6,018	D	2,307	D	D		
Industrial	Primary Aluminum Production^	331312	1000 (2007 Size Standards)	5,461						
Industrial	Alumina Refining and Primary Aluminum Production	331313	1000	7,001	D	789	2,216	3,968		
Industrial	Secondary Smelting and Alloying of Aluminum	331314	750	6,243	D	3,210	D			
Industrial	Aluminum Sheet, Plate, and Foil Manufacturing	331315	1250	17,309	D	D	4,159	9,485	D	
Industrial	Aluminum Extruded Product Manufacturing^	331316	750 (2007 Size Standards)	8,608						
Industrial	Other Aluminum Rolling, Drawing, and Extruding	331318	750	10,032	D	D	6,913	D		
Industrial	Nonferrous Metal (except Aluminum) Smelting and Refining	331410	1000	16,509	D	3,384	D	3,103		

(continued)

Table 6-3. Receipts by Industry and Enterprise Size: 2012 (in millions of 2017\$) (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standards (2017)	Receipts by Employee Size Categories (in millions of 2017\$)						
				Total	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Primary Smelting and Refining of Copper^	331411	1000 (2007 Size Standards)	6,626						
Industrial	Primary Smelting and Refining of Nonferrous Metal (except Copper and Aluminum)^	331419	750 (2007 Size Standards)	9,883						
Industrial	Copper Rolling, Drawing, Extruding, and Alloying	331420	1000	25,165	D	7,927	14,259	1,858	D	
Industrial	Copper Wire (except Mechanical) Drawing^	331422	1000 (2007 Size Standards)	8,038						
Industrial	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, and Extruding	331491	750	8,433	D	1,945	3,307	D	D	
Industrial	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	331492	750	16,169	D	4,702	10,052	D		
Industrial	Iron Foundries	331511	1000	11,790	D	D	6,423	3,152	D	
Industrial	Steel Foundries (except Investment)	331513	500	4,804	D	791	2,802	835	D	
Industrial	Aluminum Die-Casting Foundries^	331521	500 (2007 Size Standards)	6,209						
Industrial	Aluminum Foundries (except Die-Casting)	331524	500	3,056	D	919	1,910			
Industrial	Nonferrous Forging	332112	750	3,219	D	D	1,192	1,668	D	
Industrial	Metal Crown, Closure, and Other Metal Stamping (except Automotive)	332119	500	12,775	1,162	5,732	5,163	719	282	
Industrial	Hand and Edge Tool Manufacturing^	332212	500 (2007 Size Standards)	5,564						
Industrial	Prefabricated Metal Building and Component Manufacturing	332311	750	6,690	D	2,329	3,591	D	133	
Industrial	Fabricated Structural Metal Manufacturing	332312	500	28,679	D	12,416	10,837	D	D	
Industrial	Metal Window and Door Manufacturing	332321	750	10,624	D	3,139	4,951	1,397	D	
Industrial	Sheet Metal Work Manufacturing	332322	500	21,855	3,838	10,493	6,852			
Industrial	Metal Can Manufacturing	332431	1500	16,332	D	2,933	13,189			
Industrial	Other Metal Container Manufacturing	332439	500	3,865	288	1,773	1,110	694		
Industrial	Bolt, Nut, Screw, Rivet, and Washer Manufacturing	332722	500	10,681	705	3,437	5,718	821		
Industrial	Metal Heat Treating	332811	750	7,102	D	2,710	D			
Industrial	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers	332812	500	14,125	1,530	6,711	5,885			
Industrial	Electroplating, Plating, Polishing, Anodizing, and Coloring	332813	500	7,796	1,384	4,000	D	D		
Industrial	Other Fabricated Metal Manufacturing	332990	NA							
Industrial	Small Arms Ammunition Manufacturing	332992	1250	3,933	D	D	D	D	D	D

(continued)

Table 6-3. Receipts by Industry and Enterprise Size: 2012 (in millions of 2017\$) (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standards (2017)	Receipts by Employee Size Categories (in millions of 2017\$)						
				Total	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Ammunition (except Small Arms) Manufacturing	332993	1500	3,779	D	D	D	D		D
Industrial	All Other Miscellaneous Fabricated Metal Product Manufacturing	332999	750	15,520	2,572	6,120	6,086	742		
Industrial	Farm Machinery and Equipment Manufacturing	333111	1250	37,313	D	3,769	9,831	6,458	7,133	D
Industrial	Lawn and Garden Tractor and Home Lawn and Garden Equipment Manufacturing	333112	1500	8,257	D	D	2,035	3,157	D	
Industrial	Construction Machinery Manufacturing	333120	1250	45,480	D	4,027	9,164	8,345	17,329	D
Industrial	Mining Machinery and Equipment Manufacturing	333131	500	7,671	D	1,590	3,627	D	D	
Industrial	Printing Machinery and Equipment Manufacturing^	333293	500 (2007 Size Standards)	1,972						
Industrial	Photographic and Photocopying Equipment Manufacturing	333316	1000	2,315	D	693	D			
Industrial	Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing	333415	1250	33,057	827	3,251	14,594	6,286	8,099	
Industrial	Machine Tool (Metal Cutting Types) Manufacturing^	333512	500 (2007 Size Standards)	6,004						
Industrial	Machine Tool (Metal Forming Types) Manufacturing^	333513	500 (2007 Size Standards)	2,217						
Industrial	Turbine and Turbine Generator Set Units Manufacturing	333611	1500	18,238	D	D	4,078	5,705	5,970	D
Industrial	Other Engine Equipment Manufacturing	333618	1500	29,996	424	1,602	10,251	8,097	9,622	
Industrial	Overhead Traveling Crane, Hoist, and Monorail System Manufacturing	333923	1250	9,745	D	1,275	2,870	D	D	
Industrial	Welding and Soldering Equipment Manufacturing	333992	1250	6,193	389	1,214	1,902		2,687	
Industrial	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	334220	1250	32,613	1,192	3,337	9,155	1,861	4,736	12,332
Industrial	Electron Tube Manufacturing^	334411	750 (2007 Size Standards)	1,351						
Industrial	Bare Printed Circuit Board Manufacturing	334412	750	4,827	D	1,491	2,502	D		
Industrial	Semiconductor and Related Device Manufacturing	334413	1250	52,400	D	4,845	8,445	11,831	13,655	D
Industrial	Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use	334512	500	2,801	D	823	D	688	D	

(continued)

Table 6-3. Receipts by Industry and Enterprise Size: 2012 (in millions of 2017\$) (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standards (2017)	Receipts by Employee Size Categories (in millions of 2017\$)						
				Total	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Blank Magnetic and Optical Recording Media Manufacturing	334613	1000	301	D	D	D			
Industrial	Electric Lamp Bulb and Part Manufacturing	335110	1250	2,037	D	D	1,121	D		
Industrial	Household Laundry Equipment Manufacturing	335224	1250	D				D	D	D
Industrial	Other Major Household Appliance Manufacturing	335228	1000	4,901	D	D	D	3,245	D	
Industrial	Power, Distribution, and Specialty Transformer Manufacturing	335311	750	6,257	D	1,038	3,609	811	D	
Industrial	Motor and Generator Manufacturing	335312	1250	12,276	D	1,501	5,817	D	D	
Industrial	Storage Battery Manufacturing	335911	1250	7,045	D	D	3,954	343		D
Industrial	Current-Carrying Wiring Device Manufacturing	335931	500	7,449	D	1,625	3,841	1,080	D	
Industrial	Noncurrent-Carrying Wiring Device Manufacturing	335932	1000	6,679	D	988	3,573	D	D	
Industrial	Carbon and Graphite Product Manufacturing	335991	750	3,838	D	763	2,524	D		
Industrial	Automobile Manufacturing	336111	1500	117,256	D	D	D		30,978	81,053
Industrial	Light Truck and Utility Vehicle Manufacturing	336112	1500	131,693	D	D	166	D	D	86,547
Industrial	Heavy Duty Truck Manufacturing	336120	1500	31,861	D	D	D	5,607	17,995	D
Industrial	Motor Vehicle Body Manufacturing	336211	1000	12,330	D	2,793	5,434	2,541	D	
Industrial	Truck Trailer Manufacturing	336212	1000	8,598	D	1,466	3,584	1,879	D	
Industrial	Motor Vehicle Gasoline Engine and Engine Parts Manufacturing	336310	1000	31,720	D	1,533	8,444	18,109	D	
Industrial	Carburetor, Piston, Piston Ring, and Valve Manufacturing^	336311	500 (2007 Size Standards)	2,543						
Industrial	Gasoline Engine and Engine Parts Manufacturing^	336312	750 (2007 Size Standards)	29,177						
Industrial	Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing	336330	1000	12,925	D	873	6,911	3,102	D	D
Industrial	Motor Vehicle Brake System Manufacturing	336340	1250	11,728	D	1,025	7,316	1,714	D	
Industrial	Motor Vehicle Transmission and Power Train Parts Manufacturing	336350	1500	37,565	D	3,038	14,836	4,926	11,885	D
Industrial	Motor Vehicle Seating and Interior Trim Manufacturing	336360	1500	24,044	D	1,861	13,736	7,260	D	
Industrial	Motor Vehicle Metal Stamping	336370	1000	31,544	544	4,911	13,542	7,464	5,083	
Industrial	Other Motor Vehicle Parts Manufacturing	336390	1000	61,909	2,420	6,999	30,065	16,409	6,015	

(continued)

Table 6-3. Receipts by Industry and Enterprise Size: 2012 (in millions of 2017\$) (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standards (2017)	Receipts by Employee Size Categories (in millions of 2017\$)						
				Total	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	All Other Motor Vehicle Parts Manufacturing [^]	336399	750 (2007 Size Standards)	54,807						
Industrial	Aircraft Manufacturing	336411	1500	121,831	D	537	4,419	3,083	6,984	106,475
Industrial	Aircraft Engine and Engine Parts Manufacturing	336412	1500	40,025	430	1,650	12,223	4,435	4,827	16,461
Industrial	Other Aircraft Parts and Auxiliary Equipment Manufacturing	336413	1250	36,920	D	2,800	10,638	5,949	D	10,561
Industrial	Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing	336415	1250	4,538	D	D	D	D	2,863	
Industrial	Railroad Rolling Stock Manufacturing	336510	1500	18,497	D	2,128	4,607	3,469	D	D
Industrial	Ship Building and Repairing	336611	1250	26,890	640	1,906	5,068	2,470	2,336	14,470
Industrial	Boat Building	336612	1000	7,685	D	1,627	4,589	544	D	
Industrial	Military Armored Vehicle, Tank, and Tank Component Manufacturing	336992	1500	5,997	D	D	1,065	D	D	
Industrial	Wood Kitchen Cabinet and Countertop Manufacturing	337110	750	11,603	D	D	3,630	1,913	D	
Industrial	Upholstered Household Furniture Manufacturing	337121	1000	11,295	D	D	2,969	3,082	D	D
Industrial	Nonupholstered Wood Household Furniture Manufacturing	337122	750	4,430	D	1,101	1,490	D	D	
Industrial	Institutional Furniture Manufacturing	337127	500	5,091	D	1,666	2,656	D		
Industrial	Wood Office Furniture Manufacturing	337211	1000	2,785	D	508	1,567	D		
Industrial	Office Furniture (except Wood) Manufacturing	337214	1000	9,166	D	569	3,097	1,378	D	D
Industrial	Showcase, Partition, Shelving, and Locker Manufacturing	337215	500	7,215	D	2,259	3,559	620		
Industrial	Blind and Shade Manufacturing	337920	1000	1,903	D	493	932	D		
Industrial	Surgical and Medical Instrument Manufacturing	339112	1000	40,611	D	D	18,671	7,408	9,357	D
Industrial	Surgical Appliance and Supplies Manufacturing	339113	750	39,975	D	D	12,728	4,091	11,930	D
Industrial	Jewelry and Silverware Manufacturing	339910	500	8,191	1,255	1,940	D	D	D	
Industrial	Sporting and Athletic Goods Manufacturing	339920	750	11,093	1,010	2,626	4,045	1,134	2,278	
Industrial	Office Supplies (except Paper) Manufacturing	339940	750	2,989	D	734	1,825	D		
Industrial	Gasket, Packing, and Sealing Device Manufacturing	339991	500	7,099	D	1,976	3,567	727	D	
Industrial	Burial Casket Manufacturing	339995	1000	788	D	D	D	D		
Industrial	All Other Miscellaneous Manufacturing	339999	500	13,361	3,094	2,939	3,990	D	D	

(continued)

Table 6-3. Receipts by Industry and Enterprise Size: 2012 (in millions of 2017\$) (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standards (2017)	Receipts by Employee Size Categories (in millions of 2017\$)						
				Total	≤19	20~99	100~499	500~999	1000~2499	≥2500
Commercial	Grain and Field Bean Merchant Wholesalers	424510	200	249,442	110,303	95,417				
Commercial	Petroleum Bulk Stations and Terminals	424710	200	940,597	240,878	273,613				
Commercial	Scheduled Passenger Air Transportation	481111	1500	169,421	5,337	16,790				
Commercial	Line-Haul Railroads	482111	1500							
Energy	Pipeline Transportation of Crude Oil	486110	1500	7,331	2,129	3,202				
Energy	Pipeline Transportation of Natural Gas	486210	\$27.5 million	24,778	8,512	8,445				
Energy	Pipeline Transportation of Refined Petroleum Products	486910	1500	6,917	1,726					
Commercial	Support Activities for Rail Transportation	488210	\$15 million	5,213	977	2,229				
Commercial	Marine Cargo Handling	488320	\$38.5 million	9,597	680	2,537				
Commercial	General Warehousing and Storage	493110	\$27.5 million	18,989	5,117	7,866				
Commercial	Other Warehousing and Storage	493190	\$27.5 million	6,512	1,254	1,731				
Commercial	Lessors of Nonresidential Buildings (except Miniwarehouses)	531120	\$27.5 million	103,621	49,542	28,420				
Commercial	Testing Laboratories	541380	\$15 million	16,518	4,159	7,337				
Commercial	Research and Development in the Physical, Engineering and Life Sciences (except Nanotechnology and Biotechnology)^^^	541715	1000							
Commercial	All Other Support Services	561990	\$11 million	21,160	7,450	7,076				
Waste Treatment	Hazardous Waste Treatment and Disposal	562211	\$38.5 million	7,220	936	2,426				
Waste Treatment	Solid Waste Landfill	562212	\$38.5 million	5,536	2,247	2,492				
Waste Treatment	Solid Waste Combustors and Incinerators	562213	\$38.5 million	2,683	D	1,940				
Waste Treatment	Remediation Services	562910	\$20.5 million	15,299	3,015	6,133				
Educational Services	Colleges, Universities, and Professional Schools	611310	\$27.5 million							
Commercial	Amusement and Theme Parks	713110	\$38.5 million	13,578	255	458				
Commercial	Linen and Uniform Supply	812330	NA							
Commercial	Industrial Launderers	812332	\$38.5 million	7,642	715	3,773				

Notes:

Blank cells represent unreported data in the category. NA means it is not a valid 2012 NAICS code, thus SBA Size Standards are not available. When sub-categories are aggregated to the reported size categories, we treated unreported data as zero since no receipts were reported in the sub-category.

When data is reported as “D” (“Withheld to avoid disclosing data for individual companies”) or “Q” (“Revenue not collected at this level of detail for multi-establishment firms”) for a sub-category or category, we report “D” or “Q,” respectively, in the corresponding cell.

^ These Source Categories have a 2007 NAICS description because they are not defined in the 2012 Census. The 2012 Census provides establishment and revenue data for these source categories on 2007 NAICS basis, as a total figure for all establishments and revenues. It does not provide a breakdown by employment size.

The following NAICS report aggregate data for other top employee size categories and thus are not reported in the table: 221111, 221112, 221117, 221118, 221122, 221210, 221310, 221320, 221330, 424510, 424710, 481111, 486110, 486210, 486910, 488210, 488320, 493110, 493190, 531120, 541380, 561990, 562211, 562212, 562213, 562910, 713110, and 812332.

For the following NAICS, total receipts include establishments which operated entire year and not operated entire year whereas the breakdown into categories is done for establishments operated entire year: 221111, 221112, 221117, 221118, 221122, 221210, 221310, 221320, 221330, 424510, 424710, 481111, 486110, 486210, 486910, 488210, 488320, 493110, 493190, 531120, 541380, 561990, 562211, 562212, 562213, 562910, 713110, and 812332.

For NAICS 115114, Post harvest Crop Activities, the data are from County Business Patterns, but there are no revenue data. Geography Area Series: County Business Patterns by Employment Size Class more information 2012 Business Patterns.

332990 is not a valid 2012 NAICS code, therefore there are no data available in the 2012 Economic Census. Also, the size standards for this NAICS code are not available in the 2007, 2016 or 2017 SBA Size Standards. There is not even a description of this NAICS code in any of the SBA Size Standards. It could be a 2002 NAICS code. We found its description as a 2002 NAICS Code in the "Survey of Current Business: Volume 88, Issues 1–6, January 1, 2008, U.S. Department of Commerce.

482111 NAICS code (line-haul railroad) is excluded from the Economic Census therefore no data are available.

541715 is not a valid 2012 NAICS code, therefore there are no data available in the 2012 Economic Census. Four Industries in the 2012 NAICS structure have been expanded for 2017. 541712—Research and Development in the Physical, Engineering and Life Sciences (except Biotechnology) has been expanded to include 541713—Research and Development in Nanotechnology 541715—Research and Development in the Physical, Engineering and Life Sciences (except Nanotechnology).

812330 is not a valid 2012 NAICS code; therefore, there are no data available in the 2012 Economic Census. This code seems to be not a NAICS code but an IRS Statistics of Income (SOI) Program Industry Code for coding the industrial activities of corporations filing returns (https://www.irs.gov/irm/part1/irm_01-013-007). The SOI codes correspond to NAICS codes such as 812330 corresponds to 812332 Industrial Launderers and 812331 Linen Supply, but is a different code.

For NAICS 611310, Colleges and Universities establishment and employment data are from County Business Patterns but there are no revenue data. Geography Area Series: County Business Patterns by Employment Size Class more information 2012 Business Patterns.

NAICS 922140 (Correctional Institutions), NAICS 927110 (Space Research and Technology), NAICS 928110 (National Security) are government/public administration NAICS codes not covered by the Census.

NAICS 999999 is an unclassified code and therefore no data are available for it.

Sources: 2012 Economic Census, 2017 SBA Size Standards, SBA February 2016 Size Standards, SBA 2007 Size Standards, St. Louis Federal Reserve.

6.2 Developing Economic and Small Entity Regulatory Relief Impact Measures

We measured the impacts of the final rule on small entities in each sector using methods presented in the EPA’s Final SBREFA Guidance (U.S. EPA, 2006c). Because the rule covers a large number of sectors and primarily covers businesses, the analysis generated a set of sales tests (represented as potential avoided cost-to-receipt ratios)⁵⁷ for NAICS codes associated with the affected sectors.

Facilities that could potentially be affected by the final MM2A rule fall under different source categories selected for the MM2A analysis and the NAICS codes associated with these source categories. A particular NAICS code may be related to more than one source category; for instance, NAICS 324110 (Petroleum Refineries) is associated with five source categories: Asphalt, Refineries, Gasoline Distribution, Industrial Cooling Towers, and ICI Boilers and Process Heaters. Also, a particular source category may be associated with more than one NAICS code; for example, the source category ICI Boilers and Process Heaters is associated with 263 different NAICS codes. We aggregated the number of facilities that could potentially reclassify to area source status, the number of facilities in the category subject to MACT, and the net cost savings for the years in the analysis, across source categories to NAICS codes. Once we aggregated these to NAICS codes, we compared Census data on receipts and establishments by NAICS code with the cost savings and facilities data by NAICS code to obtain avoided cost-to-sales ratios.

Although the appropriate SBA size definition should be applied at the parent company (enterprise) level, data limitations allowed us only to compute and compare ratios for a *model establishment* for 6 *establishment size* ranges (*i.e.*, all categories, establishments with 19 or fewer employees, 20 to 99 employees, 100 to 499 employees, 500 to 999 employees, 1,000 to 2,499 employees, and 2,500+ employees). This approach allowed us to account for differences in establishment receipts between large and small establishments and differences in small business definitions across affected industries. It is also a conservative approach (that is, may overstate cost to receipts ratios) because an establishment’s parent company (the “enterprise”) may have other economic resources that could be used to cover the costs of the reporting program.

⁵⁷ The following metrics for other small entity economic impact measures (if applicable) would potentially include the following:

Small government (if applicable): “Revenue” test—annualized compliance cost as a percentage of annual government revenues.

Small nonprofits (if applicable): “Expenditure” test—annualized cost as a percentage of annual operating expenses.

6.3 Implementing the Sales Test to Measure Impacts on Industrial, Commercial and Other Sources under the Primary Scenario

The “sales test” is an approach that computes the annualized compliance costs as a share of sales for each company. The “sales test” is the methodology the EPA employs in economic impact analyses such as this one as opposed to a “profits test,” in which annualized compliance costs are calculated as a share of profits. This is because revenues or sales data are commonly available for entities affected by EPA regulations, and profits data normally made available are often not the true profits earned by firms because of accounting and tax considerations. Although screening-level analyses are often employed to estimate impacts to small businesses or entities as part of an analysis in compliance with the Regulatory Flexibility Act as amended by SBREFA, a screening-level analysis can also be employed in an economic impact analysis such as this one whose focus is on regulated companies. Given the general lack of information on the identity of owners of companies potentially affected by the final rule, the EPA implemented the recommended sales test by computing avoided cost-to-sales ratios for affected sectors at the establishment (or facility) level.⁵⁸

The ratios compare the average establishment’s total yearly avoided costs to the average establishment receipts for enterprises within several employment categories. The average entity avoided costs used to compute the sales test vary across sources but are the same across establishment size categories. As a result, the sales test will overstate the avoided cost-to-sales ratio for establishments owned by small businesses, because the reporting costs are likely lower than average entity estimates provided by the MM2A cost analysis. These avoided cost-to-sales ratios were calculated as follows.

First, for each source category, the industry net estimated cost savings excluding permitting costs to the state agency for year 1 (2021) and net estimated cost savings for year 5 (2025 and beyond) were calculated. This was done for years 1 and 5, because the EPA assumed that not all establishments would reclassify in the first year but over time, and a 5-year time frame would allow this reclassification to be complete. For year 1, the net cost savings included the facility’s permitting costs; for year 5, the net cost savings included only the supporting

⁵⁸ Typically, SBREFA impact assessments are conducted at the ultimate parent company level. As noted above, we assumed that the Census definition of enterprise is equivalent to the ultimate parent company. Theoretically, the comparison of compliance costs to sales should be conducted at the enterprise level. Because Census only provides data for typical establishments within various enterprise size categories, the EPA chose to compute the cost-to-sales ratio at the establishment (or facility level). The same ratio could be computed at the enterprise level by multiplying both the numerator and the denominator by the typical number of establishments per enterprise in the appropriate enterprise size categories. Using the Economic Census data on typical establishments means that the cost-to-sales ratios are identical, whether computed at the establishment level or at the enterprise level.

statement cost savings and estimated area source rule burdens, because there are no permitting costs in year 5. Because many of the source categories shared primary NAICS codes, we aggregated the year 1 net estimated cost savings excluding permitting costs to the state agency, and year 5 net estimated cost savings, and the number of facilities to obtain area source status. Because the EPA also assumed that all the reclassifications are evenly distributed over the years, the year 1 net estimated cost savings excluding permitting costs to the state agency represent the year 1 (2021) portion (25 percent) of these costs. Then we calculated the average estimated net cost savings per facility for year 1 (see “Average Cost per Entity” in Table 6-4) and year 5 (see “Average Cost per Entity” in Table 6-5).

Next, we calculated the average receipts per establishment for each NAICS code overall and for each size category by dividing the receipts (Table 6-3) by the number of establishments (Table 6-1). Frequently, receipts data are not available, so we were not able to calculate average receipts per establishment (or later, avoided cost-to-sales ratios) for certain size categories.

Finally, we calculated the year 1 and year 5 avoided cost-to-sales ratios for the primary scenario by dividing the average estimated net cost savings per facility by the average receipts per establishment for the overall NAICS and the establishment size categories. The year 1 avoided cost-to-sales ratios are reported in Table 6-4, and the year 5 avoided cost-to-sales ratios are reported in Table 6-5. The year 1 avoided cost-to-sales ratios range from -0.19 percent to less than 0.01 percent, with a median potential avoided cost-to-sales ratio of less than 0.01 percent across all employment size categories. The twenty-fifth percentile and seventy-fifth percentile avoided cost-to-sales ratio in year 1 are -0.01 percent and less than 0.01 percent respectively across all employment size categories. The year 5 avoided cost-to-sales ratios range from less than 0.01 percent to 5.68 percent, with a median potential avoided cost-to-sales ratio of 0.05 percent across all employment size categories. The twenty-fifth percentile and seventy-fifth percentile avoided cost-to-sales ratios in year 5 are 0.01 percent and 0.17 percent respectively across all employment size categories.

Because facilities according to our analysis do not face permitting costs in year 5 and all reclassifications have taken place, the cost savings are larger in year 5 than year 1, and the resulting avoided cost-to-sales ratios are larger. For example, NAICS 337110 (Wood Kitchen Cabinet and Countertop Manufacturing) has an overall year 1 avoided cost-to-sales ratio of -0.06 percent and an overall year 5 avoided cost-to-sales ratio of 0.52 percent. Some NAICS codes that have less than 0.01 percent ratios in year 1 have positive ratios in year 5, such as NAICS 327310 (Cement Manufacturing), which has an overall avoided cost-to-sales ratio of less than 0.01 percent in year 1 and 0.09 percent in year 5.

As discussed above, we conducted a small entity analysis for both year 1 and year 5 impact estimates. In year 1, some small size categories have very small negative avoided cost-to-sales ratios. The “fewer than or equal to 19 employees” category of NAICS 424710 (Petroleum Bulk Stations and Terminals) has a less than 0.01 percent avoided cost-to-sales ratio, and the “20 to 99 employees” category of NAICS 325120 (Industrial Gas Manufacturing) has a less than 0.01 percent avoided cost-to-sales ratio. However, there are other cases of more negative economic impacts in year 1 for small size categories, even though these impacts are small in absolute terms. In year 1, the “fewer than or equal to 19 employees” category of NAICS 562211 (Hazardous Waste Treatment and Disposal), has a -0.06 percent avoided cost-to-sales ratio. Establishments in this size category are considered small businesses for NAICS 562211 because the average receipts per establishment in 2017 dollars is \$1.8 million which is less than the SBA size standard of \$38.5 million for this NAICS code. For the same size category, NAICS 493110 (General Warehousing and Storage) has an avoided cost-to-sales ratio of -0.11 percent in year 1. Establishments in the “fewer than or equal to 19 employees” size category for NAICS 493110 are treated as small businesses for purposes of this analysis because the average receipts per establishment in 2017 dollars is \$0.9 million which is less than the SBA size standard of \$27.5 million for this NAICS code.

In year 5, small entities generally have larger cost savings and the resulting avoided cost-to-sales ratios are larger. For example, for NAICS 213112 (Support Activities for Oil and Gas Operations) the “fewer than or equal to 19 employees” category has an avoided cost-to-sales ratio of -0.05 percent in year 1 and in year 5, the ratio is 0.69 percent. Establishments in the “fewer than or equal to 19 employees” size category for NAICS 213112 are considered small businesses for purposes of this analysis because the average receipts per establishment is \$2.2 million in 2017 dollars, which is less than the SBA size standard of \$38.5 million. For NAICS 562211, for the “fewer than or equal to 19 employees” category, the avoided cost-to-sales ratio in year 5 is 4.95 percent.

Smaller entities having larger impacts in some cases is probably a result of smaller establishments generally having lower average receipts per establishment than larger establishments and the assumption that the average cost per entity is approximately the same for different establishment sizes within a NAICS code.

As is evident from Tables 6-4 and 6-5, we did not calculate and report avoided cost-to-sales ratios in certain cases, because we used the 2012 Economic Census to collect and organize data on number of establishments, employment, and receipts for affected sources represented by six-digit NAICS codes. However, because of confidentiality issues, some data values were not

available or were reported with a range of values. Also, some source categories are not completely covered by the 2012 Economics Census. Table 7-1 in Section 7 describes the data limitations for the source categories not completely covered by the 2012 Economic Census.

These data limitations prevented us from reporting avoided cost-to-sales ratios entirely for some NAICS codes and for every employment size category for some NAICS codes.

The number of establishments was not reported for the larger employee size categories for some NAICS codes. For example, for NAICS 221320 (Sewage Treatment Facilities) the number of establishments was only reported for “500+ employees” instead of separately for “500 to 999 employees,” “1,000 to 2,499 employees,” and “2,500+ employees.” Similarly, for NAICS codes 486210 (Pipeline Transportation of Natural Gas), 493110 (General Warehousing and Storage), and 562211 (Hazardous Waste Treatment and Disposal), the number of establishments was only reported for “100+ employees.” This issue arises for employment and receipts data as well as for these NAICS codes in the same employee size categories. Therefore, we were not able to compute impact estimates for these size categories for these NAICS codes.

Regarding the reporting of employment data in the 2012 Economic Census, an issue is that many categories are reported in ranges. For example, the “2,500+ employees” category for NAICS 211111 (Crude Petroleum and Natural Gas Extraction) is simply reported as “10,000–24,999” employees. Employment does not directly affect the calculation of the impact estimates, so this limitation is not an issue for the avoided cost-to-sales ratios.

For receipts data, many data values are not available especially for the different employee size categories. More commonly, unavailable data are reported as “Q,” meaning “Revenue not collected at this level of detail for multi-establishment firms,” or “D,” meaning “Withheld to avoid disclosing data for individual companies.” Receipts data are essential to calculating the avoided cost-to-sales ratios, but because many data values are unavailable, we are limited in which avoided cost-to-sales ratios we can calculate and report. Also, receipts data are defined differently depending on the NAICS codes.

The underlying establishment and receipts data are a limiting factor because if either of these measures is not reported for a certain category, we cannot calculate the average receipts per establishment, which is needed for the avoided cost-to-sales ratio calculation. However, there are cases where avoided cost-to-sales ratios are not reported because zero facilities are estimated to obtain area source status; therefore, there are no facilities to calculate the average cost per entity.

The public administration NAICS have facilities estimated to obtain area source status, but because these NAICS codes comprise government facilities, the relevant sales data (establishments and revenue) are not available for these NAICS codes. Similarly, NAICS 999999 is an unclassified code, and the 2012 Economic Census does not provide establishments or revenue data for this NAICS code. Therefore, no data or cost-to-sales ratios are presented for them. All of this data can be found in final MM2ARIAdataspreadsheetAugust_2020.xls that can be found in the docket for this rulemaking.

Table 6-4. Avoided Cost to Sales in Year 1 under the PRIMARY SCENARIO

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Agriculture	Postharvest Crop Activities (except Cotton Ginning)	115114	\$27.5 million		*, **	*, **	*, **	*, **	*, **	*, **	*, **
Energy	Crude Petroleum and Natural Gas Extraction	211111	1250 (Feb 2016 Size Standards)	-\$1,022	0.00%	*	0.00%	0.00%	0.00%	0.00%	*
Energy	Natural Gas Liquid Extraction	211112	750 (Feb 2016 Size Standards)	-\$1,022	0.00%	0.00%	0.00%	0.00%	0.00%	*	*
Industrial	Iron Ore Mining	212210	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Lead Ore and Zinc Ore Mining	212231	750 (Feb 2016 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Copper Ore and Nickel Ore Mining	212234	1500 (Feb 2016 Size Standards)		**	*, **	*, **	*, **	**	*, **	*, **
Industrial	All Other Metal Ore Mining	212299	750		**	*, **	*, **	**	*, **	*, **	*, **
Industrial	Industrial Sand Mining	212322	500		**	**	**	**	*, **	*, **	*, **
Industrial	Kaolin and Ball Clay Mining	212324	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Potash, Soda, and Borate Mineral Mining	212391	750		**	*, **	*, **	*, **	**	*, **	*, **
Industrial	All Other Nonmetallic Mineral Mining	212399	500		**	*, **	**	*, **	*, **	*, **	*, **
Energy	Support Activities for Oil and Gas Operations	213112	\$38.5 million	-\$1,022	-0.01%	-0.05%	-0.01%	0.00%	0.00%	0.00%	*
Utilities	Hydroelectric Power Generation	221111	500	-\$1,022	-0.02%	*	*	*	*	*	*
Utilities	Fossil Fuel Electric Power Generation	221112	750	-\$1,022	0.00%	*	*	*	*	*	*
Utilities	Biomass Electric Power Generation	221117	250	-\$1,022	-0.01%	*	*	*	*	*	*
Utilities	Other Electric Power Generation	221118	250	-\$1,022	-0.04%	*	*	*	*	*	*
Utilities	Other Electric Power Generation^	221119	4 million MWH (2007 Size Standards)	-\$1,022	-0.01%	*	*	*	*	*	*
Utilities	Electric Power Distribution	221122	1,000	-\$1,022	0.00%	*	*	*	*	*	*
Utilities	Natural Gas Distribution	221210	1,000	-\$1,022	0.00%	*	*	*	*	*	*
Utilities	Water Supply and Irrigation Systems	221310	\$27.5 million	-\$1,022	-0.04%	*	*	*	*	*	*
Utilities	Sewage Treatment Facilities	221320	\$20.5 million	-\$1,022	-0.05%	*	*	*	*	*	*
Utilities	Steam and Air-Conditioning Supply	221330	\$15 million	-\$1,022	-0.01%	*	*	*	*	*	*
Industrial	Other Animal Food Manufacturing	311119	500		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Wet Corn Milling	311221	1,250		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Soybean Processing^	311222	500 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Other Oilseed Processing^	311223	1000 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Soybean and Other Oilseed Processing	311224	1,000	-\$1,022	0.00%	*	0.00%	*	*	*	*
Industrial	Fats and Oils Refining and Blending	311225	1,000		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Beet Sugar Manufacturing	311313	750		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Cane Sugar Manufacturing	311314	1,000		**	*, **	*, **	**	*, **	*, **	*, **

(continued)

Table 6-4. Avoided Cost to Sales in Year 1 under the PRIMARY SCENARIO (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Frozen Fruit, Juice, and Vegetable Manufacturing	311411	1,000		**	, **	, **	**	, **	, **	, **
Industrial	Fruit and Vegetable Canning	311421	1,000		**	, **	**	**	, **	, **	, **
Industrial	Specialty Canning	311422	1,250		**	, **	, **	, **	**	, **	, **
Industrial	Cheese Manufacturing	311513	1,250		**	**	**	**	**	**	, **
Industrial	Dry, Condensed, and Evaporated Dairy Product Manufacturing	311514	750		**	, **	**	**	, **	, **	, **
Industrial	Rendering and Meat Byproduct Processing	311613	750		**	, **	**	**	, **	, **	, **
Industrial	Commercial Bakeries	311812	1,000		**	, **	**	**	**	, **	, **
Industrial	Other Snack Food Manufacturing	311919	1,250		**	, **	**	**	, **	, **	, **
Industrial	Coffee and Tea Manufacturing	311920	750		**	, **	**	**	, **	, **	, **
Industrial	Flavoring Syrup and Concentrate Manufacturing	311930	1,000		**	, **	, **	**	, **	, **	, **
Industrial	Spice and Extract Manufacturing	311942	500		**	, **	**	**	, **	, **	, **
Industrial	All Other Miscellaneous Food Manufacturing	311999	500		**	, **	**	**	**	, **	, **
Industrial	Breweries	312120	1,250	-\$1,022	0.00%	*	-0.01%	*	*	*	*
Industrial	Distilleries	312140	1,000		**	, **	, **	, **	, **	, **	, **
Industrial	Tobacco Manufacturing	312230	1,500		**	, **	, **	**	**	, **	, **
Industrial	Yarn Spinning Mills^	313111	500 (2007 Size Standards)	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Thread Mills^	313113	500 (2007 Size Standards)	-\$1,022	-0.02%	*	*	*	*	*	*
Industrial	Broadwoven Fabric Mills	313210	1,000	-\$1,022	-0.01%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Narrow Fabric Mills^	313221	500 (2007 Size Standards)	-\$1,022	-0.01%	*	*	*	*	*	*
Industrial	Textile and Fabric Finishing Mills	313310	1,000	-\$1,022	-0.02%	*	-0.01%	0.00%	*	*	*
Industrial	Broadwoven Fabric Finishing Mills^	313311	1000 (2007 Size Standards)	-\$1,022	-0.01%	*	*	*	*	*	*
Industrial	Fabric Coating Mills	313320	1,000	-\$1,022	-0.01%	*	-0.01%	*	*	*	*
Industrial	Tire Cord and Tire Fabric Mills^	314992	1000 (2007 Size Standards)		**	, **	, **	, **	, **	, **	, **
Industrial	Leather and Hide Tanning and Finishing	316110	500	-\$1,022	-0.01%	*	0.00%	0.00%	*	*	*
Industrial	Sawmills	321113	500	-\$1,022	-0.01%	-0.07%	-0.01%	0.00%	*	*	*
Industrial	Wood Preservation	321114	500		**	, **	**	, **	, **	, **	, **
Industrial	Hardwood Veneer and Plywood Manufacturing	321211	500		**	, **	, **	**	, **	, **	, **
Industrial	Softwood Veneer and Plywood Manufacturing	321212	1,250	-\$1,022	0.00%	*	*	0.00%	0.00%	*	*
Industrial	Engineered Wood Member (except Truss) Manufacturing	321213	750	-\$1,022	-0.01%	*	*	0.00%	*	*	*

(continued)

Table 6-4. Avoided Cost to Sales in Year 1 under the PRIMARY SCENARIO (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Reconstituted Wood Product Manufacturing	321219	750	-\$1,022	0.00%	*	*	0.00%	*	*	*
Industrial	Wood Window and Door Manufacturing	321911	1,000		**	*, **	*, **	**	*, **	*, **	*, **
Industrial	Cut Stock, Resawing Lumber, and Planing	321912	500		**	**	**	*, **	*, **	*, **	*, **
Industrial	All Other Miscellaneous Wood Product Manufacturing	321999	500		**	**	**	**	*, **	*, **	*, **
Industrial	Pulp Mills	322110	750	-\$1,022	0.00%	*	*	0.00%	0.00%	*	*
Industrial	Paper (except Newsprint) Mills	322121	1,250	-\$1,022	0.00%	*	*	0.00%	0.00%	0.00%	*
Industrial	Newsprint Mills	322122	750	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Paperboard Mills	322130	1,250	-\$1,022	0.00%	*	*	0.00%	0.00%	*	*
Industrial	Corrugated and Solid Fiber Box Manufacturing	322211	1,250	-\$1,022	0.00%	-0.03%	0.00%	0.00%	*	*	*
Industrial	Paper Bag and Coated and Treated Paper Manufacturing	322220	750	-\$1,022	0.00%	*	0.00%	0.00%	0.00%	*	*
Industrial	Coated and Laminated Paper Manufacturing^	322222	500 (2007 Size Standards)	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Sanitary Paper Product Manufacturing	322291	1,500		**	*, **	*, **	**	**	*, **	*, **
Industrial	All Other Converted Paper Product Manufacturing	322299	500		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Commercial Lithographic Printing^	323110	500 (2007 Size Standards)	-\$1,022	-0.03%	*	*	*	*	*	*
Industrial	Commercial Printing (except Screen and Books)	323111	500	-\$1,022	-0.03%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Books Printing	323117	1,250	-\$1,022	-0.01%	*	*	0.00%	0.00%	*	*
Industrial	Petroleum Refineries	324110	1,500	-\$1,035	0.00%	*	0.00%	0.00%	*	0.00%	*
Industrial	Asphalt Shingle and Coating Materials Manufacturing	324122	750		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	All Other Petroleum and Coal Products Manufacturing	324199	500		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Petrochemical Manufacturing	325110	1,000	-\$1,022	0.00%	*	*	0.00%	*	*	*
Industrial	Industrial Gas Manufacturing	325120	1,000	-\$1,022	-0.01%	-0.01%	0.00%	*	*	*	*
Industrial	Synthetic Dye and Pigment Manufacturing	325130	1,000		**	*, **	**	**	*, **	*, **	*, **
Industrial	Inorganic Dye and Pigment Manufacturing^	325131	1000 (2007 Size Standards)	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Synthetic Organic Dye and Pigment Manufacturing^	325132	750 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Other Basic Inorganic Chemical Manufacturing	325180	1,000	-\$1,022	0.00%	*	0.00%	0.00%	0.00%	*	*
Industrial	Alkalies and Chlorine Manufacturing^	325181	1000 (2007 Size Standards)	-\$1,022	0.00%	*	*	*	*	*	*

(continued)

Table 6-4. Avoided Cost to Sales in Year 1 under the PRIMARY SCENARIO (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Carbon Black Manufacturing^	325182	500 (2007 Size Standards)	-\$1,028	0.00%	*	*	*	*	*	*
Industrial	All Other Basic Inorganic Chemical Manufacturing^	325188	1000 (2007 Size Standards)	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Cyclic Crude and Intermediate Manufacturing^	325192	750 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Ethyl Alcohol Manufacturing	325193	1,000	-\$1,022	0.00%	*	0.00%	0.00%	*	*	*
Industrial	Cyclic Crude, Intermediate, and Gum and Wood Chemical Manufacturing	325194	1,250		**	*, **	**	**	*, **	*, **	*, **
Industrial	All Other Basic Organic Chemical Manufacturing	325199	1,250	-\$1,022	0.00%	*	0.00%	0.00%	0.00%	0.00%	*
Industrial	Plastics Material and Resin Manufacturing	325211	1,250	-\$1,023	0.00%	*	0.00%	0.00%	0.00%	0.00%	*
Industrial	Synthetic Rubber Manufacturing	325212	1,000	-\$1,022	0.00%	*	0.00%	*	*	*	*
Industrial	Artificial and Synthetic Fibers and Filaments Manufacturing	325220	1,000	-\$1,022	0.00%	*	0.00%	0.00%	0.00%	*	*
Industrial	Cellulosic Organic Fiber Manufacturing^	325221	1000 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Noncellulosic Organic Fiber Manufacturing^	325222	1000 (2007 Size Standards)	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Nitrogenous Fertilizer Manufacturing	325311	1,000	-\$1,022	0.00%	*	0.00%	*	*	*	*
Industrial	Phosphatic Fertilizer Manufacturing	325312	750	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Pesticide and Other Agricultural Chemical Manufacturing	325320	1,000	-\$1,022	0.00%	*	0.00%	0.00%	*	*	*
Industrial	Medicinal and Botanical Manufacturing	325411	1,000	-\$1,022	0.00%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Pharmaceutical Preparation Manufacturing	325412	1,250	-\$1,022	0.00%	*	*	0.00%	0.00%	0.00%	*
Industrial	Biological Product (except Diagnostic) Manufacturing	325414	1,250		**	*, **	*, **	**	**	**	*, **
Industrial	Paint and Coating Manufacturing	325510	1,000	-\$1,022	0.00%	*	0.00%	0.00%	*	*	*
Industrial	Adhesive Manufacturing	325520	500	-\$1,022	0.00%	-0.02%	0.00%	0.00%	*	*	*
Industrial	Surface Active Agent Manufacturing	325613	750		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Toilet Preparation Manufacturing	325620	1,250		**	**	**	**	**	**	*, **
Industrial	Explosives Manufacturing	325920	750		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Custom Compounding of Purchased Resins	325991	500	-\$1,022	0.00%	*	0.00%	0.00%	*	*	*
Industrial	Photographic Film, Paper, Plate, and Chemical Manufacturing	325992	1,500	-\$1,022	0.00%	*	0.00%	0.00%	*	*	*
Industrial	All Other Miscellaneous Chemical Product and Preparation Manufacturing	325998	500	-\$1,022	-0.01%	-0.03%	0.00%	0.00%	0.00%	*	*

(continued)

Table 6-4. Avoided Cost to Sales in Year 1 under the PRIMARY SCENARIO (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Plastics Packaging Film and Sheet (including Laminated) Manufacturing	326112	1,000	-\$1,022	0.00%	-0.03%	0.00%	0.00%	*	*	*
Industrial	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing	326113	750	-\$1,022	0.00%	*	0.00%	0.00%	0.00%	*	*
Industrial	Unlaminated Plastics Profile Shape Manufacturing	326121	500		**	*, **	**	**	*, **	*, **	*, **
Industrial	Plastics Pipe and Pipe Fitting Manufacturing	326122	750		**	**	**	**	*, **	*, **	*, **
Industrial	Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing	326130	500	-\$1,022	-0.01%	*	-0.01%	*	*	*	*
Industrial	Polystyrene Foam Product Manufacturing	326140	1,000		**	*, **	**	**	**	*, **	*, **
Industrial	Urethane and Other Foam Product (except Polystyrene) Manufacturing	326150	750	-\$1,046	-0.01%	*	-0.01%	0.00%	*	*	*
Industrial	Plastics Plumbing Fixture Manufacturing	326191	750		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	All Other Plastics Product Manufacturing	326199	750	-\$1,022	-0.01%	-0.07%	-0.01%	0.00%	0.00%	0.00%	*
Industrial	Tire Manufacturing (except Retreading)	326211	1,500	-\$1,004	0.00%	*	*	0.00%	0.00%	0.00%	*
Industrial	Rubber and Plastics Hoses and Belting Manufacturing	326220	750	-\$1,022	0.00%	*	*	0.00%	0.00%	*	*
Industrial	Rubber Product Manufacturing for Mechanical Use	326291	750		**	*, **	*, **	**	**	*, **	*, **
Industrial	All Other Rubber Product Manufacturing	326299	500	-\$1,022	-0.01%	-0.05%	-0.01%	0.00%	*	*	*
Industrial	Pottery, Ceramics, and Plumbing Fixture Manufacturing	327110	1,000	-\$1,321	-0.04%	*	-0.02%	0.00%	*	*	*
Industrial	Clay Building Material and Refractories Manufacturing	327120	750	-\$1,022	-0.01%	-0.06%	-0.01%	0.00%	*	*	*
Industrial	Clay Refractory Manufacturing^	327124	500 (2007 Size Standards)	-\$1,175	-0.01%	*	*	*	*	*	*
Industrial	Flat Glass Manufacturing	327211	1,000		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Other Pressed and Blown Glass and Glassware Manufacturing	327212	1,250	-\$1,022	-0.01%	*	*	*	0.00%	*	*
Industrial	Cement Manufacturing	327310	1,000	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Lime Manufacturing	327410	750	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Gypsum Product Manufacturing	327420	1,500		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Abrasive Product Manufacturing	327910	750	-\$1,022	-0.01%	-0.04%	-0.01%	0.00%	0.00%	*	*
Industrial	Mineral Wool Manufacturing	327993	1,500	-\$1,022	-0.01%	*	-0.01%	0.00%	*	*	*
Industrial	All Other Miscellaneous Nonmetallic Mineral Product Manufacturing	327999	500		**	*, **	**	*, **	*, **	*, **	*, **

(continued)

Table 6-4. Avoided Cost to Sales in Year 1 under the PRIMARY SCENARIO (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Iron and Steel Mills and Ferroalloy Manufacturing	331110	1,500	-\$1,022	0.00%	*	*	0.00%	0.00%	0.00%	*
Industrial	Iron and Steel Mills^	331111	1000 (2007 Size Standards)	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Electrometallurgical Ferroalloy Product Manufacturing^	331112	750 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel	331210	1,000	-\$1,022	0.00%	-0.02%	0.00%	0.00%	0.00%	0.00%	*
Industrial	Rolled Steel Shape Manufacturing	331221	1,000	-\$1,022	0.00%	*	0.00%	*	*	*	*
Industrial	Primary Aluminum Production^	331312	1000 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Alumina Refining and Primary Aluminum Production	331313	1,000	-\$1,022	0.00%	*	0.00%	0.00%	0.00%	*	*
Industrial	Secondary Smelting and Alloying of Aluminum	331314	750	-\$1,022	0.00%	*	0.00%	*	*	*	*
Industrial	Aluminum Sheet, Plate, and Foil Manufacturing	331315	1,250	-\$1,022	0.00%	*	*	0.00%	0.00%	*	*
Industrial	Aluminum Extruded Product Manufacturing^	331316	750 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Other Aluminum Rolling, Drawing, and Extruding	331318	750		**	*, **	*, **	**	*, **	*, **	*, **
Industrial	Nonferrous Metal (except Aluminum) Smelting and Refining	331410	1,000		**	*, **	**	*, **	**	*, **	*, **
Industrial	Primary Smelting and Refining of Copper^	331411	1000 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Primary Smelting and Refining of Nonferrous Metal (except Copper and Aluminum)^	331419	750 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Copper Rolling, Drawing, Extruding, and Alloying	331420	1,000		**	*, **	**	**	**	*, **	*, **
Industrial	Copper Wire (except Mechanical) Drawing^	331422	1000 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, and Extruding	331491	750	-\$1,022	0.00%	*	0.00%	0.00%	*	*	*
Industrial	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	331492	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Iron Foundries	331511	1,000	-\$1,022	0.00%	*	*	0.00%	0.00%	*	*
Industrial	Steel Foundries (except Investment)	331513	500		**	*, **	**	**	**	*, **	*, **
Industrial	Aluminum Die-Casting Foundries^	331521	500 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Aluminum Foundries (except Die-Casting)	331524	500		**	*, **	**	**	*, **	*, **	*, **

(continued)

Table 6-4. Avoided Cost to Sales in Year 1 under the PRIMARY SCENARIO (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Nonferrous Forging	332112	750	-\$1,022	0.00%	*	*	0.00%	0.00%	*	*
Industrial	Metal Crown, Closure, and Other Metal Stamping (except Automotive)	332119	500	-\$1,022	-0.01%	-0.07%	-0.01%	0.00%	0.00%	*	*
Industrial	Hand and Edge Tool Manufacturing^	332212	500 (2007 Size Standards)	-\$1,022	-0.02%	*	*	*	*	*	*
Industrial	Prefabricated Metal Building and Component Manufacturing	332311	750	-\$1,022	-0.01%	*	-0.01%	0.00%	*	*	*
Industrial	Fabricated Structural Metal Manufacturing	332312	500	-\$1,022	-0.01%	*	-0.01%	0.00%	*	*	*
Industrial	Metal Window and Door Manufacturing	332321	750	-\$1,022	-0.01%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Sheet Metal Work Manufacturing	332322	500	-\$1,022	-0.02%	-0.07%	-0.01%	0.00%	*	*	*
Industrial	Metal Can Manufacturing	332431	1,500	-\$1,022	0.00%	*	0.00%	0.00%	*	*	*
Industrial	Other Metal Container Manufacturing	332439	500	-\$1,022	-0.01%	-0.07%	-0.01%	0.00%	0.00%	*	*
Industrial	Bolt, Nut, Screw, Rivet, and Washer Manufacturing	332722	500	-\$1,022	-0.01%	-0.07%	-0.01%	0.00%	0.00%	*	*
Industrial	Metal Heat Treating	332811	750	-\$1,022	-0.01%	*	-0.01%	*	*	*	*
Industrial	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers	332812	500	-\$1,022	-0.02%	-0.12%	-0.01%	0.00%	*	*	*
Industrial	Electroplating, Plating, Polishing, Anodizing, and Coloring	332813	500	-\$1,022	-0.03%	-0.12%	-0.02%	*	*	*	*
Industrial	Other Fabricated Metal Manufacturing	332990	#N/A	-\$1,022	*	*	*	*	*	*	*
Industrial	Small Arms Ammunition Manufacturing	332992	1,250	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Ammunition (except Small Arms) Manufacturing	332993	1,500	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	All Other Miscellaneous Fabricated Metal Product Manufacturing	332999	750	-\$1,022	-0.02%	-0.11%	-0.01%	0.00%	0.00%	*	*
Industrial	Farm Machinery and Equipment Manufacturing	333111	1,250	-\$1,022	0.00%	*	-0.01%	0.00%	0.00%	0.00%	*
Industrial	Lawn and Garden Tractor and Home Lawn and Garden Equipment Manufacturing	333112	1,500		**	*, **	*, **	**	**	*, **	*, **
Industrial	Construction Machinery Manufacturing	333120	1,250	-\$1,022	0.00%	*	-0.01%	0.00%	0.00%	0.00%	*
Industrial	Mining Machinery and Equipment Manufacturing	333131	500		**	*, **	**	**	*, **	*, **	*, **
Industrial	Printing Machinery and Equipment Manufacturing^	333293	500 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Photographic and Photocopying Equipment Manufacturing	333316	1,000		**	*, **	**	*, **	*, **	*, **	*, **

(continued)

Table 6-4. Avoided Cost to Sales in Year 1 under the PRIMARY SCENARIO (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing	333415	1,250		**	**	**	**	**	**	*, **
Industrial	Machine Tool (Metal Cutting Types) Manufacturing^	333512	500 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Machine Tool (Metal Forming Types) Manufacturing^	333513	500 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Turbine and Turbine Generator Set Units Manufacturing	333611	1,500		**	*, **	*, **	**	**	**	*, **
Industrial	Other Engine Equipment Manufacturing	333618	1,500	-\$1,022	0.00%	-0.04%	0.00%	0.00%	0.00%	0.00%	*
Industrial	Overhead Traveling Crane, Hoist, and Monorail System Manufacturing	333923	1,250		**	*, **	**	**	*, **	*, **	*, **
Industrial	Welding and Soldering Equipment Manufacturing	333992	1,250		**	**	**	**	*, **	**	*, **
Industrial	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	334220	1,250		**	**	**	**	**	**	**
Industrial	Electron Tube Manufacturing^	334411	750 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Bare Printed Circuit Board Manufacturing	334412	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Semiconductor and Related Device Manufacturing	334413	1,250	-\$1,014	0.00%	*	0.00%	0.00%	0.00%	0.00%	*
Industrial	Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use	334512	500		**	*, **	**	*, **	**	*, **	*, **
Industrial	Blank Magnetic and Optical Recording Media Manufacturing	334613	1,000		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Electric Lamp Bulb and Part Manufacturing	335110	1,250	-\$1,022	0.00%	*	*	0.00%	*	*	*
Industrial	Household Laundry Equipment Manufacturing	335224	1,250	-\$1,022	*	*	*	*	*	*	*
Industrial	Other Major Household Appliance Manufacturing	335228	1,000	-\$1,022	0.00%	*	*	*	0.00%	*	*
Industrial	Power, Distribution, and Specialty Transformer Manufacturing	335311	750	-\$1,022	0.00%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Motor and Generator Manufacturing	335312	1,250	-\$1,022	0.00%	*	-0.01%	0.00%	*	*	*
Industrial	Storage Battery Manufacturing	335911	1,250	-\$1,022	0.00%	*	*	0.00%	0.00%	*	*
Industrial	Current-Carrying Wiring Device Manufacturing	335931	500	-\$1,022	-0.01%	*	-0.01%	0.00%	0.00%	*	*

(continued)

Table 6-4. Avoided Cost to Sales in Year 1 under the PRIMARY SCENARIO (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Noncurrent-Carrying Wiring Device Manufacturing	335932	1,000	-\$1,022	0.00%	*	0.00%	0.00%	*	*	*
Industrial	Carbon and Graphite Product Manufacturing	335991	750	-\$1,022	0.00%	*	-0.01%	0.00%	*	*	*
Industrial	Automobile Manufacturing	336111	1,500	-\$1,022	0.00%	*	*	*	*	0.00%	0.00%
Industrial	Light Truck and Utility Vehicle Manufacturing	336112	1,500	-\$1,022	0.00%	*	*	0.00%	*	*	0.00%
Industrial	Heavy Duty Truck Manufacturing	336120	1,500	-\$1,022	0.00%	*	*	*	0.00%	0.00%	*
Industrial	Motor Vehicle Body Manufacturing	336211	1,000	-\$1,022	-0.01%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Truck Trailer Manufacturing	336212	1,000	-\$1,022	0.00%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Motor Vehicle Gasoline Engine and Engine Parts Manufacturing	336310	1,000	-\$1,022	0.00%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Carburetor, Piston, Piston Ring, and Valve Manufacturing^	336311	500 (2007 Size Standards)	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Gasoline Engine and Engine Parts Manufacturing^	336312	750 (2007 Size Standards)	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing	336330	1,000	-\$1,022	0.00%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Motor Vehicle Brake System Manufacturing	336340	1,250	-\$1,022	0.00%	*	0.00%	0.00%	0.00%	*	*
Industrial	Motor Vehicle Transmission and Power Train Parts Manufacturing	336350	1,500	-\$1,022	0.00%	*	0.00%	0.00%	0.00%	0.00%	*
Industrial	Motor Vehicle Seating and Interior Trim Manufacturing	336360	1,500	-\$1,022	0.00%	*	0.00%	0.00%	0.00%	*	*
Industrial	Motor Vehicle Metal Stamping	336370	1,000	-\$1,022	0.00%	-0.05%	-0.01%	0.00%	0.00%	0.00%	*
Industrial	Other Motor Vehicle Parts Manufacturing	336390	1,000	-\$1,022	0.00%	-0.04%	0.00%	0.00%	0.00%	0.00%	*
Industrial	All Other Motor Vehicle Parts Manufacturing^	336399	750 (2007 Size Standards)	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Aircraft Manufacturing	336411	1,500	-\$1,022	0.00%	*	-0.01%	0.00%	0.00%	0.00%	0.00%
Industrial	Aircraft Engine and Engine Parts Manufacturing	336412	1,500	-\$1,022	0.00%	-0.05%	-0.01%	0.00%	0.00%	0.00%	0.00%
Industrial	Other Aircraft Parts and Auxiliary Equipment Manufacturing	336413	1,250	-\$1,022	0.00%	*	-0.01%	0.00%	0.00%	*	0.00%
Industrial	Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing	336415	1,250	-\$1,022	0.00%	*	*	*	*	0.00%	*
Industrial	Railroad Rolling Stock Manufacturing	336510	1,500	-\$1,022	0.00%	*	0.00%	0.00%	0.00%	*	*
Industrial	Ship Building and Repairing	336611	1,250	-\$1,022	0.00%	-0.07%	-0.01%	0.00%	0.00%	0.00%	0.00%

(continued)

Table 6-4. Avoided Cost to Sales in Year 1 under the PRIMARY SCENARIO (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Boat Building	336612	1,000	-\$1,022	-0.01%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Military Armored Vehicle, Tank, and Tank Component Manufacturing	336992	1,500	-\$1,022	0.00%	*	*	0.00%	*	*	*
Industrial	Wood Kitchen Cabinet and Countertop Manufacturing	337110	750	-\$1,022	-0.06%	*	*	0.00%	0.00%	*	*
Industrial	Upholstered Household Furniture Manufacturing	337121	1,000	-\$1,022	-0.01%	*	*	0.00%	0.00%	*	*
Industrial	Nonupholstered Wood Household Furniture Manufacturing	337122	750	-\$1,022	-0.06%	*	-0.02%	0.00%	*	*	*
Industrial	Institutional Furniture Manufacturing	337127	500	-\$1,022	-0.01%	*	-0.01%	0.00%	*	*	*
Industrial	Wood Office Furniture Manufacturing	337211	1,000	-\$1,022	-0.01%	*	-0.01%	0.00%	*	*	*
Industrial	Office Furniture (except Wood) Manufacturing	337214	1,000	-\$1,022	0.00%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Showcase, Partition, Shelving, and Locker Manufacturing	337215	500	-\$1,022	-0.02%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Blind and Shade Manufacturing	337920	1,000	-\$1,022	-0.02%	*	-0.01%	0.00%	*	*	*
Industrial	Surgical and Medical Instrument Manufacturing	339112	1,000		**	*, **	*, **	**	**	**	*, **
Industrial	Surgical Appliance and Supplies Manufacturing	339113	750		**	*, **	*, **	**	**	**	*, **
Industrial	Jewelry and Silverware Manufacturing	339910	500		**	**	**	*, **	*, **	*, **	*, **
Industrial	Sporting and Athletic Goods Manufacturing	339920	750		**	**	**	**	**	**	*, **
Industrial	Office Supplies (except Paper) Manufacturing	339940	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Gasket, Packing, and Sealing Device Manufacturing	339991	500		**	*, **	**	**	**	*, **	*, **
Industrial	Burial Casket Manufacturing	339995	1,000	-\$1,022	-0.01%	*	*	*	*	*	*
Industrial	All Other Miscellaneous Manufacturing	339999	500	-\$1,022	-0.05%	-0.19%	-0.01%	0.00%	*	*	*
Commercial	Grain and Field Bean Merchant Wholesalers	424510	200		**	**	**	*, **	*, **	*, **	*, **
Commercial	Petroleum Bulk Stations and Terminals	424710	200	-\$1,022	0.00%	0.00%	0.00%	*	*	*	*
Commercial	Scheduled Passenger Air Transportation	481111	1,500		**	**	**	*, **	*, **	*, **	*, **
Commercial	Line-Haul Railroads	482111	1,500		*, **	*, **	*, **	*, **	*, **	*, **	*, **
Energy	Pipeline Transportation of Crude Oil	486110	1,500		**	**	**	*, **	*, **	*, **	*, **
Energy	Pipeline Transportation of Natural Gas	486210	\$27.5 million	-\$1,022	-0.01%	-0.02%	0.00%	*	*	*	*
Energy	Pipeline Transportation of Refined Petroleum Products	486910	1,500		**	**	*, **	*, **	*, **	*, **	*, **

(continued)

Table 6-4. Avoided Cost to Sales in Year 1 under the PRIMARY SCENARIO (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Commercial	Support Activities for Rail Transportation	488210	\$15 million	-\$1,022	-0.03%	-0.09%	-0.01%	*	*	*	*
Commercial	Marine Cargo Handling	488320	\$38.5 million		**	**	**	*,**	*,**	*,**	*,**
Commercial	General Warehousing and Storage	493110	\$27.5 million	-\$1,022	-0.06%	-0.11%	-0.03%	*	*	*	*
Commercial	Other Warehousing and Storage	493190	\$27.5 million	-\$1,022	-0.04%	-0.14%	-0.03%	*	*	*	*
Commercial	Lessors of Nonresidential Buildings (except Miniwarehouses)	531120	\$27.5 million		**	**	**	*,**	*,**	*,**	*,**
Commercial	Testing Laboratories	541380	\$15 million		**	**	**	*,**	*,**	*,**	*,**
Commercial	Research and Development in the Physical, Engineering and Life Sciences (except Nanotechnology and Biotechnology)^^^	541715	1,000		*,**	*,**	*,**	*,**	*,**	*,**	*,**
Commercial	All Other Support Services	561990	\$11 million		**	**	**	*,**	*,**	*,**	*,**
Waste Treatment	Hazardous Waste Treatment and Disposal	562211	\$38.5 million	-\$1,022	-0.01%	-0.06%	-0.01%	*	*	*	*
Waste Treatment	Solid Waste Landfill	562212	\$38.5 million	-\$1,022	-0.02%	-0.05%	-0.01%	*	*	*	*
Waste Treatment	Solid Waste Combustors and Incinerators	562213	\$38.5 million	-\$1,022	0.00%	*	0.00%	*	*	*	*
Waste Treatment	Remediation Services	562910	\$20.5 million	-\$1,022	-0.03%	-0.09%	-0.01%	*	*	*	*
Educational Services	Colleges, Universities, and Professional Schools	611310	\$27.5 million	-\$1,022	*	*	*	*	*	*	*
Commercial	Amusement and Theme Parks	713110	\$38.5 million		**	**	**	*,**	*,**	*,**	*,**
Commercial	Linen and Uniform Supply	812330	#N/A		*,**	*,**	*,**	*,**	*,**	*,**	*,**
Commercial	Industrial Launderers	812332	\$38.5 million	-\$1,022	-0.02%	-0.07%	-0.02%	*	*	*	*

Notes:

Blanks in “Average Avoided Cost/Entity” column are for NAICS where zero facilities are estimated to obtain area source status. NA means it is not a valid 2012 NAICS code, thus SBA Size Standards are not available.

*No receipts data available from Census; cost-to-sales ratios cannot be calculated.

**Zero facilities estimated to obtain area source status and no estimated net costs (savings); cost-to-sales ratios cannot be calculated.

Sources: 2012 Economic Census, 2012 County Business Patterns, 2017 SBA Size Standards, Federal Reserve Bank of St. Louis Economic Research, Eastern Research Group. August 2020a. ERG MM2A Database Memorandum, Analytical Evaluations & Summary of Industries Potentially Impacted by the Final Rule “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD; Eastern Research Group. August 2020b. ERG MM2A Cost Analysis Memorandum, Compliance cost savings analysis for the final rulemaking “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD. August 2020.7-18, SBA February 2016 Size Standards, SBA 2007 Size Standards.

Table 6-5. Avoided Cost to Sales in Year 5 under the PRIMARY SCENARIO

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Agriculture	Postharvest Crop Activities (except Cotton Ginning)	115114	\$27.5 million		*, **	*, **	*, **	*, **	*, **	*, **	*, **
Energy	Crude Petroleum and Natural Gas Extraction	211111	1250 (Feb 2016 Size Standards)	10,296	0.02%	*	0.01%	0.00%	0.00%	0.00%	*
Energy	Natural Gas Liquid Extraction	211112	750 (Feb 2016 Size Standards)	37,382	0.03%	0.06%	0.02%	0.01%	0.00%	*	*
Industrial	Iron Ore Mining	212210	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Lead Ore and Zinc Ore Mining	212231	750 (Feb 2016 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Copper Ore and Nickel Ore Mining	212234	1500 (Feb 2016 Size Standards)		**	*, **	*, **	*, **	**	*, **	*, **
Industrial	All Other Metal Ore Mining	212299	750		**	*, **	*, **	**	*, **	*, **	*, **
Industrial	Industrial Sand Mining	212322	500		**	**	**	**	*, **	*, **	*, **
Industrial	Kaolin and Ball Clay Mining	212324	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Potash, Soda, and Borate Mineral Mining	212391	750		**	*, **	*, **	*, **	**	*, **	*, **
Industrial	All Other Nonmetallic Mineral Mining	212399	500		**	*, **	**	*, **	*, **	*, **	*, **
Energy	Support Activities for Oil and Gas Operations	213112	\$38.5 million	15,247	0.16%	0.69%	0.16%	0.03%	0.01%	0.00%	*
Utilities	Hydroelectric Power Generation	221111	500	15,247	0.23%	*	*	*	*	*	*
Utilities	Fossil Fuel Electric Power Generation	221112	750	40,186	0.06%	*	*	*	*	*	*
Utilities	Biomass Electric Power Generation	221117	250	63,290	0.87%	*	*	*	*	*	*
Utilities	Other Electric Power Generation	221118	250	15,247	0.59%	*	*	*	*	*	*
Utilities	Other Electric Power Generation^	221119	4 million MWH (2007 Size Standards)	50,126	0.46%	*	*	*	*	*	*
Utilities	Electric Power Distribution	221122	1,000	15,247	0.03%	*	*	*	*	*	*
Utilities	Natural Gas Distribution	221210	1,000	40,400	0.10%	*	*	*	*	*	*
Utilities	Water Supply and Irrigation Systems	221310	\$27.5 million	23,798	0.94%	*	*	*	*	*	*
Utilities	Sewage Treatment Facilities	221320	\$20.5 million	22,367	1.07%	*	*	*	*	*	*
Utilities	Steam and Air-Conditioning Supply	221330	\$15 million	32,701	0.20%	*	*	*	*	*	*
Industrial	Other Animal Food Manufacturing	311119	500		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Wet Corn Milling	311221	1,250		**	*, **	**	**	*, **	*, **	*, **
Industrial	Soybean Processing^	311222	500 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Other Oilseed Processing^	311223	1000 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **

(continued)

Table 6-5. Avoided Cost to Sales in Year 5 under the PRIMARY SCENARIO (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20-99	100~499	500~999	1000~2499	≥2500
Industrial	Soybean and Other Oilseed Processing	311224	1,000	35,287	0.01%	*	0.01%	*	*	*	*
Industrial	Fats and Oils Refining and Blending	311225	1,000		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Beet Sugar Manufacturing	311313	750		**	*, **	*, **	*, **	**	*, **	*, **
Industrial	Cane Sugar Manufacturing	311314	1,000		**	*, **	*, **	**	*, **	*, **	*, **
Industrial	Frozen Fruit, Juice, and Vegetable Manufacturing	311411	1,000		**	*, **	*, **	**	*, **	*, **	*, **
Industrial	Fruit and Vegetable Canning	311421	1,000		**	*, **	**	**	*, **	*, **	*, **
Industrial	Specialty Canning	311422	1,250		**	*, **	*, **	*, **	**	*, **	*, **
Industrial	Cheese Manufacturing	311513	1,250		**	**	**	**	**	**	*, **
Industrial	Dry, Condensed, and Evaporated Dairy Product Manufacturing	311514	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Rendering and Meat Byproduct Processing	311613	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Commercial Bakeries	311812	1,000		**	*, **	**	**	**	*, **	*, **
Industrial	Other Snack Food Manufacturing	311919	1,250		**	*, **	**	**	*, **	*, **	*, **
Industrial	Coffee and Tea Manufacturing	311920	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Flavoring Syrup and Concentrate Manufacturing	311930	1,000		**	*, **	*, **	**	*, **	*, **	*, **
Industrial	Spice and Extract Manufacturing	311942	500		**	*, **	**	**	*, **	*, **	*, **
Industrial	All Other Miscellaneous Food Manufacturing	311999	500		**	*, **	**	**	**	*, **	*, **
Industrial	Breweries	312120	1,250	15,247	0.04%	*	0.10%	*	*	*	*
Industrial	Distilleries	312140	1,000		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Tobacco Manufacturing	312230	1,500		**	*, **	*, **	**	**	*, **	*, **
Industrial	Yarn Spinning Mills^	313111	500 (2007 Size Standards)	15,247	0.06%	*	*	*	*	*	*
Industrial	Thread Mills^	313113	500 (2007 Size Standards)	15,247	0.23%	*	*	*	*	*	*
Industrial	Broadwoven Fabric Mills	313210	1,000	23,798	0.17%	*	0.19%	0.04%	0.02%	*	*
Industrial	Narrow Fabric Mills^	313221	500 (2007 Size Standards)	15,247	0.22%	*	*	*	*	*	*
Industrial	Textile and Fabric Finishing Mills	313310	1,000	15,247	0.24%	*	0.12%	0.03%	*	*	*
Industrial	Broadwoven Fabric Finishing Mills^	313311	1000 (2007 Size Standards)	23,798	0.33%	*	*	*	*	*	*
Industrial	Fabric Coating Mills	313320	1,000	20,093	0.15%	*	0.11%	*	*	*	*
Industrial	Tire Cord and Tire Fabric Mills^	314992	1000 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Leather and Hide Tanning and Finishing	316110	500	13,119	0.16%	*	0.04%	0.02%	*	*	*
Industrial	Sawmills	321113	500	37,382	0.54%	2.66%	0.28%	0.07%	*	*	*

(continued)

Table 6-5. Avoided Cost to Sales in Year 5 under the PRIMARY SCENARIO (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Wood Preservation	321114	500		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Hardwood Veneer and Plywood Manufacturing	321211	500		**	*, **	*, **	**	*, **	*, **	*, **
Industrial	Softwood Veneer and Plywood Manufacturing	321212	1,250	50,126	0.11%	*	*	0.06%	0.03%	*	*
Industrial	Engineered Wood Member (except Truss) Manufacturing	321213	750	15,247	0.17%	*	*	0.02%	*	*	*
Industrial	Reconstituted Wood Product Manufacturing	321219	750	23,687	0.08%	*	*	0.03%	*	*	*
Industrial	Wood Window and Door Manufacturing	321911	1,000		**	*, **	*, **	**	*, **	*, **	*, **
Industrial	Cut Stock, Resawing Lumber, and Planing	321912	500		**	**	**	*, **	*, **	*, **	*, **
Industrial	All Other Miscellaneous Wood Product Manufacturing	321999	500		**	**	**	**	*, **	*, **	*, **
Industrial	Pulp Mills	322110	750	20,948	0.01%	*	*	0.01%	0.00%	*	*
Industrial	Paper (except Newsprint) Mills	322121	1,250	12,461	0.00%	*	*	0.01%	0.00%	0.00%	*
Industrial	Newsprint Mills	322122	750	15,247	0.01%	*	*	*	*	*	*
Industrial	Paperboard Mills	322130	1,250	45,144	0.02%	*	*	0.02%	0.01%	*	*
Industrial	Corrugated and Solid Fiber Box Manufacturing	322211	1,250	958	0.00%	0.03%	0.00%	0.00%	*	*	*
Industrial	Paper Bag and Coated and Treated Paper Manufacturing	322220	750	20,948	0.07%	*	0.10%	0.03%	0.00%	*	*
Industrial	Coated and Laminated Paper Manufacturing^	322222	500 (2007 Size Standards)	23,798	0.08%	*	*	*	*	*	*
Industrial	Sanitary Paper Product Manufacturing	322291	1,500		**	*, **	*, **	**	**	*, **	*, **
Industrial	All Other Converted Paper Product Manufacturing	322299	500		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Commercial Lithographic Printing^	323110	500 (2007 Size Standards)	15,247	0.37%	*	*	*	*	*	*
Industrial	Commercial Printing (except Screen and Books)	323111	500	19,961	0.57%	*	0.23%	0.04%	0.01%	*	*
Industrial	Books Printing	323117	1,250	23,798	0.25%	*	*	0.05%	0.02%	*	*
Industrial	Petroleum Refineries	324110	1,500	98,124	0.00%	*	0.04%	0.00%	*	0.00%	*
Industrial	Asphalt Shingle and Coating Materials Manufacturing	324122	750		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	All Other Petroleum and Coal Products Manufacturing	324199	500		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Petrochemical Manufacturing	325110	1,000	16,608	0.00%	*	*	0.00%	*	*	*
Industrial	Industrial Gas Manufacturing	325120	1,000	15,247	0.09%	0.22%	0.06%	*	*	*	*

(continued)

Table 6-5. Avoided Cost to Sales in Year 5 under the PRIMARY SCENARIO (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Synthetic Dye and Pigment Manufacturing	325130	1,000		**	*,**	**	**	*,**	*,**	*,**
Industrial	Inorganic Dye and Pigment Manufacturing^	325131	1000 (2007 Size Standards)	15,247	0.02%	*	*	*	*	*	*
Industrial	Synthetic Organic Dye and Pigment Manufacturing^	325132	750 (2007 Size Standards)		**	*,**	*,**	*,**	*,**	*,**	*,**
Industrial	Other Basic Inorganic Chemical Manufacturing	325180	1,000	20,948	0.04%	*	0.04%	0.01%	0.00%	*	*
Industrial	Alkalies and Chlorine Manufacturing^	325181	1000 (2007 Size Standards)	24,362	0.01%	*	*	*	*	*	*
Industrial	Carbon Black Manufacturing^	325182	500 (2007 Size Standards)	27,635	0.03%	*	*	*	*	*	*
Industrial	All Other Basic Inorganic Chemical Manufacturing^	325188	1000 (2007 Size Standards)	28,288	0.06%	*	*	*	*	*	*
Industrial	Cyclic Crude and Intermediate Manufacturing^	325192	750 (2007 Size Standards)		**	*,**	*,**	*,**	*,**	*,**	*,**
Industrial	Ethyl Alcohol Manufacturing	325193	1,000	23,798	0.01%	*	0.01%	0.00%	*	*	*
Industrial	Cyclic Crude, Intermediate, and Gum and Wood Chemical Manufacturing	325194	1,250		**	*,**	**	**	*,**	*,**	*,**
Industrial	All Other Basic Organic Chemical Manufacturing	325199	1,250	55,008	0.05%	*	0.09%	0.02%	0.00%	0.00%	*
Industrial	Plastics Material and Resin Manufacturing	325211	1,250	31,275	0.04%	*	0.07%	0.01%	0.00%	0.00%	*
Industrial	Synthetic Rubber Manufacturing	325212	1,000	6,981	0.01%	*	0.01%	*	*	*	*
Industrial	Artificial and Synthetic Fibers and Filaments Manufacturing	325220	1,000	23,798	0.03%	*	0.10%	0.02%	0.00%	*	*
Industrial	Cellulosic Organic Fiber Manufacturing^	325221	1000 (2007 Size Standards)		**	*,**	*,**	*,**	*,**	*,**	*,**
Industrial	Noncellulosic Organic Fiber Manufacturing^	325222	1000 (2007 Size Standards)	20,275	0.03%	*	*	*	*	*	*
Industrial	Nitrogenous Fertilizer Manufacturing	325311	1,000	50,126	0.09%	*	0.09%	*	*	*	*
Industrial	Phosphatic Fertilizer Manufacturing	325312	750	23,798	0.01%	*	*	*	*	*	*
Industrial	Pesticide and Other Agricultural Chemical Manufacturing	325320	1,000	59,967	0.08%	*	0.10%	0.02%	*	*	*
Industrial	Medicinal and Botanical Manufacturing	325411	1,000	15,247	0.05%	*	0.08%	0.02%	0.00%	*	*
Industrial	Pharmaceutical Preparation Manufacturing	325412	1,250	7,362	0.01%	*	*	0.00%	0.00%	0.00%	*
Industrial	Biological Product (except Diagnostic) Manufacturing	325414	1,250		**	*,**	*,**	**	**	**	*,**

(continued)

Table 6-5. Avoided Cost to Sales in Year 5 under the PRIMARY SCENARIO (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	All Other Rubber Product Manufacturing	326299	500	22,088	0.13%	1.07%	0.15%	0.03%	*	*	*
Industrial	Pottery, Ceramics, and Plumbing Fixture Manufacturing	327110	1,000	20,052	0.58%	*	0.28%	0.05%	*	*	*
Industrial	Clay Building Material and Refractories Manufacturing	327120	750	14,991	0.16%	0.89%	0.14%	0.03%	*	*	*
Industrial	Clay Refractory Manufacturing^	327124	500 (2007 Size Standards)	17,824	0.18%	*	*	*	*	*	*
Industrial	Flat Glass Manufacturing	327211	1,000		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Other Pressed and Blown Glass and Glassware Manufacturing	327212	1,250	15,752	0.18%	*	*	*	0.01%	*	*
Industrial	Cement Manufacturing	327310	1,000	23,798	0.09%	*	*	*	*	*	*
Industrial	Lime Manufacturing	327410	750	15,247	0.06%	*	*	*	*	*	*
Industrial	Gypsum Product Manufacturing	327420	1,500		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Paint and Coating Manufacturing	325510	1,000	129,130	0.58%	*	0.41%	0.09%	*	*	*
Industrial	Adhesive Manufacturing	325520	500	15,247	0.06%	0.35%	0.05%	0.01%	*	*	*
Industrial	Surface Active Agent Manufacturing	325613	750		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Toilet Preparation Manufacturing	325620	1,250		**	**	**	**	**	**	*, **
Industrial	Explosives Manufacturing	325920	750		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Custom Compounding of Purchased Resins	325991	500	23,798	0.10%	*	0.08%	0.02%	*	*	*
Industrial	Photographic Film, Paper, Plate, and Chemical Manufacturing	325992	1,500	15,247	0.05%	*	0.07%	0.01%	*	*	*
Industrial	All Other Miscellaneous Chemical Product and Preparation Manufacturing	325998	500	20,948	0.11%	0.64%	0.07%	0.02%	0.01%	*	*
Industrial	Plastics Packaging Film and Sheet (including Laminated) Manufacturing	326112	1,000	23,798	0.07%	0.73%	0.11%	0.03%	*	*	*
Industrial	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing	326113	750	45,144	0.14%	*	0.20%	0.05%	0.01%	*	*
Industrial	Unlaminated Plastics Profile Shape Manufacturing	326121	500		**	*, **	**	**	*, **	*, **	*, **
Industrial	Plastics Pipe and Pipe Fitting Manufacturing	326122	750		**	**	**	**	*, **	*, **	*, **
Industrial	Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing	326130	500	20,948	0.13%	*	0.13%	*	*	*	*
Industrial	Polystyrene Foam Product Manufacturing	326140	1,000		**	*, **	**	**	**	*, **	*, **

(continued)

Table 6-5. Avoided Cost to Sales in Year 5 under the PRIMARY SCENARIO (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Urethane and Other Foam Product (except Polystyrene) Manufacturing	326150	750	12,483	0.08%	*	0.07%	0.03%	*	*	*
Industrial	Plastics Plumbing Fixture Manufacturing	326191	750		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	All Other Plastics Product Manufacturing	326199	750	41,479	0.31%	2.66%	0.35%	0.08%	0.02%	0.01%	*
Industrial	Tire Manufacturing (except Retreading)	326211	1,500	37,602	0.02%	*	*	0.02%	0.01%	0.01%	*
Industrial	Rubber and Plastics Hoses and Belting Manufacturing	326220	750	23,798	0.11%	*	*	0.03%	0.02%	*	*
Industrial	Rubber Product Manufacturing for Mechanical Use	326291	750		**	*, **	*, **	**	**	*, **	*, **
Industrial	Abrasive Product Manufacturing	327910	750	15,247	0.08%	0.65%	0.09%	0.01%	0.00%	*	*
Industrial	Mineral Wool Manufacturing	327993	1,500	29,431	0.15%	*	0.21%	0.03%	*	*	*
Industrial	All Other Miscellaneous Nonmetallic Mineral Product Manufacturing	327999	500		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Iron and Steel Mills and Ferroalloy Manufacturing	331110	1,500	34,996	0.01%	*	*	0.01%	0.00%	0.00%	*
Industrial	Iron and Steel Mills^	331111	1000 (2007 Size Standards)	20,948	0.01%	*	*	*	*	*	*
Industrial	Electrometallurgical Ferroalloy Product Manufacturing^	331112	750 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel	331210	1,000	23,798	0.03%	0.46%	0.08%	0.02%	0.01%	0.00%	*
Industrial	Rolled Steel Shape Manufacturing	331221	1,000	23,798	0.07%	*	0.06%	*	*	*	*
Industrial	Primary Aluminum Production^	331312	1000 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Alumina Refining and Primary Aluminum Production	331313	1,000	261,229	0.17%	*	0.56%	0.11%	0.05%	*	*
Industrial	Secondary Smelting and Alloying of Aluminum	331314	750	4,738	0.01%	*	0.01%	*	*	*	*
Industrial	Aluminum Sheet, Plate, and Foil Manufacturing	331315	1,250	23,798	0.01%	*	*	0.01%	0.00%	*	*
Industrial	Aluminum Extruded Product Manufacturing^	331316	750 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Other Aluminum Rolling, Drawing, and Extruding	331318	750		**	*, **	*, **	**	*, **	*, **	*, **
Industrial	Nonferrous Metal (except Aluminum) Smelting and Refining	331410	1,000		**	*, **	**	*, **	**	*, **	*, **

(continued)

Table 6-5. Avoided Cost to Sales in Year 5 under the PRIMARY SCENARIO (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Primary Smelting and Refining of Copper^	331411	1000 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Primary Smelting and Refining of Nonferrous Metal (except Copper and Aluminum)^	331419	750 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Copper Rolling, Drawing, Extruding, and Alloying	331420	1,000		**	*, **	**	**	**	*, **	*, **
Industrial	Copper Wire (except Mechanical) Drawing^	331422	1000 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, and Extruding	331491	750	15,247	0.06%	*	0.07%	0.02%	*	*	*
Industrial	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	331492	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Iron Foundries	331511	1,000	63,290	0.22%	*	*	0.10%	0.02%	*	*
Industrial	Steel Foundries (except Investment)	331513	500		**	*, **	**	**	**	*, **	*, **
Industrial	Aluminum Die-Casting Foundries^	331521	500 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Aluminum Foundries (except Die-Casting)	331524	500		**	*, **	**	**	*, **	*, **	*, **
Industrial	Nonferrous Forging	332112	750	15,247	0.03%	*	*	0.02%	0.00%	*	*
Industrial	Metal Crown, Closure, and Other Metal Stamping (except Automotive)	332119	500	15,247	0.18%	1.08%	0.15%	0.03%	0.01%	*	*
Industrial	Hand and Edge Tool Manufacturing^	332212	500 (2007 Size Standards)	15,247	0.25%	*	*	*	*	*	*
Industrial	Prefabricated Metal Building and Component Manufacturing	332311	750	15,247	0.15%	*	0.10%	0.03%	*	*	*
Industrial	Fabricated Structural Metal Manufacturing	332312	500	15,247	0.16%	*	0.11%	0.02%	*	*	*
Industrial	Metal Window and Door Manufacturing	332321	750	63,290	0.64%	*	0.61%	0.13%	0.04%	*	*
Industrial	Sheet Metal Work Manufacturing	332322	500	15,247	0.29%	1.11%	0.17%	0.04%	*	*	*
Industrial	Metal Can Manufacturing	332431	1,500	46,894	0.05%	*	0.08%	0.03%	*	*	*
Industrial	Other Metal Container Manufacturing	332439	500	23,798	0.21%	1.69%	0.15%	0.05%	0.01%	*	*
Industrial	Bolt, Nut, Screw, Rivet, and Washer Manufacturing	332722	500	15,247	0.12%	1.00%	0.12%	0.03%	0.01%	*	*
Industrial	Metal Heat Treating	332811	750	15,247	0.17%	*	0.17%	*	*	*	*

(continued)

Table 6-5. Avoided Cost to Sales in Year 5 under the PRIMARY SCENARIO (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers	332812	500	47,888	0.86%	5.68%	0.46%	0.06%	*	*	*
Industrial	Electroplating, Plating, Polishing, Anodizing, and Coloring	332813	500	23,798	0.74%	2.90%	0.39%	*	*	*	*
Industrial	Other Fabricated Metal Manufacturing	332990	#N/A	15,247	*	*	*	*	*	*	*
Industrial	Small Arms Ammunition Manufacturing	332992	1,250	15,247	0.04%	*	*	*	*	*	*
Industrial	Ammunition (except Small Arms) Manufacturing	332993	1,500	23,798	0.03%	*	*	*	*	*	*
Industrial	All Other Miscellaneous Fabricated Metal Product Manufacturing	332999	750	23,798	0.57%	2.65%	0.29%	0.05%	0.01%	*	*
Industrial	Farm Machinery and Equipment Manufacturing	333111	1,250	20,948	0.06%	*	0.16%	0.02%	0.00%	0.00%	*
Industrial	Lawn and Garden Tractor and Home Lawn and Garden Equipment Manufacturing	333112	1,500		**	*, **	*, **	**	**	*, **	*, **
Industrial	Construction Machinery Manufacturing	333120	1,250	12,504	0.02%	*	0.08%	0.01%	0.00%	0.00%	*
Industrial	Mining Machinery and Equipment Manufacturing	333131	500		**	*, **	**	**	*, **	*, **	*, **
Industrial	Printing Machinery and Equipment Manufacturing^	333293	500 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Photographic and Photocopying Equipment Manufacturing	333316	1,000		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing	333415	1,250		**	**	**	**	**	**	*, **
Industrial	Machine Tool (Metal Cutting Types) Manufacturing^	333512	500 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Machine Tool (Metal Forming Types) Manufacturing^	333513	500 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Turbine and Turbine Generator Set Units Manufacturing	333611	1,500		**	*, **	*, **	**	**	**	*, **
Industrial	Other Engine Equipment Manufacturing	333618	1,500	23,798	0.03%	0.94%	0.11%	0.02%	0.00%	0.00%	*

(continued)

Table 6-5. Avoided Cost to Sales in Year 5 under the PRIMARY SCENARIO (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Overhead Traveling Crane, Hoist, and Monorail System Manufacturing	333923	1,250		**	*, **	**	**	*, **	*, **	*, **
Industrial	Welding and Soldering Equipment Manufacturing	333992	1,250		**	**	**	**	*, **	**	*, **
Industrial	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	334220	1,250		**	**	**	**	**	**	**
Industrial	Electron Tube Manufacturing^	334411	750 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Bare Printed Circuit Board Manufacturing	334412	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Semiconductor and Related Device Manufacturing	334413	1,250	41,053	0.07%	*	0.13%	0.05%	0.01%	0.00%	*
Industrial	Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use	334512	500		**	*, **	**	*, **	**	*, **	*, **
Industrial	Blank Magnetic and Optical Recording Media Manufacturing	334613	1,000		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Electric Lamp Bulb and Part Manufacturing	335110	1,250	15,247	0.05%	*	*	0.03%	*	*	*
Industrial	Household Laundry Equipment Manufacturing	335224	1,250	36,901	*	*	*	*	*	*	*
Industrial	Other Major Household Appliance Manufacturing	335228	1,000	23,798	0.01%	*	*	*	0.01%	*	*
Industrial	Power, Distribution, and Specialty Transformer Manufacturing	335311	750	15,247	0.06%	*	0.11%	0.02%	0.01%	*	*
Industrial	Motor and Generator Manufacturing	335312	1,250	23,798	0.09%	*	0.20%	0.03%	*	*	*
Industrial	Storage Battery Manufacturing	335911	1,250	15,247	0.03%	*	*	0.02%	0.01%	*	*
Industrial	Current-Carrying Wiring Device Manufacturing	335931	500	15,247	0.09%	*	0.13%	0.03%	0.01%	*	*
Industrial	Noncurrent-Carrying Wiring Device Manufacturing	335932	1,000	15,247	0.04%	*	0.07%	0.02%	*	*	*
Industrial	Carbon and Graphite Product Manufacturing	335991	750	63,290	0.26%	*	0.38%	0.08%	*	*	*
Industrial	Automobile Manufacturing	336111	1,500	46,223	0.01%	*	*	*	*	0.00%	0.00%
Industrial	Light Truck and Utility Vehicle Manufacturing	336112	1,500	63,290	0.00%	*	*	0.11%	*	*	0.00%
Industrial	Heavy Duty Truck Manufacturing	336120	1,500	57,102	0.02%	*	*	*	0.01%	0.00%	*
Industrial	Motor Vehicle Body Manufacturing	336211	1,000	57,102	0.35%	*	0.50%	0.10%	0.02%	*	*

(continued)

Table 6-5. Avoided Cost to Sales in Year 5 under the PRIMARY SCENARIO (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Truck Trailer Manufacturing	336212	1,000	15,247	0.07%	*	0.14%	0.02%	0.01%	*	*
Industrial	Motor Vehicle Gasoline Engine and Engine Parts Manufacturing	336310	1,000	23,798	0.06%	*	0.17%	0.02%	0.00%	*	*
Industrial	Carburetor, Piston, Piston Ring, and Valve Manufacturing^	336311	500 (2007 Size Standards)	15,247	0.06%	*	*	*	*	*	*
Industrial	Gasoline Engine and Engine Parts Manufacturing^	336312	750 (2007 Size Standards)	23,798	0.06%	*	*	*	*	*	*
Industrial	Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing	336330	1,000	23,798	0.05%	*	0.13%	0.02%	0.01%	*	*
Industrial	Motor Vehicle Brake System Manufacturing	336340	1,250	15,247	0.03%	*	0.06%	0.01%	0.01%	*	*
Industrial	Motor Vehicle Transmission and Power Train Parts Manufacturing	336350	1,500	23,798	0.03%	*	0.09%	0.02%	0.01%	0.00%	*
Industrial	Motor Vehicle Seating and Interior Trim Manufacturing	336360	1,500	15,247	0.03%	*	0.07%	0.01%	0.00%	*	*
Industrial	Motor Vehicle Metal Stamping	336370	1,000	15,247	0.04%	0.70%	0.09%	0.02%	0.01%	0.00%	*
Industrial	Other Motor Vehicle Parts Manufacturing	336390	1,000	45,144	0.11%	1.65%	0.21%	0.04%	0.01%	0.01%	*
Industrial	All Other Motor Vehicle Parts Manufacturing^	336399	750 (2007 Size Standards)	23,798	0.06%	*	*	*	*	*	*
Industrial	Aircraft Manufacturing	336411	1,500	106,215	0.03%	*	1.03%	0.11%	0.03%	0.01%	0.00%
Industrial	Aircraft Engine and Engine Parts Manufacturing	336412	1,500	57,102	0.07%	2.71%	0.42%	0.06%	0.02%	0.01%	0.00%
Industrial	Other Aircraft Parts and Auxiliary Equipment Manufacturing	336413	1,250	50,126	0.12%	*	0.36%	0.07%	0.02%	*	0.00%
Industrial	Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing	336415	1,250	15,247	0.01%	*	*	*	*	0.00%	*
Industrial	Railroad Rolling Stock Manufacturing	336510	1,500	15,247	0.02%	*	0.06%	0.01%	0.00%	*	*
Industrial	Ship Building and Repairing	336611	1,250	53,375	0.14%	3.45%	0.48%	0.09%	0.04%	0.01%	0.00%
Industrial	Boat Building	336612	1,000	15,387	0.18%	*	0.14%	0.02%	0.01%	*	*
Industrial	Military Armored Vehicle, Tank, and Tank Component Manufacturing	336992	1,500	23,798	0.02%	*	*	0.03%	*	*	*
Industrial	Wood Kitchen Cabinet and Countertop Manufacturing	337110	750	8,823	0.52%	*	*	0.02%	0.01%	*	*
Industrial	Upholstered Household Furniture Manufacturing	337121	1,000	23,798	0.26%	*	*	0.07%	0.02%	*	*
Industrial	Nonupholstered Wood Household Furniture Manufacturing	337122	750	40,400	2.21%	*	0.68%	0.14%	*	*	*

(continued)

Table 6-5. Avoided Cost to Sales in Year 5 under the PRIMARY SCENARIO (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Institutional Furniture Manufacturing	337127	500	15,247	0.22%	*	0.20%	0.04%	*	*	*
Industrial	Wood Office Furniture Manufacturing	337211	1,000	63,290	0.86%	*	0.85%	0.13%	*	*	*
Industrial	Office Furniture (except Wood) Manufacturing	337214	1,000	26,368	0.07%	*	0.29%	0.04%	0.01%	*	*
Industrial	Showcase, Partition, Shelving, and Locker Manufacturing	337215	500	15,247	0.23%	*	0.18%	0.04%	0.01%	*	*
Industrial	Blind and Shade Manufacturing	337920	1,000	15,247	0.29%	*	0.18%	0.04%	*	*	*
Industrial	Surgical and Medical Instrument Manufacturing	339112	1,000		**	*, **	*, **	**	**	**	*, **
Industrial	Surgical Appliance and Supplies Manufacturing	339113	750		**	*, **	*, **	**	**	**	*, **
Industrial	Jewelry and Silverware Manufacturing	339910	500		**	**	**	*, **	*, **	*, **	*, **
Industrial	Sporting and Athletic Goods Manufacturing	339920	750		**	**	**	**	**	**	*, **
Industrial	Office Supplies (except Paper) Manufacturing	339940	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Gasket, Packing, and Sealing Device Manufacturing	339991	500		**	*, **	**	**	**	*, **	*, **
Industrial	Burial Casket Manufacturing	339995	1,000	15,247	0.21%	*	*	*	*	*	*
Industrial	All Other Miscellaneous Manufacturing	339999	500	23,798	1.12%	4.47%	0.34%	0.03%	*	*	*
Commercial	Grain and Field Bean Merchant Wholesalers	424510	200		**	**	**	*, **	*, **	*, **	*, **
Commercial	Petroleum Bulk Stations and Terminals	424710	200	20,948	0.01%	0.03%	0.01%	*	*	*	*
Commercial	Scheduled Passenger Air Transportation	481111	1,500		**	**	**	*, **	*, **	*, **	*, **
Commercial	Line-Haul Railroads	482111	1,500		*, **	*, **	*, **	*, **	*, **	*, **	*, **
Energy	Pipeline Transportation of Crude Oil	486110	1,500		**	**	**	*, **	*, **	*, **	*, **
Energy	Pipeline Transportation of Natural Gas	486210	\$27.5 million	29,013	0.25%	0.59%	0.08%	*	*	*	*
Energy	Pipeline Transportation of Refined Petroleum Products	486910	1,500		**	**	*, **	*, **	*, **	*, **	*, **
Commercial	Support Activities for Rail Transportation	488210	\$15 million	15,247	0.37%	1.32%	0.21%	*	*	*	*
Commercial	Marine Cargo Handling	488320	\$38.5 million		**	**	**	*, **	*, **	*, **	*, **
Commercial	General Warehousing and Storage	493110	\$27.5 million	24,809	1.34%	2.75%	0.84%	*	*	*	*
Commercial	Other Warehousing and Storage	493190	\$27.5 million	23,798	0.92%	3.35%	0.66%	*	*	*	*

(continued)

Table 6-5. Avoided Cost to Sales in Year 5 under the PRIMARY SCENARIO (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Commercial	Lessors of Nonresidential Buildings (except Miniwarehouses)	531120	\$27.5 million		**	**	**	*, **	*, **	*, **	*, **
Commercial	Testing Laboratories	541380	\$15 million		**	**	**	*, **	*, **	*, **	*, **
Commercial	Research and Development in the Physical, Engineering and Life Sciences (except Nanotechnology and Biotechnology)^	541715	1,000		*, **	*, **	*, **	*, **	*, **	*, **	*, **
Commercial	All Other Support Services	561990	\$11 million		**	**	**	*, **	*, **	*, **	*, **
Waste Treatment	Hazardous Waste Treatment and Disposal	562211	\$38.5 million	87,950	1.03%	4.95%	0.74%	*	*	*	*
Waste Treatment	Solid Waste Landfill	562212	\$38.5 million	63,290	1.46%	2.83%	0.46%	*	*	*	*
Waste Treatment	Solid Waste Combustors and Incinerators	562213	\$38.5 million	23,798	0.10%	*	0.07%	*	*	*	*
Waste Treatment	Remediation Services	562910	\$20.5 million	15,247	0.41%	1.28%	0.21%	*	*	*	*
Educational Services	Colleges, Universities, and Professional Schools	611310	\$27.5 million	40,400	*	*	*	*	*	*	*
Commercial	Amusement and Theme Parks	713110	\$38.5 million		**	**	**	*, **	*, **	*, **	*, **
Commercial	Linen and Uniform Supply	812330	#N/A		*, **	*, **	*, **	*, **	*, **	*, **	*, **
Commercial	Industrial Launderers	812332	\$38.5 million	15,247	0.26%	0.98%	0.24%	*	*	*	*

Notes:

Blanks in “Average Avoided Cost/Entity” column are for NAICS where zero facilities are estimated to obtain area source status. NA means it is not a valid 2012 NAICS code thus SBA Size Standards are not available.

*No receipts data available from Census; cost-to-sales ratios cannot be calculated.

**Zero facilities estimated to obtain area source status and no estimated net costs (savings); cost-to-sales ratios cannot be calculated.

*,**Denotes the data status as a combination of footnotes * and **.

Sources: 2012 Economic Census, 2012 County Business Patterns, 2017 SBA Size Standards, Federal Reserve Bank of St. Louis Economic Research, Eastern Research Group. August 2020a. ERG MM2A Database Memorandum, Analytical Evaluations & Summary of Industries Potentially Impacted by the Final Rule “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD; Eastern Research Group. August 2020b. ERG MM2A Cost Analysis Memorandum, Compliance cost savings analysis for the final rulemaking “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD. August 2020.7-18, SBA February 2016 Size Standards, SBA 2007 Size Standards.

6.4 Implementing the Sales Test to Measure Impacts on Industrial, Commercial and Other Sources under Alternative Scenario 1

For alternative scenario 1, the year 1 avoided costs-to-sales ratios are reported in Table 6-6, and the year 5 avoided cost-to-sales ratios are reported in Table 6-7. The year 1 avoided cost-to-sales ratios range from -0.19 percent to less than 0.01 percent, with a median avoided cost-to-sales ratio of less than 0.01 percent across all employment size categories. The twenty-fifth percentile and seventy-fifth percentile avoided cost-to-sales ratio in year 1 are -0.01 percent and less than 0.01 percent respectively across all employment size categories. The year 5 avoided cost-to-sales ratios range from less than 0.01 percent to 5.69 percent, with a median avoided cost-to-sales ratio of 0.05 percent across all employment size categories. The twenty-fifth percentile and seventy-fifth percentile avoided cost-to-sales ratios in year 5 are 0.03 percent and 0.23 percent respectively across all employment size categories.

Because facilities according to our analysis do not face permitting costs in year 5 and all reclassifications will have taken place, the cost savings are larger and the resulting avoided cost-to-sales ratios are higher in year 5 than year 1. For example, NAICS 493110 (General Warehousing and Storage) has an overall year 1 avoided cost-to-sales ratio of -0.06 percent and an overall year 5 avoided cost-to-sales ratio of 1.34 percent. All NAICS codes have negative cost-to-sales ratios in year 1 and positive cost-to-sales ratios in year 5.

Like the primary scenario, we conducted a small entity analysis for both year 1 and year 5 impact estimates for the alternative scenario 1. In year 1, some small size categories have small negative avoided cost-to-sales ratios. NAICS 424710 (Petroleum Bulk Stations and Terminals) has an avoided cost-to-sales ratio of less than 0.01 percent for the “fewer than or equal to 19 employees” category and less than 0.01 percent for the “20 to 99 employees” category in year 1. There are no cases of positive economic impacts for year 1, but there are cases of larger positive economic impacts for small size categories in year 5. NAICS 332812 (Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers) has an avoided cost-to-sales ratio of -0.12 percent for the “fewer than or equal to 19 employees” category in year 1, and NAICS 493190 (Other Warehousing and Storage) has a year 5 avoided cost-to-sales ratio of 3.35 percent for the same size category. Establishments in the “fewer than or equal to 19 employees” size category for NAICS 493190 are considered small businesses for purposes of this analysis because the average receipts per establishment is \$0.7 million, which is less than the SBA size standard of \$27.5 million for this NAICS code.

Table 6-6. Avoided Cost to Sales in Year 1 under ALTERNATIVE SCENARIO 1

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20-99	100~499	500~999	1000~2499	≥2500
Agriculture	Postharvest Crop Activities (except Cotton Ginning)	115114	\$27.5 million		*, **	*, **	*, **	*, **	*, **	*, **	*, **
Energy	Crude Petroleum and Natural Gas Extraction	211111	1250 (Feb 2016 Size Standards)	-\$1,022	0.00%	*	0.00%	0.00%	0.00%	0.00%	*
Energy	Natural Gas Liquid Extraction	211112	750 (Feb 2016 Size Standards)	-\$1,022	0.00%	0.00%	0.00%	0.00%	0.00%	*	*
Industrial	Iron Ore Mining	212210	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Lead Ore and Zinc Ore Mining	212231	750 (Feb 2016 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Copper Ore and Nickel Ore Mining	212234	1500 (Feb 2016 Size Standards)		**	*, **	*, **	*, **	**	*, **	*, **
Industrial	All Other Metal Ore Mining	212299	750		**	*, **	*, **	**	*, **	*, **	*, **
Industrial	Industrial Sand Mining	212322	500		**	**	**	**	*, **	*, **	*, **
Industrial	Kaolin and Ball Clay Mining	212324	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Potash, Soda, and Borate Mineral Mining	212391	750		**	*, **	*, **	*, **	**	*, **	*, **
Industrial	All Other Nonmetallic Mineral Mining	212399	500		**	*, **	**	*, **	*, **	*, **	*, **
Energy	Support Activities for Oil and Gas Operations	213112	\$38.5 million	-\$1,022	-0.01%	-0.05%	-0.01%	0.00%	0.00%	0.00%	*
Utilities	Hydroelectric Power Generation	221111	500	-\$1,022	-0.02%	*	*	*	*	*	*
Utilities	Fossil Fuel Electric Power Generation	221112	750	-\$1,022	0.00%	*	*	*	*	*	*
Utilities	Biomass Electric Power Generation	221117	250	-\$1,022	-0.01%	*	*	*	*	*	*
Utilities	Other Electric Power Generation	221118	250	-\$1,022	-0.04%	*	*	*	*	*	*
Utilities	Other Electric Power Generation^	221119	4 million MWH (2007 Size Standards)	-\$1,022	-0.01%	*	*	*	*	*	*
Utilities	Electric Power Distribution	221122	1,000	-\$1,022	0.00%	*	*	*	*	*	*
Utilities	Natural Gas Distribution	221210	1,000	-\$1,022	0.00%	*	*	*	*	*	*
Utilities	Water Supply and Irrigation Systems	221310	\$27.5 million	-\$1,022	-0.04%	*	*	*	*	*	*
Utilities	Sewage Treatment Facilities	221320	\$20.5 million	-\$1,022	-0.05%	*	*	*	*	*	*
Utilities	Steam and Air-Conditioning Supply	221330	\$15 million	-\$1,022	-0.01%	*	*	*	*	*	*
Industrial	Other Animal Food Manufacturing	311119	500		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Wet Corn Milling	311221	1,250		**	*, **	**	**	*, **	*, **	*, **
Industrial	Soybean Processing^	311222	500 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Other Oilseed Processing^	311223	1000 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **

(continued)

Table 6-6. Avoided Cost to Sales in Year 1 under ALTERNATIVE SCENARIO 1 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20-99	100~499	500~999	1000~2499	≥2500
Industrial	Soybean and Other Oilseed Processing	311224	1,000	-\$1,022	0.00%	*	0.00%	*	*	*	*
Industrial	Fats and Oils Refining and Blending	311225	1,000		**	, **	**	, **	, **	, **	, **
Industrial	Beet Sugar Manufacturing	311313	750		**	, **	, **	, **	**	, **	, **
Industrial	Cane Sugar Manufacturing	311314	1,000		**	, **	, **	**	, **	, **	, **
Industrial	Frozen Fruit, Juice, and Vegetable Manufacturing	311411	1,000		**	, **	, **	**	, **	, **	, **
Industrial	Fruit and Vegetable Canning	311421	1,000		**	, **	**	**	, **	, **	, **
Industrial	Specialty Canning	311422	1,250		**	, **	, **	, **	**	, **	, **
Industrial	Cheese Manufacturing	311513	1,250		**	**	**	**	**	**	**
Industrial	Dry, Condensed, and Evaporated Dairy Product Manufacturing	311514	750		**	, **	**	**	, **	, **	, **
Industrial	Rendering and Meat Byproduct Processing	311613	750		**	, **	**	**	, **	, **	, **
Industrial	Commercial Bakeries	311812	1,000		**	, **	**	**	**	, **	, **
Industrial	Other Snack Food Manufacturing	311919	1,250		**	, **	**	**	, **	, **	, **
Industrial	Coffee and Tea Manufacturing	311920	750		**	, **	**	**	, **	, **	, **
Industrial	Flavoring Syrup and Concentrate Manufacturing	311930	1,000		**	, **	, **	**	, **	, **	, **
Industrial	Spice and Extract Manufacturing	311942	500		**	, **	**	**	, **	, **	, **
Industrial	All Other Miscellaneous Food Manufacturing	311999	500		**	, **	**	**	, **	, **	, **
Industrial	Breweries	312120	1,250	-\$1,022	0.00%	*	-0.01%	*	*	*	*
Industrial	Distilleries	312140	1,000		**	, **	, **	, **	, **	, **	, **
Industrial	Tobacco Manufacturing	312230	1,500		**	, **	, **	**	**	, **	, **
Industrial	Yarn Spinning Mills^	313111	500 (2007 Size Standards)	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Thread Mills^	313113	500 (2007 Size Standards)	-\$1,022	-0.02%	*	*	*	*	*	*
Industrial	Broadwoven Fabric Mills	313210	1,000	-\$1,022	-0.01%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Narrow Fabric Mills^	313221	500 (2007 Size Standards)	-\$1,022	-0.01%	*	*	*	*	*	*
Industrial	Textile and Fabric Finishing Mills	313310	1,000	-\$1,022	-0.02%	*	-0.01%	0.00%	*	*	*
Industrial	Broadwoven Fabric Finishing Mills^	313311	1000 (2007 Size Standards)	-\$1,022	-0.01%	*	*	*	*	*	*
Industrial	Fabric Coating Mills	313320	1,000	-\$1,022	-0.01%	*	-0.01%	*	*	*	*
Industrial	Tire Cord and Tire Fabric Mills^	314992	1000 (2007 Size Standards)		**	, **	, **	, **	, **	, **	, **
Industrial	Leather and Hide Tanning and Finishing	316110	500	-\$1,022	-0.01%	*	0.00%	0.00%	*	*	*
Industrial	Sawmills	321113	500	-\$1,022	-0.01%	-0.07%	-0.01%	0.00%	*	*	*
Industrial	Wood Preservation	321114	500		**	, **	**	, **	, **	, **	, **

(continued)

Table 6-6. Avoided Cost to Sales in Year 1 under ALTERNATIVE SCENARIO 1 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Hardwood Veneer and Plywood Manufacturing	321211	500		**	*, **	*, **	**	*, **	*, **	*, **
Industrial	Softwood Veneer and Plywood Manufacturing	321212	1,250	-\$1,022	0.00%	*	*	0.00%	0.00%	*	*
Industrial	Engineered Wood Member (except Truss) Manufacturing	321213	750		**	*, **	*, **	**	*, **	*, **	*, **
Industrial	Reconstituted Wood Product Manufacturing	321219	750	-\$1,022	0.00%	*	*	0.00%	*	*	*
Industrial	Wood Window and Door Manufacturing	321911	1,000		**	*, **	*, **	**	*, **	*, **	*, **
Industrial	Cut Stock, Resawing Lumber, and Planing	321912	500		**	**	**	*, **	*, **	*, **	*, **
Industrial	All Other Miscellaneous Wood Product Manufacturing	321999	500		**	**	**	**	*, **	*, **	*, **
Industrial	Pulp Mills	322110	750	-\$1,022	0.00%	*	*	0.00%	0.00%	*	*
Industrial	Paper (except Newsprint) Mills	322121	1,250	-\$1,022	0.00%	*	*	0.00%	0.00%	0.00%	*
Industrial	Newsprint Mills	322122	750	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Paperboard Mills	322130	1,250	-\$1,022	0.00%	*	*	0.00%	0.00%	*	*
Industrial	Corrugated and Solid Fiber Box Manufacturing	322211	1,250	-\$1,022	0.00%	-0.03%	0.00%	0.00%	*	*	*
Industrial	Paper Bag and Coated and Treated Paper Manufacturing	322220	750	-\$1,022	0.00%	*	0.00%	0.00%	0.00%	*	*
Industrial	Coated and Laminated Paper Manufacturing^	322222	500 (2007 Size Standards)	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Sanitary Paper Product Manufacturing	322291	1,500		**	*, **	*, **	**	**	*, **	*, **
Industrial	All Other Converted Paper Product Manufacturing	322299	500		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Commercial Lithographic Printing^	323110	500 (2007 Size Standards)	-\$1,022	-0.03%	*	*	*	*	*	*
Industrial	Commercial Printing (except Screen and Books)	323111	500	-\$1,022	-0.03%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Books Printing	323117	1,250	-\$1,022	-0.01%	*	*	0.00%	0.00%	*	*
Industrial	Petroleum Refineries	324110	1,500	-\$1,037	0.00%	*	0.00%	0.00%	*	0.00%	*
Industrial	Asphalt Shingle and Coating Materials Manufacturing	324122	750		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	All Other Petroleum and Coal Products Manufacturing	324199	500		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Petrochemical Manufacturing	325110	1,000	-\$1,020	0.00%	*	*	0.00%	*	*	*
Industrial	Industrial Gas Manufacturing	325120	1,000	-\$1,022	-0.01%	-0.01%	0.00%	*	*	*	*
Industrial	Synthetic Dye and Pigment Manufacturing	325130	1,000		**	*, **	**	**	*, **	*, **	*, **

(continued)

Table 6-6. Avoided Cost to Sales in Year 1 under ALTERNATIVE SCENARIO 1 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Inorganic Dye and Pigment Manufacturing^	325131	1000 (2007 Size Standards)	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Synthetic Organic Dye and Pigment Manufacturing^	325132	750 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Other Basic Inorganic Chemical Manufacturing	325180	1,000	-\$1,022	0.00%	*	0.00%	0.00%	0.00%	*	*
Industrial	Alkalies and Chlorine Manufacturing^	325181	1000 (2007 Size Standards)	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Carbon Black Manufacturing^	325182	500 (2007 Size Standards)	-\$1,040	0.00%	*	*	*	*	*	*
Industrial	All Other Basic Inorganic Chemical Manufacturing^	325188	1000 (2007 Size Standards)	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Cyclic Crude and Intermediate Manufacturing^	325192	750 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Ethyl Alcohol Manufacturing	325193	1,000	-\$1,022	0.00%	*	0.00%	0.00%	*	*	*
Industrial	Cyclic Crude, Intermediate, and Gum and Wood Chemical Manufacturing	325194	1,250		**	*, **	**	**	*, **	*, **	*, **
Industrial	All Other Basic Organic Chemical Manufacturing	325199	1,250	-\$1,022	0.00%	*	0.00%	0.00%	0.00%	0.00%	*
Industrial	Plastics Material and Resin Manufacturing	325211	1,250	-\$1,022	0.00%	*	0.00%	0.00%	0.00%	0.00%	*
Industrial	Synthetic Rubber Manufacturing	325212	1,000	-\$1,022	0.00%	*	0.00%	*	*	*	*
Industrial	Artificial and Synthetic Fibers and Filaments Manufacturing	325220	1,000	-\$1,022	0.00%	*	0.00%	0.00%	0.00%	*	*
Industrial	Cellulosic Organic Fiber Manufacturing^	325221	1000 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Noncellulosic Organic Fiber Manufacturing^	325222	1000 (2007 Size Standards)	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Nitrogenous Fertilizer Manufacturing	325311	1,000	-\$1,022	0.00%	*	0.00%	*	*	*	*
Industrial	Phosphatic Fertilizer Manufacturing	325312	750	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Pesticide and Other Agricultural Chemical Manufacturing	325320	1,000	-\$1,022	0.00%	*	0.00%	0.00%	*	*	*
Industrial	Medicinal and Botanical Manufacturing	325411	1,000	-\$1,022	0.00%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Pharmaceutical Preparation Manufacturing	325412	1,250	-\$1,022	0.00%	*	*	0.00%	0.00%	0.00%	*
Industrial	Biological Product (except Diagnostic) Manufacturing	325414	1,250		**	*, **	*, **	**	**	**	*, **
Industrial	Paint and Coating Manufacturing	325510	1,000	-\$1,022	0.00%	*	0.00%	0.00%	*	*	*

(continued)

Table 6-6. Avoided Cost to Sales in Year 1 under ALTERNATIVE SCENARIO 1 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20-99	100~499	500~999	1000~2499	≥2500
Industrial	Adhesive Manufacturing	325520	500	-\$1,022	0.00%	-0.02%	0.00%	0.00%	*	*	*
Industrial	Surface Active Agent Manufacturing	325613	750		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Toilet Preparation Manufacturing	325620	1,250		**	**	**	**	**	**	*, **
Industrial	Explosives Manufacturing	325920	750		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Custom Compounding of Purchased Resins	325991	500	-\$1,022	0.00%	*	0.00%	0.00%	*	*	*
Industrial	Photographic Film, Paper, Plate, and Chemical Manufacturing	325992	1,500	-\$1,022	0.00%	*	0.00%	0.00%	*	*	*
Industrial	All Other Miscellaneous Chemical Product and Preparation Manufacturing	325998	500	-\$1,022	-0.01%	-0.03%	0.00%	0.00%	0.00%	*	*
Industrial	Plastics Packaging Film and Sheet (including Laminated) Manufacturing	326112	1,000	-\$1,022	0.00%	-0.03%	0.00%	0.00%	*	*	*
Industrial	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing	326113	750	-\$1,022	0.00%	*	0.00%	0.00%	0.00%	*	*
Industrial	Unlaminated Plastics Profile Shape Manufacturing	326121	500		**	*, **	**	**	*, **	*, **	*, **
Industrial	Plastics Pipe and Pipe Fitting Manufacturing	326122	750		**	**	**	**	*, **	*, **	*, **
Industrial	Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing	326130	500	-\$1,022	-0.01%	*	-0.01%	*	*	*	*
Industrial	Polystyrene Foam Product Manufacturing	326140	1,000		**	*, **	**	**	**	*, **	*, **
Industrial	Urethane and Other Foam Product (except Polystyrene) Manufacturing	326150	750	-\$1,004	-0.01%	*	-0.01%	0.00%	*	*	*
Industrial	Plastics Plumbing Fixture Manufacturing	326191	750		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	All Other Plastics Product Manufacturing	326199	750	-\$1,022	-0.01%	-0.07%	-0.01%	0.00%	0.00%	0.00%	*
Industrial	Tire Manufacturing (except Retreading)	326211	1,500	-\$1,052	0.00%	*	*	0.00%	0.00%	0.00%	*
Industrial	Rubber and Plastics Hoses and Belting Manufacturing	326220	750	-\$1,022	0.00%	*	*	0.00%	0.00%	*	*
Industrial	Rubber Product Manufacturing for Mechanical Use	326291	750		**	*, **	*, **	**	**	*, **	*, **
Industrial	All Other Rubber Product Manufacturing	326299	500	-\$1,022	-0.01%	-0.05%	-0.01%	0.00%	*	*	*

(continued)

Table 6-6. Avoided Cost to Sales in Year 1 under ALTERNATIVE SCENARIO 1 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Pottery, Ceramics, and Plumbing Fixture Manufacturing	327110	1,000	-\$1,097	-0.03%	*	-0.02%	0.00%	*	*	*
Industrial	Clay Building Material and Refractories Manufacturing	327120	750	-\$1,022	-0.01%	-0.06%	-0.01%	0.00%	*	*	*
Industrial	Clay Refractory Manufacturing^	327124	500 (2007 Size Standards)	-\$975	-0.01%	*	*	*	*	*	*
Industrial	Flat Glass Manufacturing	327211	1,000		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Other Pressed and Blown Glass and Glassware Manufacturing	327212	1,250	-\$1,022	-0.01%	*	*	*	0.00%	*	*
Industrial	Cement Manufacturing	327310	1,000	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Lime Manufacturing	327410	750	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Gypsum Product Manufacturing	327420	1,500		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Abrasive Product Manufacturing	327910	750	-\$1,022	-0.01%	-0.04%	-0.01%	0.00%	0.00%	*	*
Industrial	Mineral Wool Manufacturing	327993	1,500	-\$1,022	-0.01%	*	-0.01%	0.00%	*	*	*
Industrial	All Other Miscellaneous Nonmetallic Mineral Product Manufacturing	327999	500		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Iron and Steel Mills and Ferroalloy Manufacturing	331110	1,500	-\$1,022	0.00%	*	*	0.00%	0.00%	0.00%	*
Industrial	Iron and Steel Mills^	331111	1000 (2007 Size Standards)	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Electrometallurgical Ferroalloy Product Manufacturing^	331112	750 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel	331210	1,000	-\$1,022	0.00%	-0.02%	0.00%	0.00%	0.00%	0.00%	*
Industrial	Rolled Steel Shape Manufacturing	331221	1,000	-\$1,022	0.00%	*	0.00%	*	*	*	*
Industrial	Primary Aluminum Production^	331312	1000 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Alumina Refining and Primary Aluminum Production	331313	1,000		**	*, **	**	**	**	*, **	*, **
Industrial	Secondary Smelting and Alloying of Aluminum	331314	750	-\$1,022	0.00%	*	0.00%	*	*	*	*
Industrial	Aluminum Sheet, Plate, and Foil Manufacturing	331315	1,250	-\$1,022	0.00%	*	*	0.00%	0.00%	*	*
Industrial	Aluminum Extruded Product Manufacturing^	331316	750 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Other Aluminum Rolling, Drawing, and Extruding	331318	750		**	*, **	*, **	**	*, **	*, **	*, **
Industrial	Nonferrous Metal (except Aluminum) Smelting and Refining	331410	1,000		**	*, **	**	*, **	**	*, **	*, **
Industrial	Primary Smelting and Refining of Copper^	331411	1000 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **

(continued)

Table 6-6. Avoided Cost to Sales in Year 1 under ALTERNATIVE SCENARIO 1 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20-99	100~499	500~999	1000~2499	≥2500
Industrial	Primary Smelting and Refining of Nonferrous Metal (except Copper and Aluminum)^	331419	750 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Copper Rolling, Drawing, Extruding, and Alloying	331420	1,000		**	*, **	**	**	**	*, **	*, **
Industrial	Copper Wire (except Mechanical) Drawing^	331422	1000 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, and Extruding	331491	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	331492	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Iron Foundries	331511	1,000	-\$1,022	0.00%	*	*	0.00%	0.00%	*	*
Industrial	Steel Foundries (except Investment)	331513	500		**	*, **	**	**	**	*, **	*, **
Industrial	Aluminum Die-Casting Foundries^	331521	500 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Aluminum Foundries (except Die-Casting)	331524	500		**	*, **	**	**	*, **	*, **	*, **
Industrial	Nonferrous Forging	332112	750	-\$1,022	0.00%	*	*	0.00%	0.00%	*	*
Industrial	Metal Crown, Closure, and Other Metal Stamping (except Automotive)	332119	500	-\$1,022	-0.01%	-0.07%	-0.01%	0.00%	0.00%	*	*
Industrial	Hand and Edge Tool Manufacturing^	332212	500 (2007 Size Standards)	-\$1,022	-0.02%	*	*	*	*	*	*
Industrial	Prefabricated Metal Building and Component Manufacturing	332311	750	-\$1,022	-0.01%	*	-0.01%	0.00%	*	*	*
Industrial	Fabricated Structural Metal Manufacturing	332312	500	-\$1,022	-0.01%	*	-0.01%	0.00%	*	*	*
Industrial	Metal Window and Door Manufacturing	332321	750	-\$1,022	-0.01%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Sheet Metal Work Manufacturing	332322	500	-\$1,022	-0.02%	-0.07%	-0.01%	0.00%	*	*	*
Industrial	Metal Can Manufacturing	332431	1,500	-\$1,022	0.00%	*	0.00%	0.00%	*	*	*
Industrial	Other Metal Container Manufacturing	332439	500	-\$1,022	-0.01%	-0.07%	-0.01%	0.00%	0.00%	*	*
Industrial	Bolt, Nut, Screw, Rivet, and Washer Manufacturing	332722	500	-\$1,022	-0.01%	-0.07%	-0.01%	0.00%	0.00%	*	*
Industrial	Metal Heat Treating	332811	750	-\$1,022	-0.01%	*	-0.01%	*	*	*	*
Industrial	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers	332812	500	-\$1,022	-0.02%	-0.12%	-0.01%	0.00%	*	*	*

(continued)

Table 6-6. Avoided Cost to Sales in Year 1 under ALTERNATIVE SCENARIO 1 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Electroplating, Plating, Polishing, Anodizing, and Coloring	332813	500	-\$1,022	-0.03%	-0.12%	-0.02%	*	*	*	*
Industrial	Other Fabricated Metal Manufacturing	332990	#N/A	-\$1,022	*	*	*	*	*	*	*
Industrial	Small Arms Ammunition Manufacturing	332992	1,250	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Ammunition (except Small Arms) Manufacturing	332993	1,500	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	All Other Miscellaneous Fabricated Metal Product Manufacturing	332999	750	-\$1,022	-0.02%	-0.11%	-0.01%	0.00%	0.00%	*	*
Industrial	Farm Machinery and Equipment Manufacturing	333111	1,250	-\$1,022	0.00%	*	-0.01%	0.00%	0.00%	0.00%	*
Industrial	Lawn and Garden Tractor and Home Lawn and Garden Equipment Manufacturing	333112	1,500		**	*, **	*, **	**	**	*, **	*, **
Industrial	Construction Machinery Manufacturing	333120	1,250	-\$1,022	0.00%	*	-0.01%	0.00%	0.00%	0.00%	*
Industrial	Mining Machinery and Equipment Manufacturing	333131	500		**	*, **	**	**	*, **	*, **	*, **
Industrial	Printing Machinery and Equipment Manufacturing^	333293	500 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Photographic and Photocopying Equipment Manufacturing	333316	1,000		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing	333415	1,250		**	**	**	**	**	**	*, **
Industrial	Machine Tool (Metal Cutting Types) Manufacturing^	333512	500 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Machine Tool (Metal Forming Types) Manufacturing^	333513	500 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Turbine and Turbine Generator Set Units Manufacturing	333611	1,500		**	*, **	*, **	**	**	**	*, **
Industrial	Other Engine Equipment Manufacturing	333618	1,500	-\$1,022	0.00%	-0.04%	0.00%	0.00%	0.00%	0.00%	*
Industrial	Overhead Traveling Crane, Hoist, and Monorail System Manufacturing	333923	1,250		**	*, **	**	**	*, **	*, **	*, **
Industrial	Welding and Soldering Equipment Manufacturing	333992	1,250		**	**	**	**	*, **	**	*, **

(continued)

Table 6-6. Avoided Cost to Sales in Year 1 under ALTERNATIVE SCENARIO 1 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	334220	1,250		**	**	**	**	**	**	**
Industrial	Electron Tube Manufacturing^	334411	750 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Bare Printed Circuit Board Manufacturing	334412	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Semiconductor and Related Device Manufacturing	334413	1,250	-\$1,003	0.00%	*	0.00%	0.00%	0.00%	0.00%	*
Industrial	Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use	334512	500		**	*, **	**	*, **	**	*, **	*, **
Industrial	Blank Magnetic and Optical Recording Media Manufacturing	334613	1,000		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Electric Lamp Bulb and Part Manufacturing	335110	1,250	-\$1,022	0.00%	*	*	0.00%	*	*	*
Industrial	Household Laundry Equipment Manufacturing	335224	1,250	-\$1,022	*	*	*	*	*	*	*
Industrial	Other Major Household Appliance Manufacturing	335228	1,000	-\$1,022	0.00%	*	*	*	0.00%	*	*
Industrial	Power, Distribution, and Specialty Transformer Manufacturing	335311	750	-\$1,022	0.00%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Motor and Generator Manufacturing	335312	1,250	-\$1,022	0.00%	*	-0.01%	0.00%	*	*	*
Industrial	Storage Battery Manufacturing	335911	1,250	-\$1,022	0.00%	*	*	0.00%	0.00%	*	*
Industrial	Current-Carrying Wiring Device Manufacturing	335931	500	-\$1,022	-0.01%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Noncurrent-Carrying Wiring Device Manufacturing	335932	1,000	-\$1,022	0.00%	*	0.00%	0.00%	*	*	*
Industrial	Carbon and Graphite Product Manufacturing	335991	750	-\$1,022	0.00%	*	-0.01%	0.00%	*	*	*
Industrial	Automobile Manufacturing	336111	1,500	-\$1,022	0.00%	*	*	*	*	0.00%	0.00%
Industrial	Light Truck and Utility Vehicle Manufacturing	336112	1,500	-\$1,022	0.00%	*	*	0.00%	*	*	0.00%
Industrial	Heavy Duty Truck Manufacturing	336120	1,500	-\$1,022	0.00%	*	*	*	0.00%	0.00%	*
Industrial	Motor Vehicle Body Manufacturing	336211	1,000	-\$1,022	-0.01%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Truck Trailer Manufacturing	336212	1,000		**	*, **	**	**	**	*, **	*, **
Industrial	Motor Vehicle Gasoline Engine and Engine Parts Manufacturing	336310	1,000		**	*, **	**	**	**	*, **	*, **
Industrial	Carburetor, Piston, Piston Ring, and Valve Manufacturing^	336311	500 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **

(continued)

Table 6-6. Avoided Cost to Sales in Year 1 under ALTERNATIVE SCENARIO 1 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Gasoline Engine and Engine Parts Manufacturing^	336312	750 (2007 Size Standards)	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing	336330	1,000		**	*, **	**	**	**	*, **	*, **
Industrial	Motor Vehicle Brake System Manufacturing	336340	1,250		**	*, **	**	**	**	*, **	*, **
Industrial	Motor Vehicle Transmission and Power Train Parts Manufacturing	336350	1,500		**	*, **	**	**	**	**	*, **
Industrial	Motor Vehicle Seating and Interior Trim Manufacturing	336360	1,500		**	*, **	**	**	**	*, **	*, **
Industrial	Motor Vehicle Metal Stamping	336370	1,000		**	**	**	**	**	**	*, **
Industrial	Other Motor Vehicle Parts Manufacturing	336390	1,000	-\$1,022	0.00%	-0.04%	0.00%	0.00%	0.00%	0.00%	*
Industrial	All Other Motor Vehicle Parts Manufacturing^	336399	750 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Aircraft Manufacturing	336411	1,500	-\$1,022	0.00%	*	-0.01%	0.00%	0.00%	0.00%	0.00%
Industrial	Aircraft Engine and Engine Parts Manufacturing	336412	1,500	-\$1,022	0.00%	-0.05%	-0.01%	0.00%	0.00%	0.00%	0.00%
Industrial	Other Aircraft Parts and Auxiliary Equipment Manufacturing	336413	1,250	-\$1,022	0.00%	*	-0.01%	0.00%	0.00%	*	0.00%
Industrial	Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing	336415	1,250		**	*, **	*, **	*, **	*, **	**	*, **
Industrial	Railroad Rolling Stock Manufacturing	336510	1,500		**	*, **	**	**	**	*, **	*, **
Industrial	Ship Building and Repairing	336611	1,250	-\$1,022	0.00%	-0.07%	-0.01%	0.00%	0.00%	0.00%	0.00%
Industrial	Boat Building	336612	1,000	-\$1,022	-0.01%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Military Armored Vehicle, Tank, and Tank Component Manufacturing	336992	1,500		**	*, **	*, **	**	*, **	*, **	*, **
Industrial	Wood Kitchen Cabinet and Countertop Manufacturing	337110	750	-\$1,022	-0.06%	*	*	0.00%	0.00%	*	*
Industrial	Upholstered Household Furniture Manufacturing	337121	1,000	-\$1,022	-0.01%	*	*	0.00%	0.00%	*	*
Industrial	Nonupholstered Wood Household Furniture Manufacturing	337122	750	-\$1,022	-0.06%	*	-0.02%	0.00%	*	*	*
Industrial	Institutional Furniture Manufacturing	337127	500	-\$1,022	-0.01%	*	-0.01%	0.00%	*	*	*
Industrial	Wood Office Furniture Manufacturing	337211	1,000	-\$1,022	-0.01%	*	-0.01%	0.00%	*	*	*

(continued)

Table 6-6. Avoided Cost to Sales in Year 1 under ALTERNATIVE SCENARIO 1 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20-99	100~499	500~999	1000~2499	≥2500
Industrial	Office Furniture (except Wood) Manufacturing	337214	1,000	-\$1,022	0.00%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Showcase, Partition, Shelving, and Locker Manufacturing	337215	500	-\$1,022	-0.02%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Blind and Shade Manufacturing	337920	1,000	-\$1,022	-0.02%	*	-0.01%	0.00%	*	*	*
Industrial	Surgical and Medical Instrument Manufacturing	339112	1,000		**	*, **	*, **	**	**	**	*, **
Industrial	Surgical Appliance and Supplies Manufacturing	339113	750		**	*, **	*, **	**	**	**	*, **
Industrial	Jewelry and Silverware Manufacturing	339910	500		**	**	**	*, **	*, **	*, **	*, **
Industrial	Sporting and Athletic Goods Manufacturing	339920	750		**	**	**	**	**	**	*, **
Industrial	Office Supplies (except Paper) Manufacturing	339940	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Gasket, Packing, and Sealing Device Manufacturing	339991	500		**	*, **	**	**	**	*, **	*, **
Industrial	Burial Casket Manufacturing	339995	1,000	-\$1,022	-0.01%	*	*	*	*	*	*
Industrial	All Other Miscellaneous Manufacturing	339999	500	-\$1,022	-0.05%	-0.19%	-0.01%	0.00%	*	*	*
Commercial	Grain and Field Bean Merchant Wholesalers	424510	200		**	**	**	*, **	*, **	*, **	*, **
Commercial	Petroleum Bulk Stations and Terminals	424710	200	-\$1,022	0.00%	0.00%	0.00%	*	*	*	*
Commercial	Scheduled Passenger Air Transportation	481111	1,500		**	**	**	*, **	*, **	*, **	*, **
Commercial	Line-Haul Railroads	482111	1,500		*, **	*, **	*, **	*, **	*, **	*, **	*, **
Energy	Pipeline Transportation of Crude Oil	486110	1,500		**	**	**	*, **	*, **	*, **	*, **
Energy	Pipeline Transportation of Natural Gas	486210	\$27.5 million	-\$1,022	-0.01%	-0.02%	0.00%	*	*	*	*
Energy	Pipeline Transportation of Refined Petroleum Products	486910	1,500		**	**	*, **	*, **	*, **	*, **	*, **
Commercial	Support Activities for Rail Transportation	488210	\$15 million	-\$1,022	-0.03%	-0.09%	-0.01%	*	*	*	*
Commercial	Marine Cargo Handling	488320	\$38.5 million		**	**	**	*, **	*, **	*, **	*, **
Commercial	General Warehousing and Storage	493110	\$27.5 million	-\$1,022	-0.06%	-0.11%	-0.03%	*	*	*	*
Commercial	Other Warehousing and Storage	493190	\$27.5 million	-\$1,022	-0.04%	-0.14%	-0.03%	*	*	*	*
Commercial	Lessors of Nonresidential Buildings (except Miniwarehouses)	531120	\$27.5 million		**	**	**	*, **	*, **	*, **	*, **
Commercial	Testing Laboratories	541380	\$15 million		**	**	**	*, **	*, **	*, **	*, **

(continued)

Table 6-6. Avoided Cost to Sales in Year 1 under ALTERNATIVE SCENARIO 1 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Commercial	Research and Development in the Physical, Engineering and Life Sciences (except Nanotechnology and Biotechnology) ^{^^}	541715	1,000		*, **	*, **	*, **	*, **	*, **	*, **	*, **
Commercial	All Other Support Services	561990	\$11 million		**	**	**	*, **	*, **	*, **	*, **
Waste Treatment	Hazardous Waste Treatment and Disposal	562211	\$38.5 million	-\$1,022	-0.01%	-0.06%	-0.01%	*	*	*	*
Waste Treatment	Solid Waste Landfill	562212	\$38.5 million	-\$1,022	-0.02%	-0.05%	-0.01%	*	*	*	*
Waste Treatment	Solid Waste Combustors and Incinerators	562213	\$38.5 million	-\$1,022	0.00%	*	0.00%	*	*	*	*
Waste Treatment	Remediation Services	562910	\$20.5 million		**	**	**	*, **	*, **	*, **	*, **
Educational Services	Colleges, Universities, and Professional Schools	611310	\$27.5 million	-\$1,022	*	*	*	*	*	*	*
Commercial	Amusement and Theme Parks	713110	\$38.5 million		**	**	**	*, **	*, **	*, **	*, **
Commercial	Linen and Uniform Supply	812330	#N/A		*, **	*, **	*, **	*, **	*, **	*, **	*, **
Commercial	Industrial Launderers	812332	\$38.5 million	-\$1,022	-0.02%	-0.07%	-0.02%	*	*	*	*

Notes:

Blanks in “Average Avoided Cost/Entity” column are for NAICS where zero facilities are eligible to obtain area source status. NA means it is not a valid 2012 NAICS code, thus SBA Size Standards are not available.

*No receipts data available from Census; cost-to-sales ratios cannot be calculated.

**Zero facilities estimated to obtain area source status and no estimated net costs (savings); cost-to-sales ratios cannot be calculated.

Sources: 2012 Economic Census, 2012 County Business Patterns, 2017 SBA Size Standards, Federal Reserve Bank of St. Louis Economic Research, Eastern Research Group. August 2020a. ERG MM2A Database Memorandum, Analytical Evaluations & Summary of Industries Potentially Impacted by the Final Rule “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD; Eastern Research Group. August 2020b. ERG MM2A Cost Analysis Memorandum, Compliance cost savings analysis for the final rulemaking “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD. August, 2020.7-18, SBA February 2016 Size Standards, SBA 2007 Size Standards.

Table 6-7. Avoided Cost to Sales in Year 5 under ALTERNATIVE SCENARIO 1

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Agriculture	Postharvest Crop Activities (except Cotton Ginning)	115114	\$27.5 million		*, **	*, **	*, **	*, **	*, **	*, **	*, **
Energy	Crude Petroleum and Natural Gas Extraction	211111	1250 (Feb 2016 Size Standards)	11,168	0.02%	*	0.01%	0.00%	0.00%	0.00%	*
Energy	Natural Gas Liquid Extraction	211112	750 (Feb 2016 Size Standards)	40,400	0.03%	0.06%	0.03%	0.01%	0.00%	*	*
Industrial	Iron Ore Mining	212210	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Lead Ore and Zinc Ore Mining	212231	750 (Feb 2016 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Copper Ore and Nickel Ore Mining	212234	1500 (Feb 2016 Size Standards)		**	*, **	*, **	*, **	**	*, **	*, **
Industrial	All Other Metal Ore Mining	212299	750		**	*, **	*, **	**	*, **	*, **	*, **
Industrial	Industrial Sand Mining	212322	500		**	**	**	**	*, **	*, **	*, **
Industrial	Kaolin and Ball Clay Mining	212324	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Potash, Soda, and Borate Mineral Mining	212391	750		**	*, **	*, **	*, **	**	*, **	*, **
Industrial	All Other Nonmetallic Mineral Mining	212399	500		**	*, **	**	*, **	*, **	*, **	*, **
Energy	Support Activities for Oil and Gas Operations	213112	\$38.5 million	15,247	0.16%	0.69%	0.16%	0.03%	0.01%	0.00%	*
Utilities	Hydroelectric Power Generation	221111	500	15,247	0.23%	*	*	*	*	*	*
Utilities	Fossil Fuel Electric Power Generation	221112	750	41,506	0.07%	*	*	*	*	*	*
Utilities	Biomass Electric Power Generation	221117	250	63,290	0.87%	*	*	*	*	*	*
Utilities	Other Electric Power Generation	221118	250	15,247	0.59%	*	*	*	*	*	*
Utilities	Other Electric Power Generation^	221119	4 million MWH (2007 Size Standards)	57,102	0.52%	*	*	*	*	*	*
Utilities	Electric Power Distribution	221122	1,000	15,247	0.03%	*	*	*	*	*	*
Utilities	Natural Gas Distribution	221210	1,000	45,144	0.11%	*	*	*	*	*	*
Utilities	Water Supply and Irrigation Systems	221310	\$27.5 million	23,798	0.94%	*	*	*	*	*	*
Utilities	Sewage Treatment Facilities	221320	\$20.5 million	25,316	1.21%	*	*	*	*	*	*
Utilities	Steam and Air-Conditioning Supply	221330	\$15 million	34,071	0.21%	*	*	*	*	*	*
Industrial	Other Animal Food Manufacturing	311119	500		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Wet Corn Milling	311221	1,250		**	*, **	**	**	*, **	*, **	*, **
Industrial	Soybean Processing^	311222	500 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Other Oilseed Processing^	311223	1000 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Soybean and Other Oilseed Processing	311224	1,000	35,287	0.01%	*	0.01%	*	*	*	*
Industrial	Fats and Oils Refining and Blending	311225	1,000		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Beet Sugar Manufacturing	311313	750		**	*, **	*, **	*, **	**	*, **	*, **

(continued)

Table 6-7. Avoided Cost to Sales in Year 5 under ALTERNATIVE SCENARIO 1 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Cane Sugar Manufacturing	311314	1,000		**	*, **	*, **	**	*, **	*, **	*, **
Industrial	Frozen Fruit, Juice, and Vegetable Manufacturing	311411	1,000		**	*, **	*, **	**	*, **	*, **	*, **
Industrial	Fruit and Vegetable Canning	311421	1,000		**	*, **	**	**	*, **	*, **	*, **
Industrial	Specialty Canning	311422	1,250		**	*, **	*, **	*, **	**	*, **	*, **
Industrial	Cheese Manufacturing	311513	1,250		**	**	**	**	**	**	*, **
Industrial	Dry, Condensed, and Evaporated Dairy Product Manufacturing	311514	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Rendering and Meat Byproduct Processing	311613	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Commercial Bakeries	311812	1,000		**	*, **	**	**	**	*, **	*, **
Industrial	Other Snack Food Manufacturing	311919	1,250		**	*, **	**	**	*, **	*, **	*, **
Industrial	Coffee and Tea Manufacturing	311920	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Flavoring Syrup and Concentrate Manufacturing	311930	1,000		**	*, **	*, **	**	*, **	*, **	*, **
Industrial	Spice and Extract Manufacturing	311942	500		**	*, **	**	**	*, **	*, **	*, **
Industrial	All Other Miscellaneous Food Manufacturing	311999	500		**	*, **	**	**	**	*, **	*, **
Industrial	Breweries	312120	1,250	15,247	0.04%	*	0.10%	*	*	*	*
Industrial	Distilleries	312140	1,000		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Tobacco Manufacturing	312230	1,500		**	*, **	*, **	**	**	*, **	*, **
Industrial	Yarn Spinning Mills^	313111	500 (2007 Size Standards)	15,247	0.06%	*	*	*	*	*	*
Industrial	Thread Mills^	313113	500 (2007 Size Standards)	15,247	0.23%	*	*	*	*	*	*
Industrial	Broadwoven Fabric Mills	313210	1,000	23,798	0.17%	*	0.19%	0.04%	0.02%	*	*
Industrial	Narrow Fabric Mills^	313221	500 (2007 Size Standards)	15,247	0.22%	*	*	*	*	*	*
Industrial	Textile and Fabric Finishing Mills	313310	1,000	15,247	0.24%	*	0.12%	0.03%	*	*	*
Industrial	Broadwoven Fabric Finishing Mills^	313311	1000 (2007 Size Standards)	23,798	0.33%	*	*	*	*	*	*
Industrial	Fabric Coating Mills	313320	1,000	20,646	0.15%	*	0.11%	*	*	*	*
Industrial	Tire Cord and Tire Fabric Mills^	314992	1000 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Leather and Hide Tanning and Finishing	316110	500	13,119	0.16%	*	0.04%	0.02%	*	*	*
Industrial	Sawmills	321113	500	43,544	0.63%	3.10%	0.32%	0.08%	*	*	*
Industrial	Wood Preservation	321114	500		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Hardwood Veneer and Plywood Manufacturing	321211	500		**	*, **	*, **	**	*, **	*, **	*, **
Industrial	Softwood Veneer and Plywood Manufacturing	321212	1,250	20,948	0.05%	*	*	0.02%	0.01%	*	*
Industrial	Engineered Wood Member (except Truss) Manufacturing	321213	750		**	*, **	*, **	**	*, **	*, **	*, **
Industrial	Reconstituted Wood Product Manufacturing	321219	750	25,784	0.08%	*	*	0.03%	*	*	*

(continued)

Table 6-7. Avoided Cost to Sales in Year 5 under ALTERNATIVE SCENARIO 1 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Wood Window and Door Manufacturing	321911	1,000		**	*, **	*, **	**	*, **	*, **	*, **
Industrial	Cut Stock, Resawing Lumber, and Planing	321912	500		**	**	**	*, **	*, **	*, **	*, **
Industrial	All Other Miscellaneous Wood Product Manufacturing	321999	500		**	**	**	**	*, **	*, **	*, **
Industrial	Pulp Mills	322110	750	20,948	0.01%	*	*	0.01%	0.00%	*	*
Industrial	Paper (except Newsprint) Mills	322121	1,250	12,986	0.00%	*	*	0.01%	0.00%	0.00%	*
Industrial	Newsprint Mills	322122	750	15,247	0.01%	*	*	*	*	*	*
Industrial	Paperboard Mills	322130	1,250	50,126	0.03%	*	*	0.02%	0.01%	*	*
Industrial	Corrugated and Solid Fiber Box Manufacturing	322211	1,250	958	0.00%	0.03%	0.00%	0.00%	*	*	*
Industrial	Paper Bag and Coated and Treated Paper Manufacturing	322220	750	23,798	0.08%	*	0.11%	0.03%	0.00%	*	*
Industrial	Coated and Laminated Paper Manufacturing^	322222	500 (2007 Size Standards)	23,798	0.08%	*	*	*	*	*	*
Industrial	Sanitary Paper Product Manufacturing	322291	1,500		**	*, **	*, **	**	**	*, **	*, **
Industrial	All Other Converted Paper Product Manufacturing	322299	500		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Commercial Lithographic Printing^	323110	500 (2007 Size Standards)	15,247	0.37%	*	*	*	*	*	*
Industrial	Commercial Printing (except Screen and Books)	323111	500	20,192	0.58%	*	0.24%	0.05%	0.01%	*	*
Industrial	Books Printing	323117	1,250	23,798	0.25%	*	*	0.05%	0.02%	*	*
Industrial	Petroleum Refineries	324110	1,500	97,382	0.00%	*	0.04%	0.00%	*	0.00%	*
Industrial	Asphalt Shingle and Coating Materials Manufacturing	324122	750		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	All Other Petroleum and Coal Products Manufacturing	324199	500		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Petrochemical Manufacturing	325110	1,000	15,982	0.00%	*	*	0.00%	*	*	*
Industrial	Industrial Gas Manufacturing	325120	1,000	15,247	0.09%	0.22%	0.06%	*	*	*	*
Industrial	Synthetic Dye and Pigment Manufacturing	325130	1,000		**	*, **	**	**	*, **	*, **	*, **
Industrial	Inorganic Dye and Pigment Manufacturing^	325131	1000 (2007 Size Standards)	15,247	0.02%	*	*	*	*	*	*
Industrial	Synthetic Organic Dye and Pigment Manufacturing^	325132	750 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Other Basic Inorganic Chemical Manufacturing	325180	1,000	23,798	0.04%	*	0.04%	0.01%	0.01%	*	*
Industrial	Alkalies and Chlorine Manufacturing^	325181	1000 (2007 Size Standards)	22,921	0.01%	*	*	*	*	*	*
Industrial	Carbon Black Manufacturing^	325182	500 (2007 Size Standards)	28,397	0.03%	*	*	*	*	*	*

(continued)

Table 6-7. Avoided Cost to Sales in Year 5 under ALTERNATIVE SCENARIO 1 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	All Other Basic Inorganic Chemical Manufacturing [^]	325188	1000 (2007 Size Standards)	28,199	0.06%	*	*	*	*	*	*
Industrial	Cyclic Crude and Intermediate Manufacturing [^]	325192	750 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Ethyl Alcohol Manufacturing	325193	1,000	23,798	0.01%	*	0.01%	0.00%	*	*	*
Industrial	Cyclic Crude, Intermediate, and Gum and Wood Chemical Manufacturing	325194	1,250		**	*, **	**	**	*, **	*, **	*, **
Industrial	All Other Basic Organic Chemical Manufacturing	325199	1,250	60,117	0.05%	*	0.10%	0.02%	0.00%	0.00%	*
Industrial	Plastics Material and Resin Manufacturing	325211	1,250	33,170	0.04%	*	0.07%	0.01%	0.00%	0.00%	*
Industrial	Synthetic Rubber Manufacturing	325212	1,000	6,981	0.01%	*	0.01%	*	*	*	*
Industrial	Artificial and Synthetic Fibers and Filaments Manufacturing	325220	1,000	23,798	0.03%	*	0.10%	0.02%	0.00%	*	*
Industrial	Cellulosic Organic Fiber Manufacturing [^]	325221	1000 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Noncellulosic Organic Fiber Manufacturing [^]	325222	1000 (2007 Size Standards)	26,809	0.04%	*	*	*	*	*	*
Industrial	Nitrogenous Fertilizer Manufacturing	325311	1,000	63,290	0.12%	*	0.11%	*	*	*	*
Industrial	Phosphatic Fertilizer Manufacturing	325312	750	23,798	0.01%	*	*	*	*	*	*
Industrial	Pesticide and Other Agricultural Chemical Manufacturing	325320	1,000	52,514	0.07%	*	0.08%	0.02%	*	*	*
Industrial	Medicinal and Botanical Manufacturing	325411	1,000	15,247	0.05%	*	0.08%	0.02%	0.00%	*	*
Industrial	Pharmaceutical Preparation Manufacturing	325412	1,250	12,184	0.01%	*	*	0.00%	0.00%	0.00%	*
Industrial	Biological Product (except Diagnostic) Manufacturing	325414	1,250		**	*, **	*, **	**	**	**	*, **
Industrial	Paint and Coating Manufacturing	325510	1,000	128,442	0.58%	*	0.41%	0.09%	*	*	*
Industrial	Adhesive Manufacturing	325520	500	15,247	0.06%	0.35%	0.05%	0.01%	*	*	*
Industrial	Surface Active Agent Manufacturing	325613	750		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Toilet Preparation Manufacturing	325620	1,250		**	**	**	**	**	**	*, **
Industrial	Explosives Manufacturing	325920	750		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Custom Compounding of Purchased Resins	325991	500	23,798	0.10%	*	0.08%	0.02%	*	*	*
Industrial	Photographic Film, Paper, Plate, and Chemical Manufacturing	325992	1,500	15,247	0.05%	*	0.07%	0.01%	*	*	*

(continued)

Table 6-7. Avoided Cost to Sales in Year 5 under ALTERNATIVE SCENARIO 1 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	All Other Miscellaneous Chemical Product and Preparation Manufacturing	325998	500	23,798	0.13%	0.73%	0.08%	0.02%	0.01%	*	*
Industrial	Plastics Packaging Film and Sheet (including Laminated) Manufacturing	326112	1,000	23,798	0.07%	0.73%	0.11%	0.03%	*	*	*
Industrial	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing	326113	750	50,126	0.16%	*	0.22%	0.05%	0.02%	*	*
Industrial	Unlaminated Plastics Profile Shape Manufacturing	326121	500		**	*, **	**	**	*, **	*, **	*, **
Industrial	Plastics Pipe and Pipe Fitting Manufacturing	326122	750		**	**	**	**	*, **	*, **	*, **
Industrial	Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing	326130	500	23,798	0.15%	*	0.14%	*	*	*	*
Industrial	Polystyrene Foam Product Manufacturing	326140	1,000		**	*, **	**	**	**	*, **	*, **
Industrial	Urethane and Other Foam Product (except Polystyrene) Manufacturing	326150	750	10,726	0.07%	*	0.06%	0.02%	*	*	*
Industrial	Plastics Plumbing Fixture Manufacturing	326191	750		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	All Other Plastics Product Manufacturing	326199	750	42,540	0.31%	2.73%	0.36%	0.08%	0.02%	0.01%	*
Industrial	Tire Manufacturing (except Retreading)	326211	1,500	40,779	0.02%	*	*	0.03%	0.01%	0.01%	*
Industrial	Rubber and Plastics Hoses and Belting Manufacturing	326220	750	23,798	0.11%	*	*	0.03%	0.02%	*	*
Industrial	Rubber Product Manufacturing for Mechanical Use	326291	750		**	*, **	*, **	**	**	*, **	*, **
Industrial	All Other Rubber Product Manufacturing	326299	500	20,948	0.12%	1.02%	0.14%	0.03%	*	*	*
Industrial	Pottery, Ceramics, and Plumbing Fixture Manufacturing	327110	1,000	16,425	0.47%	*	0.23%	0.04%	*	*	*
Industrial	Clay Building Material and Refractories Manufacturing	327120	750	14,991	0.16%	0.89%	0.14%	0.03%	*	*	*
Industrial	Clay Refractory Manufacturing^	327124	500 (2007 Size Standards)	14,600	0.15%	*	*	*	*	*	*
Industrial	Flat Glass Manufacturing	327211	1,000		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Other Pressed and Blown Glass and Glassware Manufacturing	327212	1,250	17,311	0.19%	*	*	*	0.01%	*	*
Industrial	Cement Manufacturing	327310	1,000	23,798	0.09%	*	*	*	*	*	*
Industrial	Lime Manufacturing	327410	750	15,247	0.06%	*	*	*	*	*	*

(continued)

Table 6-7. Avoided Cost to Sales in Year 5 under ALTERNATIVE SCENARIO 1 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Gypsum Product Manufacturing	327420	1,500		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Abrasive Product Manufacturing	327910	750	15,247	0.08%	0.65%	0.09%	0.01%	0.00%	*	*
Industrial	Mineral Wool Manufacturing	327993	1,500	27,554	0.14%	*	0.19%	0.03%	*	*	*
Industrial	All Other Miscellaneous Nonmetallic Mineral Product Manufacturing	327999	500		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Iron and Steel Mills and Ferroalloy Manufacturing	331110	1,500	34,964	0.01%	*	*	0.01%	0.00%	0.00%	*
Industrial	Iron and Steel Mills^	331111	1000 (2007 Size Standards)	23,798	0.01%	*	*	*	*	*	*
Industrial	Electrometallurgical Ferroalloy Product Manufacturing^	331112	750 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel	331210	1,000	15,247	0.02%	0.30%	0.05%	0.01%	0.00%	0.00%	*
Industrial	Rolled Steel Shape Manufacturing	331221	1,000	15,247	0.05%	*	0.04%	*	*	*	*
Industrial	Primary Aluminum Production^	331312	1000 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Alumina Refining and Primary Aluminum Production	331313	1,000		**	*, **	**	**	**	*, **	*, **
Industrial	Secondary Smelting and Alloying of Aluminum	331314	750	2,987	0.01%	*	0.01%	*	*	*	*
Industrial	Aluminum Sheet, Plate, and Foil Manufacturing	331315	1,250	15,247	0.01%	*	*	0.01%	0.00%	*	*
Industrial	Aluminum Extruded Product Manufacturing^	331316	750 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Other Aluminum Rolling, Drawing, and Extruding	331318	750		**	*, **	*, **	**	*, **	*, **	*, **
Industrial	Nonferrous Metal (except Aluminum) Smelting and Refining	331410	1,000		**	*, **	**	*, **	**	*, **	*, **
Industrial	Primary Smelting and Refining of Copper^	331411	1000 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Primary Smelting and Refining of Nonferrous Metal (except Copper and Aluminum)^	331419	750 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Copper Rolling, Drawing, Extruding, and Alloying	331420	1,000		**	*, **	**	**	**	*, **	*, **
Industrial	Copper Wire (except Mechanical) Drawing^	331422	1000 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, and Extruding	331491	750		**	*, **	**	**	*, **	*, **	*, **

(continued)

Table 6-7. Avoided Cost to Sales in Year 5 under ALTERNATIVE SCENARIO 1 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	331492	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Iron Foundries	331511	1,000	20,948	0.07%	*	*	0.03%	0.01%	*	*
Industrial	Steel Foundries (except Investment)	331513	500		**	*, **	**	**	**	*, **	*, **
Industrial	Aluminum Die-Casting Foundries^	331521	500 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Aluminum Foundries (except Die-Casting)	331524	500		**	*, **	**	**	*, **	*, **	*, **
Industrial	Nonferrous Forging	332112	750	15,247	0.03%	*	*	0.02%	0.00%	*	*
Industrial	Metal Crown, Closure, and Other Metal Stamping (except Automotive)	332119	500	15,247	0.18%	1.08%	0.15%	0.03%	0.01%	*	*
Industrial	Hand and Edge Tool Manufacturing^	332212	500 (2007 Size Standards)	15,247	0.25%	*	*	*	*	*	*
Industrial	Prefabricated Metal Building and Component Manufacturing	332311	750	15,247	0.15%	*	0.10%	0.03%	*	*	*
Industrial	Fabricated Structural Metal Manufacturing	332312	500	15,247	0.16%	*	0.11%	0.02%	*	*	*
Industrial	Metal Window and Door Manufacturing	332321	750	63,290	0.64%	*	0.61%	0.13%	0.04%	*	*
Industrial	Sheet Metal Work Manufacturing	332322	500	15,247	0.29%	1.11%	0.17%	0.04%	*	*	*
Industrial	Metal Can Manufacturing	332431	1,500	47,702	0.05%	*	0.08%	0.03%	*	*	*
Industrial	Other Metal Container Manufacturing	332439	500	23,798	0.21%	1.69%	0.15%	0.05%	0.01%	*	*
Industrial	Bolt, Nut, Screw, Rivet, and Washer Manufacturing	332722	500	15,247	0.12%	1.00%	0.12%	0.03%	0.01%	*	*
Industrial	Metal Heat Treating	332811	750	15,247	0.17%	*	0.17%	*	*	*	*
Industrial	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers	332812	500	47,954	0.86%	5.69%	0.46%	0.06%	*	*	*
Industrial	Electroplating, Plating, Polishing, Anodizing, and Coloring	332813	500	23,798	0.74%	2.90%	0.39%	*	*	*	*
Industrial	Other Fabricated Metal Manufacturing	332990	#N/A	15,247	*	*	*	*	*	*	*
Industrial	Small Arms Ammunition Manufacturing	332992	1,250	15,247	0.04%	*	*	*	*	*	*
Industrial	Ammunition (except Small Arms) Manufacturing	332993	1,500	23,798	0.03%	*	*	*	*	*	*
Industrial	All Other Miscellaneous Fabricated Metal Product Manufacturing	332999	750	23,798	0.57%	2.65%	0.29%	0.05%	0.01%	*	*

(continued)

Table 6-7. Avoided Cost to Sales in Year 5 under ALTERNATIVE SCENARIO 1 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Farm Machinery and Equipment Manufacturing	333111	1,250	20,948	0.06%	*	0.16%	0.02%	0.00%	0.00%	*
Industrial	Lawn and Garden Tractor and Home Lawn and Garden Equipment Manufacturing	333112	1,500		**	*, **	*, **	**	**	*, **	*, **
Industrial	Construction Machinery Manufacturing	333120	1,250	12,537	0.02%	*	0.08%	0.01%	0.00%	0.00%	*
Industrial	Mining Machinery and Equipment Manufacturing	333131	500		**	*, **	**	**	*, **	*, **	*, **
Industrial	Printing Machinery and Equipment Manufacturing^	333293	500 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Photographic and Photocopying Equipment Manufacturing	333316	1,000		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing	333415	1,250		**	**	**	**	**	**	*, **
Industrial	Machine Tool (Metal Cutting Types) Manufacturing^	333512	500 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Machine Tool (Metal Forming Types) Manufacturing^	333513	500 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Turbine and Turbine Generator Set Units Manufacturing	333611	1,500		**	*, **	*, **	**	**	**	*, **
Industrial	Other Engine Equipment Manufacturing	333618	1,500	23,798	0.03%	0.94%	0.11%	0.02%	0.00%	0.00%	*
Industrial	Overhead Traveling Crane, Hoist, and Monorail System Manufacturing	333923	1,250		**	*, **	**	**	*, **	*, **	*, **
Industrial	Welding and Soldering Equipment Manufacturing	333992	1,250		**	**	**	**	*, **	**	*, **
Industrial	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	334220	1,250		**	**	**	**	**	**	**
Industrial	Electron Tube Manufacturing^	334411	750 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Bare Printed Circuit Board Manufacturing	334412	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Semiconductor and Related Device Manufacturing	334413	1,250	39,543	0.07%	*	0.13%	0.05%	0.01%	0.00%	*
Industrial	Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use	334512	500		**	*, **	**	*, **	**	*, **	*, **

(continued)

Table 6-7. Avoided Cost to Sales in Year 5 under ALTERNATIVE SCENARIO 1 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Blank Magnetic and Optical Recording Media Manufacturing	334613	1,000		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Electric Lamp Bulb and Part Manufacturing	335110	1,250	15,247	0.05%	*	*	0.03%	*	*	*
Industrial	Household Laundry Equipment Manufacturing	335224	1,250	36,433	*	*	*	*	*	*	*
Industrial	Other Major Household Appliance Manufacturing	335228	1,000	23,798	0.01%	*	*	*	0.01%	*	*
Industrial	Power, Distribution, and Specialty Transformer Manufacturing	335311	750	15,247	0.06%	*	0.11%	0.02%	0.01%	*	*
Industrial	Motor and Generator Manufacturing	335312	1,250	23,798	0.09%	*	0.20%	0.03%	*	*	*
Industrial	Storage Battery Manufacturing	335911	1,250	15,247	0.03%	*	*	0.02%	0.01%	*	*
Industrial	Current-Carrying Wiring Device Manufacturing	335931	500	15,247	0.09%	*	0.13%	0.03%	0.01%	*	*
Industrial	Noncurrent-Carrying Wiring Device Manufacturing	335932	1,000	15,247	0.04%	*	0.07%	0.02%	*	*	*
Industrial	Carbon and Graphite Product Manufacturing	335991	750	63,290	0.26%	*	0.38%	0.08%	*	*	*
Industrial	Automobile Manufacturing	336111	1,500	43,396	0.01%	*	*	*	*	0.00%	0.00%
Industrial	Light Truck and Utility Vehicle Manufacturing	336112	1,500	23,798	0.00%	*	*	0.04%	*	*	0.00%
Industrial	Heavy Duty Truck Manufacturing	336120	1,500	23,798	0.01%	*	*	*	0.00%	0.00%	*
Industrial	Motor Vehicle Body Manufacturing	336211	1,000	23,798	0.15%	*	0.21%	0.04%	0.01%	*	*
Industrial	Truck Trailer Manufacturing	336212	1,000		**	*, **	**	**	**	*, **	*, **
Industrial	Motor Vehicle Gasoline Engine and Engine Parts Manufacturing	336310	1,000		**	*, **	**	**	**	*, **	*, **
Industrial	Carburetor, Piston, Piston Ring, and Valve Manufacturing^	336311	500 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Gasoline Engine and Engine Parts Manufacturing^	336312	750 (2007 Size Standards)	15,247	0.04%	*	*	*	*	*	*
Industrial	Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing	336330	1,000		**	*, **	**	**	**	*, **	*, **
Industrial	Motor Vehicle Brake System Manufacturing	336340	1,250		**	*, **	**	**	**	*, **	*, **
Industrial	Motor Vehicle Transmission and Power Train Parts Manufacturing	336350	1,500		**	*, **	**	**	**	**	*, **
Industrial	Motor Vehicle Seating and Interior Trim Manufacturing	336360	1,500		**	*, **	**	**	**	*, **	*, **
Industrial	Motor Vehicle Metal Stamping	336370	1,000		**	**	**	**	**	**	*, **
Industrial	Other Motor Vehicle Parts Manufacturing	336390	1,000	20,948	0.05%	0.77%	0.10%	0.02%	0.01%	0.00%	*

(continued)

Table 6-7. Avoided Cost to Sales in Year 5 under ALTERNATIVE SCENARIO 1 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	All Other Motor Vehicle Parts Manufacturing [^]	336399	750 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Aircraft Manufacturing	336411	1,500	109,348	0.03%	*	1.06%	0.11%	0.04%	0.01%	0.00%
Industrial	Aircraft Engine and Engine Parts Manufacturing	336412	1,500	23,798	0.03%	1.13%	0.17%	0.02%	0.01%	0.00%	0.00%
Industrial	Other Aircraft Parts and Auxiliary Equipment Manufacturing	336413	1,250	20,948	0.05%	*	0.15%	0.03%	0.01%	*	0.00%
Industrial	Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing	336415	1,250		**	*, **	*, **	*, **	*, **	**	*, **
Industrial	Railroad Rolling Stock Manufacturing	336510	1,500		**	*, **	**	**	**	*, **	*, **
Industrial	Ship Building and Repairing	336611	1,250	49,758	0.13%	3.22%	0.45%	0.08%	0.03%	0.01%	0.00%
Industrial	Boat Building	336612	1,000	14,721	0.17%	*	0.14%	0.02%	0.01%	*	*
Industrial	Military Armored Vehicle, Tank, and Tank Component Manufacturing	336992	1,500		**	*, **	*, **	**	*, **	*, **	*, **
Industrial	Wood Kitchen Cabinet and Countertop Manufacturing	337110	750	8,932	0.53%	*	*	0.02%	0.01%	*	*
Industrial	Upholstered Household Furniture Manufacturing	337121	1,000	23,798	0.26%	*	*	0.07%	0.02%	*	*
Industrial	Nonupholstered Wood Household Furniture Manufacturing	337122	750	43,544	2.38%	*	0.74%	0.15%	*	*	*
Industrial	Institutional Furniture Manufacturing	337127	500	15,247	0.22%	*	0.20%	0.04%	*	*	*
Industrial	Wood Office Furniture Manufacturing	337211	1,000	63,290	0.86%	*	0.85%	0.13%	*	*	*
Industrial	Office Furniture (except Wood) Manufacturing	337214	1,000	26,321	0.07%	*	0.29%	0.04%	0.01%	*	*
Industrial	Showcase, Partition, Shelving, and Locker Manufacturing	337215	500	15,247	0.23%	*	0.18%	0.04%	0.01%	*	*
Industrial	Blind and Shade Manufacturing	337920	1,000	15,247	0.29%	*	0.18%	0.04%	*	*	*
Industrial	Surgical and Medical Instrument Manufacturing	339112	1,000		**	*, **	*, **	**	**	**	*, **
Industrial	Surgical Appliance and Supplies Manufacturing	339113	750		**	*, **	*, **	**	**	**	*, **
Industrial	Jewelry and Silverware Manufacturing	339910	500		**	**	**	*, **	*, **	*, **	*, **
Industrial	Sporting and Athletic Goods Manufacturing	339920	750		**	**	**	**	**	**	*, **
Industrial	Office Supplies (except Paper) Manufacturing	339940	750		**	*, **	**	**	*, **	*, **	*, **

(continued)

Table 6-7. Avoided Cost to Sales in Year 5 under ALTERNATIVE SCENARIO 1 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Gasket, Packing, and Sealing Device Manufacturing	339991	500		**	*, **	**	**	**	*, **	*, **
Industrial	Burial Casket Manufacturing	339995	1,000	15,247	0.21%	*	*	*	*	*	*
Industrial	All Other Miscellaneous Manufacturing	339999	500	23,798	1.12%	4.47%	0.34%	0.03%	*	*	*
Commercial	Grain and Field Bean Merchant Wholesalers	424510	200		**	**	**	*, **	*, **	*, **	*, **
Commercial	Petroleum Bulk Stations and Terminals	424710	200	23,798	0.01%	0.03%	0.01%	*	*	*	*
Commercial	Scheduled Passenger Air Transportation	481111	1,500		**	**	**	*, **	*, **	*, **	*, **
Commercial	Line-Haul Railroads	482111	1,500		*, **	*, **	*, **	*, **	*, **	*, **	*, **
Energy	Pipeline Transportation of Crude Oil	486110	1,500		**	**	**	*, **	*, **	*, **	*, **
Energy	Pipeline Transportation of Natural Gas	486210	\$27.5 million	27,963	0.24%	0.56%	0.08%	*	*	*	*
Energy	Pipeline Transportation of Refined Petroleum Products	486910	1,500		**	**	*, **	*, **	*, **	*, **	*, **
Commercial	Support Activities for Rail Transportation	488210	\$15 million	15,247	0.37%	1.32%	0.21%	*	*	*	*
Commercial	Marine Cargo Handling	488320	\$38.5 million		**	**	**	*, **	*, **	*, **	*, **
Commercial	General Warehousing and Storage	493110	\$27.5 million	24,809	1.34%	2.75%	0.84%	*	*	*	*
Commercial	Other Warehousing and Storage	493190	\$27.5 million	23,798	0.92%	3.35%	0.66%	*	*	*	*
Commercial	Lessors of Nonresidential Buildings (except Miniwarehouses)	531120	\$27.5 million		**	**	**	*, **	*, **	*, **	*, **
Commercial	Testing Laboratories	541380	\$15 million		**	**	**	*, **	*, **	*, **	*, **
Commercial	Research and Development in the Physical, Engineering and Life Sciences (except Nanotechnology and Biotechnology)^^	541715	1,000		*, **	*, **	*, **	*, **	*, **	*, **	*, **
Commercial	All Other Support Services	561990	\$11 million		**	**	**	*, **	*, **	*, **	*, **
Waste Treatment	Hazardous Waste Treatment and Disposal	562211	\$38.5 million	89,681	1.05%	5.05%	0.75%	*	*	*	*
Waste Treatment	Solid Waste Landfill	562212	\$38.5 million	23,798	0.55%	1.06%	0.17%	*	*	*	*
Waste Treatment	Solid Waste Combustors and Incinerators	562213	\$38.5 million	15,247	0.06%	*	0.04%	*	*	*	*
Waste Treatment	Remediation Services	562910	\$20.5 million		**	**	**	*, **	*, **	*, **	*, **
Educational Services	Colleges, Universities, and Professional Schools	611310	\$27.5 million	43,544	*	*	*	*	*	*	*
Commercial	Amusement and Theme Parks	713110	\$38.5 million		**	**	**	*, **	*, **	*, **	*, **

(continued)

Table 6-7. Avoided Cost to Sales in Year 5 under ALTERNATIVE SCENARIO 1 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Commercial	Linen and Uniform Supply	812330	#N/A		*, **	*, **	*, **	*, **	*, **	*, **	*, **
Commercial	Industrial Launderers	812332	\$38.5 million	15,247	0.26%	0.98%	0.24%	*	*	*	*

Notes:

Blanks in “Average Avoided Cost/Entity” column are for NAICS where zero facilities are eligible to obtain area source status. NA means it is not a valid 2012 NAICS code, thus an SBA Size Standard is not available.

*No receipts data available from Census; cost-to-sales ratios cannot be calculated.

**Zero facilities estimated to obtain area source status and no estimated net costs (savings); cost-to-sales ratios cannot be calculated.

*,**Denotes a data status as a combination of footnotes * and **.

Sources: 2012 Economic Census, 2012 County Business Patterns, 2017 SBA Size Standards, Federal Reserve Bank of St. Louis Economic Research, Eastern Research Group. August 2020a. ERG MM2A Database Memorandum, Analytical Evaluations & Summary of Industries Potentially Impacted by the Final Rule “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD; Eastern Research Group. August b. ERG MM2A Cost Analysis Memorandum, Compliance cost savings analysis for the final rulemaking “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD.SBA February 2016 Size Standards, SBA 2007 Size Standards.

6.5 Implementing the Sales Test to Measure Impacts on Industrial, Commercial and Other Sources under Alternative Scenario 2

For alternative scenario 2, the year 1 cost-to-sales ratios are reported in Table 6-8, and the year 5 avoided cost-to-sales ratios are reported in Table 6-9. The year 1 avoided cost-to-sales ratios range from -0.19 percent to less than 0.01 percent, with a median avoided cost-to-sales ratio of less than 0.01 percent across all employment size categories. The twenty-fifth percentile and seventy-fifth percentile avoided cost-to-sales ratio in year 1 are -0.01 percent and less than 0.01 percent respectively across all employment size categories. The year 5 avoided cost-to-sales ratios range from less than 0.01 percent to 5.75 percent, with a median avoided cost-to-sales ratio of 0.06 percent across all employment size categories. The twenty-fifth percentile and seventy-fifth percentile avoided cost-to-sales ratio in year 5 are 0.02 percent and 0.18 percent, respectively, across all employment size categories.

Because facilities that may reclassify would not face permitting costs in year 5 and all reclassifications would be expected to have occurred by year 5, the cost savings are generally larger and the resulting avoided cost-to-sales ratios are larger in year 5 than year 1. For example, NAICS 562211 (Hazardous Waste Treatment and Disposal) has an overall year 1 avoided cost-to-sales ratio of -0.01 percent and an overall year 5 avoided cost-to-sales ratio of 1.04 percent. Some other NAICS codes that have negative ratios in year 1 have positive ratios in year 5, such as NAICS 326191 (Plastics Plumbing Fixture Manufacturing), which has an overall avoided cost-to-sales ratio of -0.01 percent in year 1 and 0.29 percent in year 5.

Like for the primary scenario and alternative scenario 1, we conducted a small entity analysis for both year 1 and year 5 impact estimates for alternative scenario 2. In year 1, small size categories have negative avoided cost-to-sales ratios. For instance, NAICS 488210 (Support Activities for Rail Transportation) has an avoided cost-to-sales of less than -0.09 percent for the “fewer than or equal to 19 employees” category and -0.01 percent for the “20 to 99 employees” category in year 1. However, there are cases of larger positive economic impacts for small size categories in year 5. NAICS 332812 (Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers) has a year 5 “fewer than or equal to 19 employees” category avoided cost-to-sales ratio of 5.75 percent, and NAICS 493110 (General Warehousing and Storage) has a year 5 avoided cost-to-sales ratio of 2.75 percent for the same size category. As explained before, establishments in the size category “fewer than or equal to 19 employees” for NAICS 493110 are considered small businesses for purposes of this analysis based on the SBA size standard for this NAICS code.

Table 6-8. Avoided Cost to Sales in Year 1 under ALTERNATIVE SCENARIO 2

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Agriculture	Postharvest Crop Activities (except Cotton Ginning)	115114	\$27.5 million		*, **	*, **	*, **	*, **	*, **	*, **	*, **
Energy	Crude Petroleum and Natural Gas Extraction	211111	1250 (Feb 2016 Size Standards)	-\$1,022	0.00%	*	0.00%	0.00%	0.00%	0.00%	*
Energy	Natural Gas Liquid Extraction	211112	750 (Feb 2016 Size Standards)	-\$1,022	0.00%	0.00%	0.00%	0.00%	0.00%	*	*
Industrial	Iron Ore Mining	212210	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Lead Ore and Zinc Ore Mining	212231	750 (Feb 2016 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Copper Ore and Nickel Ore Mining	212234	1500 (Feb 2016 Size Standards)		**	*, **	*, **	*, **	**	*, **	*, **
Industrial	All Other Metal Ore Mining	212299	750		**	*, **	*, **	**	*, **	*, **	*, **
Industrial	Industrial Sand Mining	212322	500		**	**	**	**	*, **	*, **	*, **
Industrial	Kaolin and Ball Clay Mining	212324	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Potash, Soda, and Borate Mineral Mining	212391	750		**	*, **	*, **	*, **	**	*, **	*, **
Industrial	All Other Nonmetallic Mineral Mining	212399	500		**	*, **	**	*, **	*, **	*, **	*, **
Energy	Support Activities for Oil and Gas Operations	213112	\$38.5 million	-\$1,022	-0.01%	-0.05%	-0.01%	0.00%	0.00%	0.00%	*
Utilities	Hydroelectric Power Generation	221111	500	-\$1,022	-0.02%	*	*	*	*	*	*
Utilities	Fossil Fuel Electric Power Generation	221112	750	-\$1,022	0.00%	*	*	*	*	*	*
Utilities	Biomass Electric Power Generation	221117	250	-\$1,022	-0.01%	*	*	*	*	*	*
Utilities	Other Electric Power Generation	221118	250	-\$1,022	-0.04%	*	*	*	*	*	*
Utilities	Other Electric Power Generation^	221119	4 million MWH (2007 Size Standards)	-\$1,022	-0.01%	*	*	*	*	*	*
Utilities	Electric Power Distribution	221122	1,000	-\$1,022	0.00%	*	*	*	*	*	*
Utilities	Natural Gas Distribution	221210	1,000	-\$1,022	0.00%	*	*	*	*	*	*
Utilities	Water Supply and Irrigation Systems	221310	\$27.5 million	-\$1,022	-0.04%	*	*	*	*	*	*
Utilities	Sewage Treatment Facilities	221320	\$20.5 million	-\$1,022	-0.05%	*	*	*	*	*	*
Utilities	Steam and Air-Conditioning Supply	221330	\$15 million	-\$1,022	-0.01%	*	*	*	*	*	*
Industrial	Other Animal Food Manufacturing	311119	500		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Wet Corn Milling	311221	1,250		**	*, **	**	**	*, **	*, **	*, **
Industrial	Soybean Processing^	311222	500 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Other Oilseed Processing^	311223	1000 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Soybean and Other Oilseed Processing	311224	1,000	-\$1,022	0.00%	*	0.00%	*	*	*	*
Industrial	Fats and Oils Refining and Blending	311225	1,000		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Beet Sugar Manufacturing	311313	750		**	*, **	*, **	*, **	**	*, **	*, **

(continued)

Table 6-8. Avoided Cost to Sales in Year 1 under ALTERNATIVE SCENARIO 2 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Cane Sugar Manufacturing	311314	1,000		**	, **	, **	**	, **	, **	, **
Industrial	Frozen Fruit, Juice, and Vegetable Manufacturing	311411	1,000		**	, **	, **	**	, **	, **	, **
Industrial	Fruit and Vegetable Canning	311421	1,000		**	, **	**	**	, **	, **	, **
Industrial	Specialty Canning	311422	1,250		**	, **	, **	, **	**	, **	, **
Industrial	Cheese Manufacturing	311513	1,250		**	**	**	**	**	**	, **
Industrial	Dry, Condensed, and Evaporated Dairy Product Manufacturing	311514	750		**	, **	**	**	, **	, **	, **
Industrial	Rendering and Meat Byproduct Processing	311613	750		**	, **	**	**	, **	, **	, **
Industrial	Commercial Bakeries	311812	1,000		**	, **	**	**	**	, **	, **
Industrial	Other Snack Food Manufacturing	311919	1,250		**	, **	**	**	, **	, **	, **
Industrial	Coffee and Tea Manufacturing	311920	750		**	, **	**	**	, **	, **	, **
Industrial	Flavoring Syrup and Concentrate Manufacturing	311930	1,000		**	, **	, **	**	, **	, **	, **
Industrial	Spice and Extract Manufacturing	311942	500		**	, **	**	**	, **	, **	, **
Industrial	All Other Miscellaneous Food Manufacturing	311999	500		**	, **	**	**	**	, **	, **
Industrial	Breweries	312120	1,250	-\$1,022	0.00%	*	-0.01%	*	*	*	*
Industrial	Distilleries	312140	1,000		**	, **	, **	, **	, **	, **	, **
Industrial	Tobacco Manufacturing	312230	1,500		**	, **	, **	**	**	, **	, **
Industrial	Yarn Spinning Mills^	313111	500 (2007 Size Standards)	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Thread Mills^	313113	500 (2007 Size Standards)	-\$1,022	-0.02%	*	*	*	*	*	*
Industrial	Broadwoven Fabric Mills	313210	1,000	-\$1,022	-0.01%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Narrow Fabric Mills^	313221	500 (2007 Size Standards)	-\$1,022	-0.01%	*	*	*	*	*	*
Industrial	Textile and Fabric Finishing Mills	313310	1,000	-\$1,022	-0.02%	*	-0.01%	0.00%	*	*	*
Industrial	Broadwoven Fabric Finishing Mills^	313311	1000 (2007 Size Standards)	-\$1,022	-0.01%	*	*	*	*	*	*
Industrial	Fabric Coating Mills	313320	1,000	-\$1,022	-0.01%	*	-0.01%	*	*	*	*
Industrial	Tire Cord and Tire Fabric Mills^	314992	1000 (2007 Size Standards)		**	, **	, **	, **	, **	, **	, **
Industrial	Leather and Hide Tanning and Finishing	316110	500	-\$1,022	-0.01%	*	0.00%	0.00%	*	*	*
Industrial	Sawmills	321113	500	-\$1,022	-0.01%	-0.07%	-0.01%	0.00%	*	*	*
Industrial	Wood Preservation	321114	500	-\$1,022	-0.01%	*	0.00%	*	*	*	*
Industrial	Hardwood Veneer and Plywood Manufacturing	321211	500	-\$1,022	-0.01%	*	*	0.00%	*	*	*
Industrial	Softwood Veneer and Plywood Manufacturing	321212	1,250	-\$1,022	0.00%	*	*	0.00%	0.00%	*	*
Industrial	Engineered Wood Member (except Truss) Manufacturing	321213	750	-\$1,022	-0.01%	*	*	0.00%	*	*	*
Industrial	Reconstituted Wood Product Manufacturing	321219	750	-\$1,022	0.00%	*	*	0.00%	*	*	*

(continued)

Table 6-8. Avoided Cost to Sales in Year 1 under ALTERNATIVE SCENARIO 2 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Wood Window and Door Manufacturing	321911	1,000	-\$1,022	-0.01%	*	*	0.00%	*	*	*
Industrial	Cut Stock, Resawing Lumber, and Planing	321912	500	-\$1,022	-0.02%	-0.07%	-0.01%	*	*	*	*
Industrial	All Other Miscellaneous Wood Product Manufacturing	321999	500	-\$1,022	-0.03%	-0.11%	-0.01%	0.00%	*	*	*
Industrial	Pulp Mills	322110	750	-\$1,022	0.00%	*	*	0.00%	0.00%	*	*
Industrial	Paper (except Newsprint) Mills	322121	1,250	-\$1,022	0.00%	*	*	0.00%	0.00%	0.00%	*
Industrial	Newsprint Mills	322122	750	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Paperboard Mills	322130	1,250	-\$1,022	0.00%	*	*	0.00%	0.00%	*	*
Industrial	Corrugated and Solid Fiber Box Manufacturing	322211	1,250	-\$1,022	0.00%	-0.03%	0.00%	0.00%	*	*	*
Industrial	Paper Bag and Coated and Treated Paper Manufacturing	322220	750	-\$1,022	0.00%	*	0.00%	0.00%	0.00%	*	*
Industrial	Coated and Laminated Paper Manufacturing^	322222	500 (2007 Size Standards)	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Sanitary Paper Product Manufacturing	322291	1,500		**	*, **	*, **	**	**	*, **	*, **
Industrial	All Other Converted Paper Product Manufacturing	322299	500		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Commercial Lithographic Printing^	323110	500 (2007 Size Standards)	-\$1,022	-0.03%	*	*	*	*	*	*
Industrial	Commercial Printing (except Screen and Books)	323111	500	-\$1,022	-0.03%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Books Printing	323117	1,250	-\$1,022	-0.01%	*	*	0.00%	0.00%	*	*
Industrial	Petroleum Refineries	324110	1,500	-\$1,030	0.00%	*	0.00%	0.00%	*	0.00%	*
Industrial	Asphalt Shingle and Coating Materials Manufacturing	324122	750		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	All Other Petroleum and Coal Products Manufacturing	324199	500		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Petrochemical Manufacturing	325110	1,000	-\$1,021	0.00%	*	*	0.00%	*	*	*
Industrial	Industrial Gas Manufacturing	325120	1,000	-\$1,022	-0.01%	-0.01%	0.00%	*	*	*	*
Industrial	Synthetic Dye and Pigment Manufacturing	325130	1,000		**	*, **	**	**	*, **	*, **	*, **
Industrial	Inorganic Dye and Pigment Manufacturing^	325131	1000 (2007 Size Standards)	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Synthetic Organic Dye and Pigment Manufacturing^	325132	750 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Other Basic Inorganic Chemical Manufacturing	325180	1,000	-\$1,022	0.00%	*	0.00%	0.00%	0.00%	*	*
Industrial	Alkalies and Chlorine Manufacturing^	325181	1000 (2007 Size Standards)	-\$1,022	0.00%	*	*	*	*	*	*

(continued)

Table 6-8. Avoided Cost to Sales in Year 1 under ALTERNATIVE SCENARIO 2 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Carbon Black Manufacturing^	325182	500 (2007 Size Standards)	-\$1,078	0.00%	*	*	*	*	*	*
Industrial	All Other Basic Inorganic Chemical Manufacturing^	325188	1000 (2007 Size Standards)	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Cyclic Crude and Intermediate Manufacturing^	325192	750 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Ethyl Alcohol Manufacturing	325193	1,000	-\$1,022	0.00%	*	0.00%	0.00%	*	*	*
Industrial	Cyclic Crude, Intermediate, and Gum and Wood Chemical Manufacturing	325194	1,250		**	*, **	**	**	*, **	*, **	*, **
Industrial	All Other Basic Organic Chemical Manufacturing	325199	1,250	-\$1,022	0.00%	*	0.00%	0.00%	0.00%	0.00%	*
Industrial	Plastics Material and Resin Manufacturing	325211	1,250	-\$1,021	0.00%	*	0.00%	0.00%	0.00%	0.00%	*
Industrial	Synthetic Rubber Manufacturing	325212	1,000	-\$1,022	0.00%	*	0.00%	*	*	*	*
Industrial	Artificial and Synthetic Fibers and Filaments Manufacturing	325220	1,000	-\$1,022	0.00%	*	0.00%	0.00%	0.00%	*	*
Industrial	Cellulosic Organic Fiber Manufacturing^	325221	1000 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Noncellulosic Organic Fiber Manufacturing^	325222	1000 (2007 Size Standards)	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Nitrogenous Fertilizer Manufacturing	325311	1,000	-\$1,022	0.00%	*	0.00%	*	*	*	*
Industrial	Phosphatic Fertilizer Manufacturing	325312	750	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Pesticide and Other Agricultural Chemical Manufacturing	325320	1,000	-\$1,022	0.00%	*	0.00%	0.00%	*	*	*
Industrial	Medicinal and Botanical Manufacturing	325411	1,000	-\$1,022	0.00%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Pharmaceutical Preparation Manufacturing	325412	1,250	-\$1,022	0.00%	*	*	0.00%	0.00%	0.00%	*
Industrial	Biological Product (except Diagnostic) Manufacturing	325414	1,250		**	*, **	*, **	**	**	**	*, **
Industrial	Paint and Coating Manufacturing	325510	1,000	-\$1,022	0.00%	*	0.00%	0.00%	*	*	*
Industrial	Adhesive Manufacturing	325520	500	-\$1,022	0.00%	-0.02%	0.00%	0.00%	*	*	*
Industrial	Surface Active Agent Manufacturing	325613	750		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Toilet Preparation Manufacturing	325620	1,250		**	**	**	**	**	**	*, **
Industrial	Explosives Manufacturing	325920	750		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Custom Compounding of Purchased Resins	325991	500	-\$1,022	0.00%	*	0.00%	0.00%	*	*	*
Industrial	Photographic Film, Paper, Plate, and Chemical Manufacturing	325992	1,500	-\$1,022	0.00%	*	0.00%	0.00%	*	*	*

(continued)

Table 6-8. Avoided Cost to Sales in Year 1 under ALTERNATIVE SCENARIO 2 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	All Other Miscellaneous Chemical Product and Preparation Manufacturing	325998	500	-\$1,022	-0.01%	-0.03%	0.00%	0.00%	0.00%	*	*
Industrial	Plastics Packaging Film and Sheet (including Laminated) Manufacturing	326112	1,000	-\$1,022	0.00%	-0.03%	0.00%	0.00%	*	*	*
Industrial	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing	326113	750	-\$1,022	0.00%	*	0.00%	0.00%	0.00%	*	*
Industrial	Unlaminated Plastics Profile Shape Manufacturing	326121	500	-\$1,022	-0.01%	*	-0.01%	0.00%	*	*	*
Industrial	Plastics Pipe and Pipe Fitting Manufacturing	326122	750	-\$1,022	0.00%	-0.02%	0.00%	0.00%	*	*	*
Industrial	Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing	326130	500	-\$1,022	-0.01%	*	-0.01%	*	*	*	*
Industrial	Polystyrene Foam Product Manufacturing	326140	1,000	-\$1,022	0.00%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Urethane and Other Foam Product (except Polystyrene) Manufacturing	326150	750	-\$1,010	-0.01%	*	-0.01%	0.00%	*	*	*
Industrial	Plastics Plumbing Fixture Manufacturing	326191	750	-\$1,022	-0.01%	*	-0.01%	*	*	*	*
Industrial	All Other Plastics Product Manufacturing	326199	750	-\$1,022	-0.01%	-0.07%	-0.01%	0.00%	0.00%	0.00%	*
Industrial	Tire Manufacturing (except Retreading)	326211	1,500	-\$1,013	0.00%	*	*	0.00%	0.00%	0.00%	*
Industrial	Rubber and Plastics Hoses and Belting Manufacturing	326220	750	-\$1,022	0.00%	*	*	0.00%	0.00%	*	*
Industrial	Rubber Product Manufacturing for Mechanical Use	326291	750	-\$1,022	-0.01%	*	*	0.00%	0.00%	*	*
Industrial	All Other Rubber Product Manufacturing	326299	500	-\$1,022	-0.01%	-0.05%	-0.01%	0.00%	*	*	*
Industrial	Pottery, Ceramics, and Plumbing Fixture Manufacturing	327110	1,000	-\$856	-0.02%	*	-0.01%	0.00%	*	*	*
Industrial	Clay Building Material and Refractories Manufacturing	327120	750	-\$1,022	-0.01%	-0.06%	-0.01%	0.00%	*	*	*
Industrial	Clay Refractory Manufacturing^	327124	500 (2007 Size Standards)	-\$1,031	-0.01%	*	*	*	*	*	*
Industrial	Flat Glass Manufacturing	327211	1,000	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Other Pressed and Blown Glass and Glassware Manufacturing	327212	1,250	-\$1,022	-0.01%	*	*	*	0.00%	*	*
Industrial	Cement Manufacturing	327310	1,000	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Lime Manufacturing	327410	750	-\$1,022	0.00%	*	*	*	*	*	*

(continued)

Table 6-8. Avoided Cost to Sales in Year 1 under ALTERNATIVE SCENARIO 2 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20-99	100~499	500~999	1000~2499	≥2500
Industrial	Gypsum Product Manufacturing	327420	1,500	-\$1,022	-0.01%	*	0.00%	*	*	*	*
Industrial	Abrasive Product Manufacturing	327910	750	-\$1,022	-0.01%	-0.04%	-0.01%	0.00%	0.00%	*	*
Industrial	Mineral Wool Manufacturing	327993	1,500	-\$1,022	-0.01%	*	-0.01%	0.00%	*	*	*
Industrial	All Other Miscellaneous Nonmetallic Mineral Product Manufacturing	327999	500	-\$1,022	-0.01%	*	-0.01%	*	*	*	*
Industrial	Iron and Steel Mills and Ferroalloy Manufacturing	331110	1,500	-\$1,022	0.00%	*	*	0.00%	0.00%	0.00%	*
Industrial	Iron and Steel Mills^	331111	1000 (2007 Size Standards)	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Electrometallurgical Ferroalloy Product Manufacturing^	331112	750 (2007 Size Standards)		**	*,**	*,**	*,**	*,**	*,**	*,**
Industrial	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel	331210	1,000	-\$1,022	0.00%	-0.02%	0.00%	0.00%	0.00%	0.00%	*
Industrial	Rolled Steel Shape Manufacturing	331221	1,000	-\$1,022	0.00%	*	0.00%	*	*	*	*
Industrial	Primary Aluminum Production^	331312	1000 (2007 Size Standards)		**	*,**	*,**	*,**	*,**	*,**	*,**
Industrial	Alumina Refining and Primary Aluminum Production	331313	1,000	-\$1,022	0.00%	*	0.00%	0.00%	0.00%	*	*
Industrial	Secondary Smelting and Alloying of Aluminum	331314	750	-\$1,022	0.00%	*	0.00%	*	*	*	*
Industrial	Aluminum Sheet, Plate, and Foil Manufacturing	331315	1,250	-\$1,022	0.00%	*	*	0.00%	0.00%	*	*
Industrial	Aluminum Extruded Product Manufacturing^	331316	750 (2007 Size Standards)		**	*,**	*,**	*,**	*,**	*,**	*,**
Industrial	Other Aluminum Rolling, Drawing, and Extruding	331318	750		**	*,**	*,**	**	*,**	*,**	*,**
Industrial	Nonferrous Metal (except Aluminum) Smelting and Refining	331410	1,000		**	*,**	**	*,**	**	*,**	*,**
Industrial	Primary Smelting and Refining of Copper^	331411	1000 (2007 Size Standards)		**	*,**	*,**	*,**	*,**	*,**	*,**
Industrial	Primary Smelting and Refining of Nonferrous Metal (except Copper and Aluminum)^	331419	750 (2007 Size Standards)		**	*,**	*,**	*,**	*,**	*,**	*,**
Industrial	Copper Rolling, Drawing, Extruding, and Alloying	331420	1,000		**	*,**	**	**	**	*,**	*,**
Industrial	Copper Wire (except Mechanical) Drawing^	331422	1000 (2007 Size Standards)		**	*,**	*,**	*,**	*,**	*,**	*,**
Industrial	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, and Extruding	331491	750	-\$1,022	0.00%	*	0.00%	0.00%	*	*	*

(continued)

Table 6-8. Avoided Cost to Sales in Year 1 under ALTERNATIVE SCENARIO 2 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	331492	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Iron Foundries	331511	1,000	-\$1,022	0.00%	*	*	0.00%	0.00%	*	*
Industrial	Steel Foundries (except Investment)	331513	500		**	*, **	**	**	**	*, **	*, **
Industrial	Aluminum Die-Casting Foundries^	331521	500 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Aluminum Foundries (except Die-Casting)	331524	500		**	*, **	**	**	*, **	*, **	*, **
Industrial	Nonferrous Forging	332112	750	-\$1,022	0.00%	*	*	0.00%	0.00%	*	*
Industrial	Metal Crown, Closure, and Other Metal Stamping (except Automotive)	332119	500	-\$1,022	-0.01%	-0.07%	-0.01%	0.00%	0.00%	*	*
Industrial	Hand and Edge Tool Manufacturing^	332212	500 (2007 Size Standards)	-\$1,022	-0.02%	*	*	*	*	*	*
Industrial	Prefabricated Metal Building and Component Manufacturing	332311	750	-\$1,022	-0.01%	*	-0.01%	0.00%	*	*	*
Industrial	Fabricated Structural Metal Manufacturing	332312	500	-\$1,022	-0.01%	*	-0.01%	0.00%	*	*	*
Industrial	Metal Window and Door Manufacturing	332321	750	-\$1,022	-0.01%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Sheet Metal Work Manufacturing	332322	500	-\$1,022	-0.02%	-0.07%	-0.01%	0.00%	*	*	*
Industrial	Metal Can Manufacturing	332431	1,500	-\$1,022	0.00%	*	0.00%	0.00%	*	*	*
Industrial	Other Metal Container Manufacturing	332439	500	-\$1,022	-0.01%	-0.07%	-0.01%	0.00%	0.00%	*	*
Industrial	Bolt, Nut, Screw, Rivet, and Washer Manufacturing	332722	500	-\$1,022	-0.01%	-0.07%	-0.01%	0.00%	0.00%	*	*
Industrial	Metal Heat Treating	332811	750	-\$1,022	-0.01%	*	-0.01%	*	*	*	*
Industrial	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers	332812	500	-\$1,022	-0.02%	-0.12%	-0.01%	0.00%	*	*	*
Industrial	Electroplating, Plating, Polishing, Anodizing, and Coloring	332813	500	-\$1,022	-0.03%	-0.12%	-0.02%	*	*	*	*
Industrial	Other Fabricated Metal Manufacturing	332990	#N/A	-\$1,022	*	*	*	*	*	*	*
Industrial	Small Arms Ammunition Manufacturing	332992	1,250	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Ammunition (except Small Arms) Manufacturing	332993	1,500	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	All Other Miscellaneous Fabricated Metal Product Manufacturing	332999	750	-\$1,022	-0.02%	-0.11%	-0.01%	0.00%	0.00%	*	*
Industrial	Farm Machinery and Equipment Manufacturing	333111	1,250	-\$1,022	0.00%	*	-0.01%	0.00%	0.00%	0.00%	*

(continued)

Table 6-8. Avoided Cost to Sales in Year 1 under ALTERNATIVE SCENARIO 2 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Lawn and Garden Tractor and Home Lawn and Garden Equipment Manufacturing	333112	1,500		**	*, **	*, **	**	**	*, **	*, **
Industrial	Construction Machinery Manufacturing	333120	1,250	-\$1,022	0.00%	*	-0.01%	0.00%	0.00%	0.00%	*
Industrial	Mining Machinery and Equipment Manufacturing	333131	500		**	*, **	**	**	*, **	*, **	*, **
Industrial	Printing Machinery and Equipment Manufacturing^	333293	500 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Photographic and Photocopying Equipment Manufacturing	333316	1,000		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing	333415	1,250		**	**	**	**	**	**	*, **
Industrial	Machine Tool (Metal Cutting Types) Manufacturing^	333512	500 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Machine Tool (Metal Forming Types) Manufacturing^	333513	500 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Turbine and Turbine Generator Set Units Manufacturing	333611	1,500		**	*, **	*, **	**	**	**	*, **
Industrial	Other Engine Equipment Manufacturing	333618	1,500	-\$1,022	0.00%	-0.04%	0.00%	0.00%	0.00%	0.00%	*
Industrial	Overhead Traveling Crane, Hoist, and Monorail System Manufacturing	333923	1,250		**	*, **	**	**	*, **	*, **	*, **
Industrial	Welding and Soldering Equipment Manufacturing	333992	1,250		**	**	**	**	*, **	**	*, **
Industrial	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	334220	1,250		**	**	**	**	**	**	**
Industrial	Electron Tube Manufacturing^	334411	750 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Bare Printed Circuit Board Manufacturing	334412	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Semiconductor and Related Device Manufacturing	334413	1,250	-\$1,021	0.00%	*	0.00%	0.00%	0.00%	0.00%	*
Industrial	Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use	334512	500		**	*, **	**	*, **	**	*, **	*, **
Industrial	Blank Magnetic and Optical Recording Media Manufacturing	334613	1,000		**	*, **	*, **	*, **	*, **	*, **	*, **

(continued)

Table 6-8. Avoided Cost to Sales in Year 1 under ALTERNATIVE SCENARIO 2 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Electric Lamp Bulb and Part Manufacturing	335110	1,250	-\$1,022	0.00%	*	*	0.00%	*	*	*
Industrial	Household Laundry Equipment Manufacturing	335224	1,250	-\$1,022	*	*	*	*	*	*	*
Industrial	Other Major Household Appliance Manufacturing	335228	1,000	-\$1,022	0.00%	*	*	*	0.00%	*	*
Industrial	Power, Distribution, and Specialty Transformer Manufacturing	335311	750	-\$1,022	0.00%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Motor and Generator Manufacturing	335312	1,250	-\$1,022	0.00%	*	-0.01%	0.00%	*	*	*
Industrial	Storage Battery Manufacturing	335911	1,250	-\$1,022	0.00%	*	*	0.00%	0.00%	*	*
Industrial	Current-Carrying Wiring Device Manufacturing	335931	500	-\$1,022	-0.01%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Noncurrent-Carrying Wiring Device Manufacturing	335932	1,000	-\$1,022	0.00%	*	0.00%	0.00%	*	*	*
Industrial	Carbon and Graphite Product Manufacturing	335991	750	-\$1,022	0.00%	*	-0.01%	0.00%	*	*	*
Industrial	Automobile Manufacturing	336111	1,500	-\$1,022	0.00%	*	*	*	*	0.00%	0.00%
Industrial	Light Truck and Utility Vehicle Manufacturing	336112	1,500	-\$1,022	0.00%	*	*	0.00%	*	*	0.00%
Industrial	Heavy Duty Truck Manufacturing	336120	1,500	-\$1,022	0.00%	*	*	*	0.00%	0.00%	*
Industrial	Motor Vehicle Body Manufacturing	336211	1,000	-\$1,022	-0.01%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Truck Trailer Manufacturing	336212	1,000	-\$1,022	0.00%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Motor Vehicle Gasoline Engine and Engine Parts Manufacturing	336310	1,000	-\$1,022	0.00%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Carburetor, Piston, Piston Ring, and Valve Manufacturing^	336311	500 (2007 Size Standards)	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Gasoline Engine and Engine Parts Manufacturing^	336312	750 (2007 Size Standards)	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing	336330	1,000	-\$1,022	0.00%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Motor Vehicle Brake System Manufacturing	336340	1,250	-\$1,022	0.00%	*	0.00%	0.00%	0.00%	*	*
Industrial	Motor Vehicle Transmission and Power Train Parts Manufacturing	336350	1,500	-\$1,022	0.00%	*	0.00%	0.00%	0.00%	0.00%	*
Industrial	Motor Vehicle Seating and Interior Trim Manufacturing	336360	1,500	-\$1,022	0.00%	*	0.00%	0.00%	0.00%	*	*
Industrial	Motor Vehicle Metal Stamping	336370	1,000	-\$1,022	0.00%	-0.05%	-0.01%	0.00%	0.00%	0.00%	*
Industrial	Other Motor Vehicle Parts Manufacturing	336390	1,000	-\$1,022	0.00%	-0.04%	0.00%	0.00%	0.00%	0.00%	*

(continued)

Table 6-8. Avoided Cost to Sales in Year 1 under ALTERNATIVE SCENARIO 2 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	All Other Motor Vehicle Parts Manufacturing^	336399	750 (2007 Size Standards)	-\$1,022	0.00%	*	*	*	*	*	*
Industrial	Aircraft Manufacturing	336411	1,500	-\$1,022	0.00%	*	-0.01%	0.00%	0.00%	0.00%	0.00%
Industrial	Aircraft Engine and Engine Parts Manufacturing	336412	1,500	-\$1,022	0.00%	-0.05%	-0.01%	0.00%	0.00%	0.00%	0.00%
Industrial	Other Aircraft Parts and Auxiliary Equipment Manufacturing	336413	1,250	-\$1,022	0.00%	*	-0.01%	0.00%	0.00%	*	0.00%
Industrial	Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing	336415	1,250	-\$1,022	0.00%	*	*	*	*	0.00%	*
Industrial	Railroad Rolling Stock Manufacturing	336510	1,500	-\$1,022	0.00%	*	0.00%	0.00%	0.00%	*	*
Industrial	Ship Building and Repairing	336611	1,250	-\$1,022	0.00%	-0.07%	-0.01%	0.00%	0.00%	0.00%	0.00%
Industrial	Boat Building	336612	1,000	-\$1,022	-0.01%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Military Armored Vehicle, Tank, and Tank Component Manufacturing	336992	1,500	-\$1,022	0.00%	*	*	0.00%	*	*	*
Industrial	Wood Kitchen Cabinet and Countertop Manufacturing	337110	750	-\$1,022	-0.06%	*	*	0.00%	0.00%	*	*
Industrial	Upholstered Household Furniture Manufacturing	337121	1,000	-\$1,022	-0.01%	*	*	0.00%	0.00%	*	*
Industrial	Nonupholstered Wood Household Furniture Manufacturing	337122	750	-\$1,022	-0.06%	*	-0.02%	0.00%	*	*	*
Industrial	Institutional Furniture Manufacturing	337127	500	-\$1,022	-0.01%	*	-0.01%	0.00%	*	*	*
Industrial	Wood Office Furniture Manufacturing	337211	1,000	-\$1,022	-0.01%	*	-0.01%	0.00%	*	*	*
Industrial	Office Furniture (except Wood) Manufacturing	337214	1,000	-\$1,022	0.00%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Showcase, Partition, Shelving, and Locker Manufacturing	337215	500	-\$1,022	-0.02%	*	-0.01%	0.00%	0.00%	*	*
Industrial	Blind and Shade Manufacturing	337920	1,000	-\$1,022	-0.02%	*	-0.01%	0.00%	*	*	*
Industrial	Surgical and Medical Instrument Manufacturing	339112	1,000		**	*, **	*, **	**	**	**	*, **
Industrial	Surgical Appliance and Supplies Manufacturing	339113	750		**	*, **	*, **	**	**	**	*, **
Industrial	Jewelry and Silverware Manufacturing	339910	500		**	**	**	*, **	*, **	*, **	*, **
Industrial	Sporting and Athletic Goods Manufacturing	339920	750		**	**	**	**	**	**	*, **
Industrial	Office Supplies (except Paper) Manufacturing	339940	750		**	*, **	**	**	*, **	*, **	*, **

(continued)

Table 6-8. Avoided Cost to Sales in Year 1 under ALTERNATIVE SCENARIO 2 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Gasket, Packing, and Sealing Device Manufacturing	339991	500		**	*, **	**	**	**	*, **	*, **
Industrial	Burial Casket Manufacturing	339995	1,000	-\$1,022	-0.01%	*	*	*	*	*	*
Industrial	All Other Miscellaneous Manufacturing	339999	500	-\$1,022	-0.05%	-0.19%	-0.01%	0.00%	*	*	*
Commercial	Grain and Field Bean Merchant Wholesalers	424510	200		**	**	**	*, **	*, **	*, **	*, **
Commercial	Petroleum Bulk Stations and Terminals	424710	200	-\$1,022	0.00%	0.00%	0.00%	*	*	*	*
Commercial	Scheduled Passenger Air Transportation	481111	1,500		**	**	**	*, **	*, **	*, **	*, **
Commercial	Line-Haul Railroads	482111	1,500		*, **	*, **	*, **	*, **	*, **	*, **	*, **
Energy	Pipeline Transportation of Crude Oil	486110	1,500		**	**	**	*, **	*, **	*, **	*, **
Energy	Pipeline Transportation of Natural Gas	486210	\$27.5 million	-\$1,022	-0.01%	-0.02%	0.00%	*	*	*	*
Energy	Pipeline Transportation of Refined Petroleum Products	486910	1,500		**	**	*, **	*, **	*, **	*, **	*, **
Commercial	Support Activities for Rail Transportation	488210	\$15 million	-\$1,022	-0.03%	-0.09%	-0.01%	*	*	*	*
Commercial	Marine Cargo Handling	488320	\$38.5 million		**	**	**	*, **	*, **	*, **	*, **
Commercial	General Warehousing and Storage	493110	\$27.5 million	-\$1,022	-0.06%	-0.11%	-0.03%	*	*	*	*
Commercial	Other Warehousing and Storage	493190	\$27.5 million	-\$1,022	-0.04%	-0.14%	-0.03%	*	*	*	*
Commercial	Lessors of Nonresidential Buildings (except Miniwarehouses)	531120	\$27.5 million		**	**	**	*, **	*, **	*, **	*, **
Commercial	Testing Laboratories	541380	\$15 million		**	**	**	*, **	*, **	*, **	*, **
Commercial	Research and Development in the Physical, Engineering and Life Sciences (except Nanotechnology and Biotechnology)^	541715	1,000		*, **	*, **	*, **	*, **	*, **	*, **	*, **
Commercial	All Other Support Services	561990	\$11 million		**	**	**	*, **	*, **	*, **	*, **
Waste Treatment	Hazardous Waste Treatment and Disposal	562211	\$38.5 million	-\$1,022	-0.01%	-0.06%	-0.01%	*	*	*	*
Waste Treatment	Solid Waste Landfill	562212	\$38.5 million	-\$1,022	-0.02%	-0.05%	-0.01%	*	*	*	*
Waste Treatment	Solid Waste Combustors and Incinerators	562213	\$38.5 million	-\$1,022	0.00%	*	0.00%	*	*	*	*
Waste Treatment	Remediation Services	562910	\$20.5 million	-\$1,022	-0.03%	-0.09%	-0.01%	*	*	*	*
Educational Services	Colleges, Universities, and Professional Schools	611310	\$27.5 million	-\$1,022	*	*	*	*	*	*	*
Commercial	Amusement and Theme Parks	713110	\$38.5 million		**	**	**	*, **	*, **	*, **	*, **

(continued)

Table 6-8. Avoided Cost to Sales in Year 1 under ALTERNATIVE SCENARIO 2 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Commercial	Linen and Uniform Supply	812330	#N/A		, **	, **	, **	, **	, **	, **	, **
Commercial	Industrial Launderers	812332	\$38.5 million	-\$1,022	-0.02%	-0.07%	-0.02%	*	*	*	*

Notes:

Blanks in “Average Avoided Cost/Entity” column are for NAICS where zero facilities are eligible to obtain area source status. NA means it is not a valid 2012 NAICS code, thus an SBA Size Standard is not available.

*No receipts data available from Census; cost-to-sales ratios cannot be calculated.

For assessed Source Category "Pulp & Paper (non-combust) MACT" (NAICS 322121), assessed using an extrapolated approach, one facility is extrapolated to obtain area source status. However, in the estimation of Extrapolated Costs (Savings) "No facilities are expected to be area sources" and therefore these costs (savings) are estimated as zero. We make the same assumption for this category in our calculation of Extrapolated Costs (Savings) in Year 1 without state permitting costs.

**Zero facilities Estimated to obtain area source status and no Estimated net costs (savings); cost-to-sales ratios cannot be calculated.

*,**Denotes a data status as a combination of footnotes * and **

Sources: 2012 Economic Census, 2012 County Business Patterns, 2017 SBA Size Standards, Federal Reserve Bank of St. Louis Economic Research, Eastern Research Group. August 2020. ERG MM2A Database Memorandum, Analytical Evaluations & Summary of Industries Potentially Impacted by the Final Rule “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD; Eastern Research Group. August 2020. ERG MM2A Cost Analysis Memorandum, Compliance cost savings analysis for the final rulemaking “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD. August 2020.7-18, SBA February 2016 Size Standards, SBA 2007 Size Standards.

Table 6-9. Avoided Cost to Sales in Year 5 under ALTERNATIVE SCENARIO 2

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20-99	100~499	500~999	1000~2499	≥2500
Agriculture	Postharvest Crop Activities (except Cotton Ginning)	115114	\$27.5 million		*, **	*, **	*, **	*, **	*, **	*, **	*, **
Energy	Crude Petroleum and Natural Gas Extraction	211111	1250 (Feb 2016 Size Standards)	9,397	0.02%	*	0.01%	0.00%	0.00%	0.00%	*
Energy	Natural Gas Liquid Extraction	211112	750 (Feb 2016 Size Standards)	35,537	0.03%	0.06%	0.02%	0.01%	0.00%	*	*
Industrial	Iron Ore Mining	212210	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Lead Ore and Zinc Ore Mining	212231	750 (Feb 2016 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Copper Ore and Nickel Ore Mining	212234	1500 (Feb 2016 Size Standards)		**	*, **	*, **	*, **	**	*, **	*, **
Industrial	All Other Metal Ore Mining	212299	750		**	*, **	*, **	**	*, **	*, **	*, **
Industrial	Industrial Sand Mining	212322	500		**	**	**	**	*, **	*, **	*, **
Industrial	Kaolin and Ball Clay Mining	212324	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Potash, Soda, and Borate Mineral Mining	212391	750		**	*, **	*, **	*, **	**	*, **	*, **
Industrial	All Other Nonmetallic Mineral Mining	212399	500		**	*, **	**	*, **	*, **	*, **	*, **
Energy	Support Activities for Oil and Gas Operations	213112	\$38.5 million	15,247	0.16%	0.69%	0.16%	0.03%	0.01%	0.00%	*
Utilities	Hydroelectric Power Generation	221111	500	15,247	0.23%	*	*	*	*	*	*
Utilities	Fossil Fuel Electric Power Generation	221112	750	40,186	0.06%	*	*	*	*	*	*
Utilities	Biomass Electric Power Generation	221117	250	63,290	0.87%	*	*	*	*	*	*
Utilities	Other Electric Power Generation	221118	250	15,247	0.59%	*	*	*	*	*	*
Utilities	Other Electric Power Generation^	221119	4 million MWH (2007 Size Standards)	50,126	0.46%	*	*	*	*	*	*
Utilities	Electric Power Distribution	221122	1,000	15,247	0.03%	*	*	*	*	*	*
Utilities	Natural Gas Distribution	221210	1,000	40,400	0.10%	*	*	*	*	*	*
Utilities	Water Supply and Irrigation Systems	221310	\$27.5 million	23,798	0.94%	*	*	*	*	*	*
Utilities	Sewage Treatment Facilities	221320	\$20.5 million	22,367	1.07%	*	*	*	*	*	*
Utilities	Steam and Air-Conditioning Supply	221330	\$15 million	32,701	0.20%	*	*	*	*	*	*
Industrial	Other Animal Food Manufacturing	311119	500		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Wet Corn Milling	311221	1,250		**	*, **	**	**	*, **	*, **	*, **
Industrial	Soybean Processing^	311222	500 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Other Oilseed Processing^	311223	1000 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Soybean and Other Oilseed Processing	311224	1,000	35,287	0.01%	*	0.01%	*	*	*	*
Industrial	Fats and Oils Refining and Blending	311225	1,000		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Beet Sugar Manufacturing	311313	750		**	*, **	*, **	*, **	**	*, **	*, **

(continued)

Table 6-9. Avoided Cost to Sales in Year 5 under ALTERNATIVE SCENARIO 2 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20-99	100~499	500~999	1000~2499	≥2500
Industrial	Cane Sugar Manufacturing	311314	1,000		**	, **	, **	**	, **	, **	, **
Industrial	Frozen Fruit, Juice, and Vegetable Manufacturing	311411	1,000		**	, **	, **	**	, **	, **	, **
Industrial	Fruit and Vegetable Canning	311421	1,000		**	, **	**	**	, **	, **	, **
Industrial	Specialty Canning	311422	1,250		**	, **	, **	, **	**	, **	, **
Industrial	Cheese Manufacturing	311513	1,250		**	**	**	**	**	**	, **
Industrial	Dry, Condensed, and Evaporated Dairy Product Manufacturing	311514	750		**	, **	**	**	, **	, **	, **
Industrial	Rendering and Meat Byproduct Processing	311613	750		**	, **	**	**	, **	, **	, **
Industrial	Commercial Bakeries	311812	1,000		**	, **	**	**	**	, **	, **
Industrial	Other Snack Food Manufacturing	311919	1,250		**	, **	**	**	, **	, **	, **
Industrial	Coffee and Tea Manufacturing	311920	750		**	, **	**	**	, **	, **	, **
Industrial	Flavoring Syrup and Concentrate Manufacturing	311930	1,000		**	, **	, **	**	, **	, **	, **
Industrial	Spice and Extract Manufacturing	311942	500		**	, **	**	**	, **	, **	, **
Industrial	All Other Miscellaneous Food Manufacturing	311999	500		**	, **	**	**	**	, **	, **
Industrial	Breweries	312120	1,250	15,247	0.04%	*	0.10%	*	*	*	*
Industrial	Distilleries	312140	1,000		**	, **	, **	, **	, **	, **	, **
Industrial	Tobacco Manufacturing	312230	1,500		**	, **	, **	**	**	, **	, **
Industrial	Yarn Spinning Mills^	313111	500 (2007 Size Standards)	15,247	0.06%	*	*	*	*	*	*
Industrial	Thread Mills^	313113	500 (2007 Size Standards)	15,247	0.23%	*	*	*	*	*	*
Industrial	Broadwoven Fabric Mills	313210	1,000	23,798	0.17%	*	0.19%	0.04%	0.02%	*	*
Industrial	Narrow Fabric Mills^	313221	500 (2007 Size Standards)	15,247	0.22%	*	*	*	*	*	*
Industrial	Textile and Fabric Finishing Mills	313310	1,000	15,247	0.24%	*	0.12%	0.03%	*	*	*
Industrial	Broadwoven Fabric Finishing Mills^	313311	1000 (2007 Size Standards)	23,798	0.33%	*	*	*	*	*	*
Industrial	Fabric Coating Mills	313320	1,000	19,266	0.14%	*	0.10%	*	*	*	*
Industrial	Tire Cord and Tire Fabric Mills^	314992	1000 (2007 Size Standards)		**	, **	, **	, **	, **	, **	, **
Industrial	Leather and Hide Tanning and Finishing	316110	500	10,983	0.13%	*	0.04%	0.02%	*	*	*
Industrial	Sawmills	321113	500	41,778	0.60%	2.97%	0.31%	0.08%	*	*	*
Industrial	Wood Preservation	321114	500	15,247	0.14%	*	0.06%	*	*	*	*
Industrial	Hardwood Veneer and Plywood Manufacturing	321211	500	15,247	0.13%	*	*	0.03%	*	*	*
Industrial	Softwood Veneer and Plywood Manufacturing	321212	1,250	37,382	0.08%	*	*	0.04%	0.02%	*	*
Industrial	Engineered Wood Member (except Truss) Manufacturing	321213	750	23,798	0.26%	*	*	0.03%	*	*	*

(continued)

Table 6-9. Avoided Cost to Sales in Year 5 under ALTERNATIVE SCENARIO 2 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Reconstituted Wood Product Manufacturing	321219	750	21,614	0.07%	*	*	0.02%	*	*	*
Industrial	Wood Window and Door Manufacturing	321911	1,000	15,247	0.18%	*	*	0.03%	*	*	*
Industrial	Cut Stock, Resawing Lumber, and Planing	321912	500	15,247	0.23%	0.98%	0.13%	*	*	*	*
Industrial	All Other Miscellaneous Wood Product Manufacturing	321999	500	15,247	0.49%	1.67%	0.16%	0.03%	*	*	*
Industrial	Pulp Mills	322110	750	20,948	0.01%	*	*	0.01%	0.00%	*	*
Industrial	Paper (except Newsprint) Mills	322121	1,250	12,624	0.00%	*	*	0.01%	0.00%	0.00%	*
Industrial	Newsprint Mills	322122	750	15,247	0.01%	*	*	*	*	*	*
Industrial	Paperboard Mills	322130	1,250	40,400	0.02%	*	*	0.02%	0.01%	*	*
Industrial	Corrugated and Solid Fiber Box Manufacturing	322211	1,250	958	0.00%	0.03%	0.00%	0.00%	*	*	*
Industrial	Paper Bag and Coated and Treated Paper Manufacturing	322220	750	20,948	0.07%	*	0.10%	0.03%	0.00%	*	*
Industrial	Coated and Laminated Paper Manufacturing^	322222	500 (2007 Size Standards)	23,798	0.08%	*	*	*	*	*	*
Industrial	Sanitary Paper Product Manufacturing	322291	1,500		**	*, **	*, **	**	**	*, **	*, **
Industrial	All Other Converted Paper Product Manufacturing	322299	500		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Commercial Lithographic Printing^	323110	500 (2007 Size Standards)	15,247	0.37%	*	*	*	*	*	*
Industrial	Commercial Printing (except Screen and Books)	323111	500	19,795	0.57%	*	0.23%	0.04%	0.01%	*	*
Industrial	Books Printing	323117	1,250	23,798	0.25%	*	*	0.05%	0.02%	*	*
Industrial	Petroleum Refineries	324110	1,500	96,633	0.00%	*	0.04%	0.00%	*	0.00%	*
Industrial	Asphalt Shingle and Coating Materials Manufacturing	324122	750		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	All Other Petroleum and Coal Products Manufacturing	324199	500		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Petrochemical Manufacturing	325110	1,000	20,158	0.00%	*	*	0.00%	*	*	*
Industrial	Industrial Gas Manufacturing	325120	1,000	15,247	0.09%	0.22%	0.06%	*	*	*	*
Industrial	Synthetic Dye and Pigment Manufacturing	325130	1,000		**	*, **	**	**	*, **	*, **	*, **
Industrial	Inorganic Dye and Pigment Manufacturing^	325131	1000 (2007 Size Standards)	15,247	0.02%	*	*	*	*	*	*
Industrial	Synthetic Organic Dye and Pigment Manufacturing^	325132	750 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Other Basic Inorganic Chemical Manufacturing	325180	1,000	20,948	0.04%	*	0.04%	0.01%	0.00%	*	*

(continued)

Table 6-9. Avoided Cost to Sales in Year 5 under ALTERNATIVE SCENARIO 2 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20-99	100~499	500~999	1000~2499	≥2500
Industrial	Alkalies and Chlorine Manufacturing^	325181	1000 (2007 Size Standards)	28,723	0.02%	*	*	*	*	*	*
Industrial	Carbon Black Manufacturing^	325182	500 (2007 Size Standards)	32,902	0.04%	*	*	*	*	*	*
Industrial	All Other Basic Inorganic Chemical Manufacturing^	325188	1000 (2007 Size Standards)	32,123	0.07%	*	*	*	*	*	*
Industrial	Cyclic Crude and Intermediate Manufacturing^	325192	750 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Ethyl Alcohol Manufacturing	325193	1,000	20,948	0.01%	*	0.01%	0.00%	*	*	*
Industrial	Cyclic Crude, Intermediate, and Gum and Wood Chemical Manufacturing	325194	1,250		**	*, **	**	**	*, **	*, **	*, **
Industrial	All Other Basic Organic Chemical Manufacturing	325199	1,250	53,241	0.05%	*	0.08%	0.02%	0.00%	0.00%	*
Industrial	Plastics Material and Resin Manufacturing	325211	1,250	35,086	0.04%	*	0.08%	0.01%	0.00%	0.00%	*
Industrial	Synthetic Rubber Manufacturing	325212	1,000	6,981	0.01%	*	0.01%	*	*	*	*
Industrial	Artificial and Synthetic Fibers and Filaments Manufacturing	325220	1,000	23,798	0.03%	*	0.10%	0.02%	0.00%	*	*
Industrial	Cellulosic Organic Fiber Manufacturing^	325221	1000 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Noncellulosic Organic Fiber Manufacturing^	325222	1000 (2007 Size Standards)	27,543	0.04%	*	*	*	*	*	*
Industrial	Nitrogenous Fertilizer Manufacturing	325311	1,000	50,126	0.09%	*	0.09%	*	*	*	*
Industrial	Phosphatic Fertilizer Manufacturing	325312	750	20,948	0.01%	*	*	*	*	*	*
Industrial	Pesticide and Other Agricultural Chemical Manufacturing	325320	1,000	61,830	0.08%	*	0.10%	0.02%	*	*	*
Industrial	Medicinal and Botanical Manufacturing	325411	1,000	15,247	0.05%	*	0.08%	0.02%	0.00%	*	*
Industrial	Pharmaceutical Preparation Manufacturing	325412	1,250	6,127	0.00%	*	*	0.00%	0.00%	0.00%	*
Industrial	Biological Product (except Diagnostic) Manufacturing	325414	1,250		**	*, **	*, **	**	**	**	*, **
Industrial	Paint and Coating Manufacturing	325510	1,000	132,467	0.59%	*	0.42%	0.09%	*	*	*
Industrial	Adhesive Manufacturing	325520	500	15,247	0.06%	0.35%	0.05%	0.01%	*	*	*
Industrial	Surface Active Agent Manufacturing	325613	750		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Toilet Preparation Manufacturing	325620	1,250		**	**	**	**	**	**	*, **
Industrial	Explosives Manufacturing	325920	750		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Custom Compounding of Purchased Resins	325991	500	23,798	0.10%	*	0.08%	0.02%	*	*	*

(continued)

Table 6-9. Avoided Cost to Sales in Year 5 under ALTERNATIVE SCENARIO 2 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20-99	100~499	500~999	1000~2499	≥2500
Industrial	Photographic Film, Paper, Plate, and Chemical Manufacturing	325992	1,500	15,247	0.05%	*	0.07%	0.01%	*	*	*
Industrial	All Other Miscellaneous Chemical Product and Preparation Manufacturing	325998	500	20,948	0.11%	0.64%	0.07%	0.02%	0.01%	*	*
Industrial	Plastics Packaging Film and Sheet (including Laminated) Manufacturing	326112	1,000	63,290	0.18%	1.94%	0.29%	0.08%	*	*	*
Industrial	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing	326113	750	43,544	0.14%	*	0.19%	0.04%	0.01%	*	*
Industrial	Unlaminated Plastics Profile Shape Manufacturing	326121	500	15,247	0.09%	*	0.12%	0.03%	*	*	*
Industrial	Plastics Pipe and Pipe Fitting Manufacturing	326122	750	15,247	0.07%	0.34%	0.06%	0.02%	*	*	*
Industrial	Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing	326130	500	63,290	0.40%	*	0.38%	*	*	*	*
Industrial	Polystyrene Foam Product Manufacturing	326140	1,000	15,247	0.07%	*	0.09%	0.02%	0.00%	*	*
Industrial	Urethane and Other Foam Product (except Polystyrene) Manufacturing	326150	750	14,449	0.09%	*	0.08%	0.03%	*	*	*
Industrial	Plastics Plumbing Fixture Manufacturing	326191	750	23,798	0.29%	*	0.24%	*	*	*	*
Industrial	All Other Plastics Product Manufacturing	326199	750	42,831	0.32%	2.75%	0.36%	0.08%	0.02%	0.01%	*
Industrial	Tire Manufacturing (except Retreading)	326211	1,500	36,334	0.02%	*	*	0.02%	0.01%	0.00%	*
Industrial	Rubber and Plastics Hoses and Belting Manufacturing	326220	750	63,290	0.29%	*	*	0.09%	0.04%	*	*
Industrial	Rubber Product Manufacturing for Mechanical Use	326291	750	23,798	0.13%	*	*	0.04%	0.01%	*	*
Industrial	All Other Rubber Product Manufacturing	326299	500	50,126	0.30%	2.43%	0.33%	0.07%	*	*	*
Industrial	Pottery, Ceramics, and Plumbing Fixture Manufacturing	327110	1,000	12,838	0.37%	*	0.18%	0.03%	*	*	*
Industrial	Clay Building Material and Refractories Manufacturing	327120	750	15,300	0.16%	0.91%	0.14%	0.03%	*	*	*
Industrial	Clay Refractory Manufacturing^	327124	500 (2007 Size Standards)	15,511	0.16%	*	*	*	*	*	*
Industrial	Flat Glass Manufacturing	327211	1,000	23,798	0.04%	*	*	*	*	*	*
Industrial	Other Pressed and Blown Glass and Glassware Manufacturing	327212	1,250	32,730	0.36%	*	*	*	0.02%	*	*

(continued)

Table 6-9. Avoided Cost to Sales in Year 5 under ALTERNATIVE SCENARIO 2 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Cement Manufacturing	327310	1,000	63,290	0.24%	*	*	*	*	*	*
Industrial	Lime Manufacturing	327410	750	23,798	0.09%	*	*	*	*	*	*
Industrial	Gypsum Product Manufacturing	327420	1,500	15,247	0.08%	*	0.05%	*	*	*	*
Industrial	Abrasive Product Manufacturing	327910	750	23,798	0.12%	1.02%	0.15%	0.02%	0.00%	*	*
Industrial	Mineral Wool Manufacturing	327993	1,500	53,882	0.28%	*	0.38%	0.06%	*	*	*
Industrial	All Other Miscellaneous Nonmetallic Mineral Product Manufacturing	327999	500	23,798	0.24%	*	0.15%	*	*	*	*
Industrial	Iron and Steel Mills and Ferroalloy Manufacturing	331110	1,500	35,065	0.01%	*	*	0.01%	0.00%	0.00%	*
Industrial	Iron and Steel Mills^	331111	1000 (2007 Size Standards)	20,948	0.01%	*	*	*	*	*	*
Industrial	Electrometallurgical Ferroalloy Product Manufacturing^	331112	750 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel	331210	1,000	23,798	0.03%	0.46%	0.08%	0.02%	0.01%	0.00%	*
Industrial	Rolled Steel Shape Manufacturing	331221	1,000	23,798	0.07%	*	0.06%	*	*	*	*
Industrial	Primary Aluminum Production^	331312	1000 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Alumina Refining and Primary Aluminum Production	331313	1,000	261,229	0.17%	*	0.56%	0.11%	0.05%	*	*
Industrial	Secondary Smelting and Alloying of Aluminum	331314	750	4,519	0.01%	*	0.01%	*	*	*	*
Industrial	Aluminum Sheet, Plate, and Foil Manufacturing	331315	1,250	23,798	0.01%	*	*	0.01%	0.00%	*	*
Industrial	Aluminum Extruded Product Manufacturing^	331316	750 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Other Aluminum Rolling, Drawing, and Extruding	331318	750		**	*, **	*, **	**	*, **	*, **	*, **
Industrial	Nonferrous Metal (except Aluminum) Smelting and Refining	331410	1,000		**	*, **	**	*, **	**	*, **	*, **
Industrial	Primary Smelting and Refining of Copper^	331411	1000 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Primary Smelting and Refining of Nonferrous Metal (except Copper and Aluminum)^	331419	750 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Copper Rolling, Drawing, Extruding, and Alloying	331420	1,000		**	*, **	**	**	**	*, **	*, **
Industrial	Copper Wire (except Mechanical) Drawing^	331422	1000 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **

(continued)

Table 6-9. Avoided Cost to Sales in Year 5 under ALTERNATIVE SCENARIO 2 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20-99	100~499	500~999	1000~2499	≥2500
Industrial	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, and Extruding	331491	750	15,247	0.06%	*	0.07%	0.02%	*	*	*
Industrial	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	331492	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Iron Foundries	331511	1,000	63,290	0.22%	*	*	0.10%	0.02%	*	*
Industrial	Steel Foundries (except Investment)	331513	500		**	*, **	**	**	**	*, **	*, **
Industrial	Aluminum Die-Casting Foundries^	331521	500 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Aluminum Foundries (except Die-Casting)	331524	500		**	*, **	**	**	*, **	*, **	*, **
Industrial	Nonferrous Forging	332112	750	15,247	0.03%	*	*	0.02%	0.00%	*	*
Industrial	Metal Crown, Closure, and Other Metal Stamping (except Automotive)	332119	500	15,247	0.18%	1.08%	0.15%	0.03%	0.01%	*	*
Industrial	Hand and Edge Tool Manufacturing^	332212	500 (2007 Size Standards)	15,247	0.25%	*	*	*	*	*	*
Industrial	Prefabricated Metal Building and Component Manufacturing	332311	750	15,247	0.15%	*	0.10%	0.03%	*	*	*
Industrial	Fabricated Structural Metal Manufacturing	332312	500	15,247	0.16%	*	0.11%	0.02%	*	*	*
Industrial	Metal Window and Door Manufacturing	332321	750	57,102	0.58%	*	0.55%	0.12%	0.04%	*	*
Industrial	Sheet Metal Work Manufacturing	332322	500	15,247	0.29%	1.11%	0.17%	0.04%	*	*	*
Industrial	Metal Can Manufacturing	332431	1,500	43,429	0.05%	*	0.07%	0.03%	*	*	*
Industrial	Other Metal Container Manufacturing	332439	500	20,948	0.19%	1.48%	0.13%	0.04%	0.01%	*	*
Industrial	Bolt, Nut, Screw, Rivet, and Washer Manufacturing	332722	500	15,247	0.12%	1.00%	0.12%	0.03%	0.01%	*	*
Industrial	Metal Heat Treating	332811	750	15,247	0.17%	*	0.17%	*	*	*	*
Industrial	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers	332812	500	48,487	0.87%	5.75%	0.46%	0.06%	*	*	*
Industrial	Electroplating, Plating, Polishing, Anodizing, and Coloring	332813	500	20,948	0.65%	2.55%	0.34%	*	*	*	*
Industrial	Other Fabricated Metal Manufacturing	332990	#N/A	15,247	*	*	*	*	*	*	*
Industrial	Small Arms Ammunition Manufacturing	332992	1,250	15,247	0.04%	*	*	*	*	*	*
Industrial	Ammunition (except Small Arms) Manufacturing	332993	1,500	20,948	0.03%	*	*	*	*	*	*

(continued)

Table 6-9. Avoided Cost to Sales in Year 5 under ALTERNATIVE SCENARIO 2 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20-99	100~499	500~999	1000~2499	≥2500
Industrial	All Other Miscellaneous Fabricated Metal Product Manufacturing	332999	750	20,948	0.50%	2.33%	0.25%	0.05%	0.01%	*	*
Industrial	Farm Machinery and Equipment Manufacturing	333111	1,250	20,948	0.06%	*	0.16%	0.02%	0.00%	0.00%	*
Industrial	Lawn and Garden Tractor and Home Lawn and Garden Equipment Manufacturing	333112	1,500		**	*, **	*, **	**	**	*, **	*, **
Industrial	Construction Machinery Manufacturing	333120	1,250	12,446	0.02%	*	0.08%	0.01%	0.00%	0.00%	*
Industrial	Mining Machinery and Equipment Manufacturing	333131	500		**	*, **	**	**	*, **	*, **	*, **
Industrial	Printing Machinery and Equipment Manufacturing^	333293	500 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Photographic and Photocopying Equipment Manufacturing	333316	1,000		**	*, **	**	*, **	*, **	*, **	*, **
Industrial	Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing	333415	1,250		**	**	**	**	**	**	*, **
Industrial	Machine Tool (Metal Cutting Types) Manufacturing^	333512	500 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Machine Tool (Metal Forming Types) Manufacturing^	333513	500 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Turbine and Turbine Generator Set Units Manufacturing	333611	1,500		**	*, **	*, **	**	**	**	*, **
Industrial	Other Engine Equipment Manufacturing	333618	1,500	23,798	0.03%	0.94%	0.11%	0.02%	0.00%	0.00%	*
Industrial	Overhead Traveling Crane, Hoist, and Monorail System Manufacturing	333923	1,250		**	*, **	**	**	*, **	*, **	*, **
Industrial	Welding and Soldering Equipment Manufacturing	333992	1,250		**	**	**	**	*, **	**	*, **
Industrial	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	334220	1,250		**	**	**	**	**	**	**
Industrial	Electron Tube Manufacturing^	334411	750 (2007 Size Standards)		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Bare Printed Circuit Board Manufacturing	334412	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Semiconductor and Related Device Manufacturing	334413	1,250	40,679	0.07%	*	0.13%	0.05%	0.01%	0.00%	*

(continued)

Table 6-9. Avoided Cost to Sales in Year 5 under ALTERNATIVE SCENARIO 2 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use	334512	500		**	*, **	**	*, **	**	*, **	*, **
Industrial	Blank Magnetic and Optical Recording Media Manufacturing	334613	1,000		**	*, **	*, **	*, **	*, **	*, **	*, **
Industrial	Electric Lamp Bulb and Part Manufacturing	335110	1,250	15,247	0.05%	*	*	0.03%	*	*	*
Industrial	Household Laundry Equipment Manufacturing	335224	1,250	36,901	*	*	*	*	*	*	*
Industrial	Other Major Household Appliance Manufacturing	335228	1,000	23,798	0.01%	*	*	*	0.01%	*	*
Industrial	Power, Distribution, and Specialty Transformer Manufacturing	335311	750	15,247	0.06%	*	0.11%	0.02%	0.01%	*	*
Industrial	Motor and Generator Manufacturing	335312	1,250	23,798	0.09%	*	0.20%	0.03%	*	*	*
Industrial	Storage Battery Manufacturing	335911	1,250	15,247	0.03%	*	*	0.02%	0.01%	*	*
Industrial	Current-Carrying Wiring Device Manufacturing	335931	500	15,247	0.09%	*	0.13%	0.03%	0.01%	*	*
Industrial	Noncurrent-Carrying Wiring Device Manufacturing	335932	1,000	15,247	0.04%	*	0.07%	0.02%	*	*	*
Industrial	Carbon and Graphite Product Manufacturing	335991	750	63,290	0.26%	*	0.38%	0.08%	*	*	*
Industrial	Automobile Manufacturing	336111	1,500	43,644	0.01%	*	*	*	*	0.00%	0.00%
Industrial	Light Truck and Utility Vehicle Manufacturing	336112	1,500	63,290	0.00%	*	*	0.11%	*	*	0.00%
Industrial	Heavy Duty Truck Manufacturing	336120	1,500	57,102	0.02%	*	*	*	0.01%	0.00%	*
Industrial	Motor Vehicle Body Manufacturing	336211	1,000	57,102	0.35%	*	0.50%	0.10%	0.02%	*	*
Industrial	Truck Trailer Manufacturing	336212	1,000	15,247	0.07%	*	0.14%	0.02%	0.01%	*	*
Industrial	Motor Vehicle Gasoline Engine and Engine Parts Manufacturing	336310	1,000	23,798	0.06%	*	0.17%	0.02%	0.00%	*	*
Industrial	Carburetor, Piston, Piston Ring, and Valve Manufacturing^	336311	500 (2007 Size Standards)	15,247	0.06%	*	*	*	*	*	*
Industrial	Gasoline Engine and Engine Parts Manufacturing^	336312	750 (2007 Size Standards)	23,798	0.06%	*	*	*	*	*	*
Industrial	Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing	336330	1,000	23,798	0.05%	*	0.13%	0.02%	0.01%	*	*
Industrial	Motor Vehicle Brake System Manufacturing	336340	1,250	15,247	0.03%	*	0.06%	0.01%	0.01%	*	*
Industrial	Motor Vehicle Transmission and Power Train Parts Manufacturing	336350	1,500	23,798	0.03%	*	0.09%	0.02%	0.01%	0.00%	*
Industrial	Motor Vehicle Seating and Interior Trim Manufacturing	336360	1,500	15,247	0.03%	*	0.07%	0.01%	0.00%	*	*

(continued)

Table 6-9. Avoided Cost to Sales in Year 5 under ALTERNATIVE SCENARIO 2 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20-99	100~499	500~999	1000~2499	≥2500
Industrial	Motor Vehicle Metal Stamping	336370	1,000	15,247	0.04%	0.70%	0.09%	0.02%	0.01%	0.00%	*
Industrial	Other Motor Vehicle Parts Manufacturing	336390	1,000	45,144	0.11%	1.65%	0.21%	0.04%	0.01%	0.01%	*
Industrial	All Other Motor Vehicle Parts Manufacturing^	336399	750 (2007 Size Standards)	23,798	0.06%	*	*	*	*	*	*
Industrial	Aircraft Manufacturing	336411	1,500	104,882	0.02%	*	1.02%	0.11%	0.03%	0.01%	0.00%
Industrial	Aircraft Engine and Engine Parts Manufacturing	336412	1,500	57,102	0.07%	2.71%	0.42%	0.06%	0.02%	0.01%	0.00%
Industrial	Other Aircraft Parts and Auxiliary Equipment Manufacturing	336413	1,250	50,126	0.12%	*	0.36%	0.07%	0.02%	*	0.00%
Industrial	Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing	336415	1,250	15,247	0.01%	*	*	*	*	0.00%	*
Industrial	Railroad Rolling Stock Manufacturing	336510	1,500	15,247	0.02%	*	0.06%	0.01%	0.00%	*	*
Industrial	Ship Building and Repairing	336611	1,250	53,309	0.14%	3.45%	0.48%	0.09%	0.04%	0.01%	0.00%
Industrial	Boat Building	336612	1,000	15,207	0.17%	*	0.14%	0.02%	0.01%	*	*
Industrial	Military Armored Vehicle, Tank, and Tank Component Manufacturing	336992	1,500	23,798	0.02%	*	*	0.03%	*	*	*
Industrial	Wood Kitchen Cabinet and Countertop Manufacturing	337110	750	9,467	0.56%	*	*	0.03%	0.01%	*	*
Industrial	Upholstered Household Furniture Manufacturing	337121	1,000	23,798	0.26%	*	*	0.07%	0.02%	*	*
Industrial	Nonupholstered Wood Household Furniture Manufacturing	337122	750	53,297	2.92%	*	0.90%	0.18%	*	*	*
Industrial	Institutional Furniture Manufacturing	337127	500	15,247	0.22%	*	0.20%	0.04%	*	*	*
Industrial	Wood Office Furniture Manufacturing	337211	1,000	57,102	0.78%	*	0.76%	0.12%	*	*	*
Industrial	Office Furniture (except Wood) Manufacturing	337214	1,000	25,834	0.07%	*	0.28%	0.04%	0.01%	*	*
Industrial	Showcase, Partition, Shelving, and Locker Manufacturing	337215	500	15,247	0.23%	*	0.18%	0.04%	0.01%	*	*
Industrial	Blind and Shade Manufacturing	337920	1,000	15,247	0.29%	*	0.18%	0.04%	*	*	*
Industrial	Surgical and Medical Instrument Manufacturing	339112	1,000		**	*, **	*, **	**	**	**	*, **
Industrial	Surgical Appliance and Supplies Manufacturing	339113	750		**	*, **	*, **	**	**	**	*, **
Industrial	Jewelry and Silverware Manufacturing	339910	500		**	**	**	*, **	*, **	*, **	*, **

(continued)

Table 6-9. Avoided Cost to Sales in Year 5 under ALTERNATIVE SCENARIO 2 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Industrial	Sporting and Athletic Goods Manufacturing	339920	750		**	**	**	**	**	**	*, **
Industrial	Office Supplies (except Paper) Manufacturing	339940	750		**	*, **	**	**	*, **	*, **	*, **
Industrial	Gasket, Packing, and Sealing Device Manufacturing	339991	500		**	*, **	**	**	**	*, **	*, **
Industrial	Burial Casket Manufacturing	339995	1,000	15,247	0.21%	*	*	*	*	*	*
Industrial	All Other Miscellaneous Manufacturing	339999	500	23,798	1.12%	4.47%	0.34%	0.03%	*	*	*
Commercial	Grain and Field Bean Merchant Wholesalers	424510	200		**	**	**	*, **	*, **	*, **	*, **
Commercial	Petroleum Bulk Stations and Terminals	424710	200	20,948	0.01%	0.03%	0.01%	*	*	*	*
Commercial	Scheduled Passenger Air Transportation	481111	1,500		**	**	**	*, **	*, **	*, **	*, **
Commercial	Line-Haul Railroads	482111	1,500		*, **	*, **	*, **	*, **	*, **	*, **	*, **
Energy	Pipeline Transportation of Crude Oil	486110	1,500		**	**	**	*, **	*, **	*, **	*, **
Energy	Pipeline Transportation of Natural Gas	486210	\$27.5 million	28,240	0.24%	0.57%	0.08%	*	*	*	*
Energy	Pipeline Transportation of Refined Petroleum Products	486910	1,500		**	**	*, **	*, **	*, **	*, **	*, **
Commercial	Support Activities for Rail Transportation	488210	\$15 million	15,247	0.37%	1.32%	0.21%	*	*	*	*
Commercial	Marine Cargo Handling	488320	\$38.5 million		**	**	**	*, **	*, **	*, **	*, **
Commercial	General Warehousing and Storage	493110	\$27.5 million	24,809	1.34%	2.75%	0.84%	*	*	*	*
Commercial	Other Warehousing and Storage	493190	\$27.5 million	23,798	0.92%	3.35%	0.66%	*	*	*	*
Commercial	Lessors of Nonresidential Buildings (except Miniwarehouses)	531120	\$27.5 million		**	**	**	*, **	*, **	*, **	*, **
Commercial	Testing Laboratories	541380	\$15 million		**	**	**	*, **	*, **	*, **	*, **
Commercial	Research and Development in the Physical, Engineering and Life Sciences (except Nanotechnology and Biotechnology)^^^	541715	1,000		*, **	*, **	*, **	*, **	*, **	*, **	*, **
Commercial	All Other Support Services	561990	\$11 million		**	**	**	*, **	*, **	*, **	*, **
Waste Treatment	Hazardous Waste Treatment and Disposal	562211	\$38.5 million	88,855	1.04%	5.00%	0.74%	*	*	*	*
Waste Treatment	Solid Waste Landfill	562212	\$38.5 million	63,290	1.46%	2.83%	0.46%	*	*	*	*
Waste Treatment	Solid Waste Combustors and Incinerators	562213	\$38.5 million	23,798	0.10%	*	0.07%	*	*	*	*
Waste Treatment	Remediation Services	562910	\$20.5 million	15,247	0.41%	1.28%	0.21%	*	*	*	*
Educational Services	Colleges, Universities, and Professional Schools	611310	\$27.5 million	37,382	*	*	*	*	*	*	*

(continued)

Table 6-9. Avoided Cost to Sales in Year 5 under ALTERNATIVE SCENARIO 2 (continued)

Sector	NAICS Descriptions	NAICS	SBA Size Standard (2017)	Average Avoided Cost/Entity (2017\$)	Avoided Cost to Sales/Entity by Employee Size Categories (%)						
					All	≤19	20~99	100~499	500~999	1000~2499	≥2500
Commercial	Amusement and Theme Parks	713110	\$38.5 million		**	**	**	*, **	*, **	*, **	*, **
Commercial	Linen and Uniform Supply	812330	#N/A		*, **	*, **	*, **	*, **	*, **	*, **	*, **
Commercial	Industrial Launderers	812332	\$38.5 million	15,247	0.26%	0.98%	0.24%	*	*	*	*

Notes:

Blanks in “Average Avoided Cost/Entity” column are for NAICS where zero facilities are eligible to obtain area source status. NA means it is not a valid 2012 NAICS code, thus an SBA Size Standard is not available.

*No receipts data available from Census; cost-to-sales ratios cannot be calculated.

**Zero facilities estimated to obtain area source status and no estimated net costs (savings); cost-to-sales ratios cannot be calculated.

*,**Denotes a data status as a combination of footnotes * and **.

Sources: 2012 Economic Census, 2012 County Business Patterns, 2017 SBA Size Standards, Federal Reserve Bank of St. Louis Economic Research, Eastern Research Group. August 2020. ERG MM2A Database Memorandum, Analytical Evaluations & Summary of Industries Potentially Impacted by the Final Rule “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD; Eastern Research Group. August 2020. ERG MM2A Cost Analysis Memorandum, Compliance cost savings analysis for the final rulemaking “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD., SBA February 2016 Size Standards, SBA 2007 Size Standards.

6.6 Comparison of the Percentile Results for Each Scenario

As depicted in Table 6-10 below, the year 1 and 5 percentile results across all employment size categories are similar across the three scenarios with year 1 showing more similarity across scenarios than year 5. In year 1, the twenty-fifth percentiles are -0.01 percent for each scenario, the medians are less than 0.01 percent for each scenario, and the seventy-fifth percentiles are less than 0.01 percent for each scenario. In year 5, the twenty-fifth percentiles are between 0.01 percent and 0.03 percent for the three scenarios, the median estimates are between 0.05 percent and 0.06 percent for each scenario, and the seventy-fifth percentiles are between 0.17 percent and 0.23 percent for the three scenarios (0.17 percent for the primary scenario, 0.23 percent for alternative scenario 1, and 0.18 percent for alternative scenario 2). All of these results are lower than those for the proposal due to the lower estimates of net cost savings for this final rule compared to the proposal.

Table 6-10. Avoided Cost-to-Sales Ratios Percentile Results for the Three Scenarios

	PRIMARY SCENARIO		ALTERNATIVE SCENARIO 1		ALTERNATIVE SCENARIO 2	
	Year 1	Year 5	Year 1	Year 5	Year 1	Year 5
25th Percentile	-0.01%	0.01%	-0.01%	0.03%	-0.01%	0.02%
50th Percentile (Median)	0.00%	0.05%	0.00%	0.05%	0.00%	0.06%
75th Percentile	0.00%	0.17%	0.00%	0.23%	0.00%	0.18%

Note:

The year 5 percentile results are for year 5 and are also the annual results for years thereafter.

Sources: 2012 Economic Census, 2012 County Business Patterns, 2017 SBA Size Standards, SBA February 2016 Size Standards, SBA 2007 Size Standards, Federal Reserve Bank of St. Louis Economic Research, Eastern Research Group. August 2020. ERG MM2A Database Memorandum, Analytical Evaluations & Summary of Industries Potentially Impacted by the Final Rule “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD; Eastern Research Group. August 2020. ERG MM2A Cost Analysis Memorandum, Compliance cost savings analysis for the final rulemaking “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD.

SECTION 7. LIMITATIONS AND UNCERTAINTIES

The costs and economic impacts estimated in this RIA are subject to limitations and uncertainties. The most prominent uncertainty is that the EPA does not know what major sources will take advantage of the opportunity to reclassify to area source status. The original 2007 proposal did not provide analyses of removing the OIAI because it was stated that impacts could not be quantified without knowing which sources will avail themselves of the regulatory provisions proposed in this rule and what methods of HAP emission reductions will be used. In addition, the 2007 proposal also indicated, “It is unknown how many sources would choose to take permit conditions that would limit their PTE to below major source levels. Within this group, it also is not known how many sources may increase their emissions from the major source MACT level (assuming the level is below the MST). Similarly, we cannot identify or quantify the universe of sources that would decrease their HAP emissions to below the level required by the NESHAP to achieve area source status.”

The final rule provides potential regulatory relief (*i.e.*, the avoided costs) to affected major sources that are eligible to reclassify. Regulatory relief estimates as measured by avoided costs are provided for years 1 through 5 after promulgation of this rulemaking. The avoided costs are based on the best data available currently regarding sources affected and burden cost estimates but are subject to uncertainties.

This RIA is limited in its analyses because it estimates administrative burden reduction and some economic impact as measured by avoided cost-to-sales ratios, and we are unable to provide a quantitative estimate of benefits or disbenefits as explained in the benefits/disbenefits section of this RIA. The analysis does not measure costs or cost savings related to changes in the use of control equipment (*e.g.*, decrease in control device operating and maintenance costs due to reduced device use) except for potential control cost impacts associated with the illustrative alternative scenario 2 scenario as presented in Section 4, and does not provide quantitative estimates of changes in benefits.

In addition, the analysis presumes a zero probability of an area source reclassifying to major status after the source has reclassified to area. Moreover, because these estimates presume a fixed state of the affected industries into the future, it does not capture the potential for increased entry into affected markets because of the alleviated regulatory burden. This could subsequently induce additional regulatory costs on new firms and state regulatory agencies. With these considerations in mind, the cost savings estimates in the RIA may serve as an upper bound.

7.1 Avoided Cost Estimate Limitations and Uncertainties

7.1.1 Uncertainties in Estimates of Affected Sources

These estimates presume that the number of sources in the RTR modeling files is an accurate indication of the number of sources, whether available directly or from an extrapolated approach based on RTR modeling files and others, and their HAP emissions for source categories currently and in the near future. Some of the RTR modeling files contain emissions and source data that are several years old. In addition, the NEI data used to estimate the number of affected sources for some source categories are from 2017. Changes in the source categories due to mergers and acquisitions and other economic factors (i.e., effects from the COVID-19 pandemic) since then may mean some differences between the information used in the analysis and numbers of sources in these categories currently and in the near future.

7.1.2 Uncertainties in Facility Estimates

There is uncertainty about the number of facilities in source categories for which the EPA did not collect and review permits. The analysis is likely to overestimate the number of facilities in these source categories. This overestimate could be in the range of 5 to 10 percent of the estimated number of facilities. The accuracy of the emissions values used by the EPA from RTR Emissions datasets depends on factors such as the data source, method, completeness, and other factors. This could influence the EPA's estimate of the number of facilities below MST thresholds.

The emission estimates considered by the EPA in the analysis are annual totals for certain years and do not account for year-to-year variations. Therefore, the estimate of the number of facilities with emissions below MST thresholds is based on a single year's emission estimate for each facility, whereas facilities are likely to reclassify based on estimated emissions several years in the future.

7.1.3 Uncertainties in Permitting and Supporting Statement Costs

The permitting costs used in the cost analysis to generate the cost savings estimates are surrogate values from the minor NSR permitting process and Administrative Amendments under 40 CRR part 70 permitting process. Thus, there may be variation in such costs by source category at the source level that this analysis may not capture. The current and future compliance costs are based on compliance costs estimated to fulfill Paperwork Reduction Act requirements (44 U.S.C. § 3501 et seq.). Those costs are estimated for each major source subpart for a typical facility using the estimate of hours needed to complete monitoring, recordkeeping, and reporting activities, and other capital and operation and maintenance costs. These estimates are subject to

public review and comment, but they are not the actual costs for each facility. The estimated compliance costs after facilities obtain area source status were based on the average estimated compliance costs for a relatively small number of area source rules. Each major source rule does not have a corresponding area source rule, so the average area source rule cost may not be representative of the actual compliance cost for all source categories.

In addition, the costs in the ICRs used in the cost savings analysis may reflect data that are different from the most current information. These uncertainties are relevant for the estimates of PV and EAV for each scenario as well as the estimates of reduced administrative burden provided by the MM2A Cost Analysis Memorandum.

7.2 Economic Impact Data and Analysis Limitations and Uncertainties

There is uncertainty in the estimates of sources affected by this final rule and the burden costs used to estimate the regulatory relief from this rule, as mentioned previously in this RIA. These uncertainties also affect the economic impact analysis. The economic impact analysis compares the avoided burden cost estimates with average industry revenues to gauge the impact of the final MM2A rule for affected sources. We used average industry revenue and average establishment revenue estimates by entity size to estimate the avoided cost-to-sales ratios. The actual impacts to individual entities affected by this policy change may differ from industry averages.

The average entity costs used to compute the sales test vary across sources but are the same across establishment size categories. As a result, the sales test may overstate the cost-to-receipt ratio for establishments owned by small businesses, all other factors remaining the same. In addition, a major assumption in the estimation of potential cost savings is that all major sources in each source category that can reclassify to an area source will do so subject to a HAP PTE limits. It is possible that major sources may choose not to reclassify based on cost savings not being a sufficient incentive to do so, or for other reasons (*e.g.*, companies concerned with their environmental reputation). For example, facilities that have already made substantial investments in controls or process changes needed to comply may choose to retain major source status to maintain flexibility to allow for future increases in production. This uncertainty affects the number of facilities that would be eligible to obtain area source status.

7.3 Sales Test Data Limitations and Uncertainties

Using the 2012 Economic Census, we collected and organized data on number of establishments, employment, and receipts for affected sources represented by NAICS codes. However, because of confidentiality issues, some data values were not available or reported with

a range of values. In addition, some NAICS codes were not valid 2012 NAICS codes, and either no data were reported for them in the 2012 Economic Census or limited data were reported not broken down by size categories. These data limitations prevented us from reporting avoided cost-to-sales ratios for every employment size category for some NAICS codes. Table 7-1 lists these data limitations by NAICS code.

Table 7-1. Data Limitations for Specific NAICS Codes

NAICS	Data Limitations
115114	Not covered in Economic Census, used 2012 County Business Patterns (no revenue data)
221119	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)
311222	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)
311223	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)
313111	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)
313113	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)
313221	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)
313311	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)
314992	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)
322222	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)
323110	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)
325131	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)
325132	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)
325181	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)
325182	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)
325188	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)
325192	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)
325221	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)
325222	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)
327124	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)
331111	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)
331112	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)

(continued)

Table 7-1. Data Limitations for Specific NAICS Codes (continued)

NAICS	Data Limitations
331312	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)
331411	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)
331419	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)
331422	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)
331521	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)
332212	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)
332990	Invalid NAICS Code
333293	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)
333512	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)
333513	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)
334411	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)
336311	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)
336312	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)
336399	2007 NAICS: Data only available for all establishments in 2012 Economic Census (no data for employment-size categories)
482111	Not covered in Economic Census
541715	2017 NAICS: Not covered in 2012 Economic Census
611310	Not covered in Economic Census, used 2012 County Business Patterns (no revenue data)
812330	Invalid NAICS Code
922140	Not covered in Economic Census
927110	Not covered in Economic Census
928110	Not covered in Economic Census
999999	Unclassified NAICS

Sources: 2012 Economic Census, 2012 County Business Patterns.

The underlying establishment and receipts data are a limiting factor because if either of these measures is not reported for a certain category, we cannot calculate the average receipts per establishment, which is needed for the avoided cost-to-sales ratio calculation. However, there are cases where avoided cost-to-sales ratios are not reported because zero facilities are estimated to obtain area source status; therefore, there are no facilities to calculate the average cost per entity.

This RIA estimates administrative burden reduction and some economic impact as measured by avoided cost-to-sales ratios. The analysis does not measure overall costs or cost savings related to control equipment changes except for those provided in the illustrative analysis

of the alternative scenario 2 as presented earlier in this RIA and does not provide quantitative estimates of overall emission changes except for some source categories as mentioned earlier in this RIA and benefits or disbenefits.

7.4 Benefits Limitations and Uncertainties

As mentioned earlier in this RIA, we are uncertain as to the distribution of the changes in HAP and other emissions across the broad array of sources impacted by this final rule. As such, we are unable to quantify the changes in emissions across these sources and cannot either simulate the change in air quality or characterize the impact of these changes to human health. This is not to imply that changes in emissions will not affect human health. Rather, our approach reflects the challenges associated with modeling the direct and indirect impacts of the reductions in emissions for these sectors with the data currently available. In place of quantitative estimates of the quantity and economic value of the pollutant changes, we instead characterize in the benefits/disbenefits section these impacts in qualitative terms.

SECTION 8.

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ATTACHMENT A
SECTORS AND SOURCE CATEGORIES AFFECTED BY THE FINAL MM2A RULE

Table A-1. Sources That May Potentially Experience Regulatory Relief under the PRIMARY SCENARIO

Sector	NAICS Descriptions	NAICS	Facilities	
			Number of Facilities Subject to MACT	Number of Facilities That May Potentially Experience Regulatory Relief
Agriculture	Postharvest Crop Activities (except Cotton Ginning)	115114	1	0
Energy	Crude Petroleum and Natural Gas Extraction	211111	120	48
Energy	Natural Gas Liquid Extraction	211112	26	11
Industrial	Iron Ore Mining	212210	11	0
Industrial	Lead Ore and Zinc Ore Mining	212231	1	0
Industrial	Copper Ore and Nickel Ore Mining	212234	1	0
Industrial	All Other Metal Ore Mining	212299	1	0
Industrial	Industrial Sand Mining	212322	3	0
Industrial	Kaolin and Ball Clay Mining	212324	3	0
Industrial	Potash, Soda, and Borate Mineral Mining	212391	6	0
Industrial	All Other Nonmetallic Mineral Mining	212399	1	0
Energy	Support Activities for Oil and Gas Operations	213112	3	1
Utilities	Hydroelectric Power Generation	221111	1	1
Utilities	Fossil Fuel Electric Power Generation	221112	334	100
Utilities	Biomass Electric Power Generation	221117	5	4
Utilities	Other Electric Power Generation	221118	1	1
Utilities	Other Electric Power Generation^	221119	8	6
Utilities	Electric Power Distribution	221122	1	1
Utilities	Natural Gas Distribution	221210	13	9
Utilities	Water Supply and Irrigation Systems	221310	2	2
Utilities	Sewage Treatment Facilities	221320	17	12
Utilities	Steam and Air-Conditioning Supply	221330	22	15
Industrial	Other Animal Food Manufacturing	311119	1	0
Industrial	Wet Corn Milling	311221	16	0
Industrial	Soybean Processing^	311222	16	0
Industrial	Other Oilseed Processing^	311223	5	0
Industrial	Soybean and Other Oilseed Processing	311224	116	2
Industrial	Fats and Oils Refining and Blending	311225	2	0
Industrial	Beet Sugar Manufacturing	311313	11	0
Industrial	Cane Sugar Manufacturing	311314	3	0
Industrial	Frozen Fruit, Juice, and Vegetable Manufacturing	311411	2	0
Industrial	Fruit and Vegetable Canning	311421	1	0
Industrial	Specialty Canning	311422	2	0
Industrial	Cheese Manufacturing	311513	2	0

(continued)

Table A-1. Sources That May Potentially Experience Regulatory Relief under the PRIMARY SCENARIO (continued)

Sector	NAICS Descriptions	NAICS	Facilities	
			Number of Facilities Subject to MACT	Number of Facilities That May Potentially Experience Regulatory Relief
Industrial	Dry, Condensed, and Evaporated Dairy Product Manufacturing	311514	3	0
Industrial	Rendering and Meat Byproduct Processing	311613	1	0
Industrial	Commercial Bakeries	311812	2	0
Industrial	Other Snack Food Manufacturing	311919	1	0
Industrial	Coffee and Tea Manufacturing	311920	1	0
Industrial	Flavoring Syrup and Concentrate Manufacturing	311930	1	0
Industrial	Spice and Extract Manufacturing	311942	4	0
Industrial	All Other Miscellaneous Food Manufacturing	311999	6	0
Industrial	Breweries	312120	3	1
Industrial	Distilleries	312140	1	0
Industrial	Tobacco Manufacturing	312230	1	0
Industrial	Yarn Spinning Mills^	313111	1	1
Industrial	Thread Mills^	313113	1	1
Industrial	Broadwoven Fabric Mills	313210	2	2
Industrial	Narrow Fabric Mills^	313221	1	1
Industrial	Textile and Fabric Finishing Mills	313310	1	1
Industrial	Broadwoven Fabric Finishing Mills^	313311	3	2
Industrial	Fabric Coating Mills	313320	50	28
Industrial	Tire Cord and Tire Fabric Mills^	314992	1	0
Industrial	Leather and Hide Tanning and Finishing	316110	6	4
Industrial	Sawmills	321113	61	11
Industrial	Wood Preservation	321114	3	0
Industrial	Hardwood Veneer and Plywood Manufacturing	321211	3	0
Industrial	Softwood Veneer and Plywood Manufacturing	321212	29	6
Industrial	Engineered Wood Member (except Truss) Manufacturing	321213	6	1
Industrial	Reconstituted Wood Product Manufacturing	321219	315	61
Industrial	Wood Window and Door Manufacturing	321911	4	0
Industrial	Cut Stock, Resawing Lumber, and Planing	321912	4	0
Industrial	All Other Miscellaneous Wood Product Manufacturing	321999	3	0
Industrial	Pulp Mills	322110	18	3
Industrial	Paper (except Newsprint) Mills	322121	282	11
Industrial	Newsprint Mills	322122	7	1
Industrial	Paperboard Mills	322130	36	7
Industrial	Corrugated and Solid Fiber Box Manufacturing	322211	174	55
Industrial	Paper Bag and Coated and Treated Paper Manufacturing	322220	17	3
Industrial	Coated and Laminated Paper Manufacturing^	322222	12	2

(continued)

Table A-1. Sources That May Potentially Experience Regulatory Relief under the PRIMARY SCENARIO (continued)

Sector	NAICS Descriptions	NAICS	Facilities	
			Number of Facilities Subject to MACT	Number of Facilities That May Potentially Experience Regulatory Relief
Industrial	Sanitary Paper Product Manufacturing	322291	2	0
Industrial	All Other Converted Paper Product Manufacturing	322299	1	0
Industrial	Commercial Lithographic Printing^	323110	1	1
Industrial	Commercial Printing (except Screen and Books)	323111	188	110
Industrial	Books Printing	323117	3	2
Industrial	Petroleum Refineries	324110	430	77
Industrial	Asphalt Shingle and Coating Materials Manufacturing	324122	3	0
Industrial	All Other Petroleum and Coal Products Manufacturing	324199	4	0
Industrial	Petrochemical Manufacturing	325110	597	218
Industrial	Industrial Gas Manufacturing	325120	4	1
Industrial	Synthetic Dye and Pigment Manufacturing	325130	1	0
Industrial	Inorganic Dye and Pigment Manufacturing^	325131	3	1
Industrial	Synthetic Organic Dye and Pigment Manufacturing^	325132	2	0
Industrial	Other Basic Inorganic Chemical Manufacturing	325180	10	3
Industrial	Alkalies and Chlorine Manufacturing^	325181	4	1
Industrial	Carbon Black Manufacturing^	325182	21	7
Industrial	All Other Basic Inorganic Chemical Manufacturing^	325188	93	3
Industrial	Cyclic Crude and Intermediate Manufacturing^	325192	1	0
Industrial	Ethyl Alcohol Manufacturing	325193	7	2
Industrial	Cyclic Crude, Intermediate, and Gum and Wood Chemical Manufacturing	325194	2	0
Industrial	All Other Basic Organic Chemical Manufacturing	325199	77	23
Industrial	Plastics Material and Resin Manufacturing	325211	857	254
Industrial	Synthetic Rubber Manufacturing	325212	22	2
Industrial	Artificial and Synthetic Fibers and Filaments Manufacturing	325220	6	2
Industrial	Cellulosic Organic Fiber Manufacturing^	325221	1	0
Industrial	Noncellulosic Organic Fiber Manufacturing^	325222	4	1
Industrial	Nitrogenous Fertilizer Manufacturing	325311	16	6
Industrial	Phosphatic Fertilizer Manufacturing	325312	30	2
Industrial	Pesticide and Other Agricultural Chemical Manufacturing	325320	22	5
Industrial	Medicinal and Botanical Manufacturing	325411	4	1
Industrial	Pharmaceutical Preparation Manufacturing	325412	36	9

(continued)

Table A-1. Sources That May Potentially Experience Regulatory Relief under the PRIMARY SCENARIO (continued)

Sector	NAICS Descriptions	NAICS	Facilities	
			Number of Facilities Subject to MACT	Number of Facilities That May Potentially Experience Regulatory Relief
Industrial	Biological Product (except Diagnostic) Manufacturing	325414	1	0
Industrial	Paint and Coating Manufacturing	325510	48	19
Industrial	Adhesive Manufacturing	325520	4	1
Industrial	Surface Active Agent Manufacturing	325613	2	0
Industrial	Toilet Preparation Manufacturing	325620	2	0
Industrial	Explosives Manufacturing	325920	2	0
Industrial	Custom Compounding of Purchased Resins	325991	5	2
Industrial	Photographic Film, Paper, Plate, and Chemical Manufacturing	325992	4	1
Industrial	All Other Miscellaneous Chemical Product and Preparation Manufacturing	325998	10	3
Industrial	Plastics Packaging Film and Sheet (including Laminated) Manufacturing	326112	5	2
Industrial	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing	326113	16	7
Industrial	Unlaminated Plastics Profile Shape Manufacturing	326121	12	0
Industrial	Plastics Pipe and Pipe Fitting Manufacturing	326122	1	0
Industrial	Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing	326130	7	3
Industrial	Polystyrene Foam Product Manufacturing	326140	1	0
Industrial	Urethane and Other Foam Product (except Polystyrene) Manufacturing	326150	19	13
Industrial	Plastics Plumbing Fixture Manufacturing	326191	2	0
Industrial	All Other Plastics Product Manufacturing	326199	148	64
Industrial	Tire Manufacturing (except Retreading)	326211	39	19
Industrial	Rubber and Plastics Hoses and Belting Manufacturing	326220	6	2
Industrial	Rubber Product Manufacturing for Mechanical Use	326291	2	0
Industrial	All Other Rubber Product Manufacturing	326299	14	5
Industrial	Pottery, Ceramics, and Plumbing Fixture Manufacturing	327110	4	1
Industrial	Clay Building Material and Refractories Manufacturing	327120	76	47
Industrial	Clay Refractory Manufacturing [^]	327124	8	3
Industrial	Flat Glass Manufacturing	327211	2	0
Industrial	Other Pressed and Blown Glass and Glassware Manufacturing	327212	17	7
Industrial	Cement Manufacturing	327310	6	2
Industrial	Lime Manufacturing	327410	38	1

(continued)

Table A-1. Sources That May Potentially Experience Regulatory Relief under the PRIMARY SCENARIO (continued)

Sector	NAICS Descriptions	NAICS	Facilities	
			Number of Facilities Subject to MACT	Number of Facilities That May Potentially Experience Regulatory Relief
Industrial	Gypsum Product Manufacturing	327420	1	0
Industrial	Abrasive Product Manufacturing	327910	4	1
Industrial	Mineral Wool Manufacturing	327993	13	4
Industrial	All Other Miscellaneous Nonmetallic Mineral Product Manufacturing	327999	2	0
Industrial	Iron and Steel Mills and Ferroalloy Manufacturing	331110	73	39
Industrial	Iron and Steel Mills^	331111	50	3
Industrial	Electrometallurgical Ferroalloy Product Manufacturing^	331112	1	0
Industrial	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel	331210	5	2
Industrial	Rolled Steel Shape Manufacturing	331221	6	2
Industrial	Primary Aluminum Production^	331312	2	0
Industrial	Alumina Refining and Primary Aluminum Production	331313	16	2
Industrial	Secondary Smelting and Alloying of Aluminum	331314	56	7
Industrial	Aluminum Sheet, Plate, and Foil Manufacturing	331315	6	2
Industrial	Aluminum Extruded Product Manufacturing^	331316	1	0
Industrial	Other Aluminum Rolling, Drawing, and Extruding	331318	2	0
Industrial	Nonferrous Metal (except Aluminum) Smelting and Refining	331410	1	0
Industrial	Primary Smelting and Refining of Copper^	331411	0	0
Industrial	Primary Smelting and Refining of Nonferrous Metal (except Copper and Aluminum)^	331419	2	0
Industrial	Copper Rolling, Drawing, Extruding, and Alloying	331420	3	0
Industrial	Copper Wire (except Mechanical) Drawing^	331422	1	0
Industrial	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, and Extruding	331491	3	1
Industrial	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	331492	2	0
Industrial	Iron Foundries	331511	59	4
Industrial	Steel Foundries (except Investment)	331513	2	0
Industrial	Aluminum Die-Casting Foundries^	331521	1	0
Industrial	Aluminum Foundries (except Die-Casting)	331524	2	0
Industrial	Nonferrous Forging	332112	1	1
Industrial	Metal Crown, Closure, and Other Metal Stamping (except Automotive)	332119	1	1

(continued)

Table A-1. Sources That May Potentially Experience Regulatory Relief under the PRIMARY SCENARIO (continued)

Sector	NAICS Descriptions	NAICS	Facilities	
			Number of Facilities Subject to MACT	Number of Facilities That May Potentially Experience Regulatory Relief
Industrial	Hand and Edge Tool Manufacturing^	332212	1	1
Industrial	Prefabricated Metal Building and Component Manufacturing	332311	1	1
Industrial	Fabricated Structural Metal Manufacturing	332312	1	1
Industrial	Metal Window and Door Manufacturing	332321	5	4
Industrial	Sheet Metal Work Manufacturing	332322	1	1
Industrial	Metal Can Manufacturing	332431	14	9
Industrial	Other Metal Container Manufacturing	332439	4	2
Industrial	Bolt, Nut, Screw, Rivet, and Washer Manufacturing	332722	1	1
Industrial	Metal Heat Treating	332811	1	1
Industrial	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers	332812	433	280
Industrial	Electroplating, Plating, Polishing, Anodizing, and Coloring	332813	3	2
Industrial	Other Fabricated Metal Manufacturing	332990	1	1
Industrial	Small Arms Ammunition Manufacturing	332992	1	1
Industrial	Ammunition (except Small Arms) Manufacturing	332993	3	2
Industrial	All Other Miscellaneous Fabricated Metal Product Manufacturing	332999	3	2
Industrial	Farm Machinery and Equipment Manufacturing	333111	8	3
Industrial	Lawn and Garden Tractor and Home Lawn and Garden Equipment Manufacturing	333112	1	0
Industrial	Construction Machinery Manufacturing	333120	64	28
Industrial	Mining Machinery and Equipment Manufacturing	333131	2	0
Industrial	Printing Machinery and Equipment Manufacturing^	333293	1	0
Industrial	Photographic and Photocopying Equipment Manufacturing	333316	1	0
Industrial	Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing	333415	1	0
Industrial	Machine Tool (Metal Cutting Types) Manufacturing^	333512	1	0
Industrial	Machine Tool (Metal Forming Types) Manufacturing^	333513	1	0
Industrial	Turbine and Turbine Generator Set Units Manufacturing	333611	1	0
Industrial	Other Engine Equipment Manufacturing	333618	5	2

(continued)

Table A-1. Sources That May Potentially Experience Regulatory Relief under the PRIMARY SCENARIO (continued)

Sector	NAICS Descriptions	NAICS	Facilities	
			Number of Facilities Subject to MACT	Number of Facilities That May Potentially Experience Regulatory Relief
Industrial	Overhead Traveling Crane, Hoist, and Monorail System Manufacturing	333923	1	0
Industrial	Welding and Soldering Equipment Manufacturing	333992	2	0
Industrial	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	334220	1	0
Industrial	Electron Tube Manufacturing^	334411	1	0
Industrial	Bare Printed Circuit Board Manufacturing	334412	1	0
Industrial	Semiconductor and Related Device Manufacturing	334413	23	13
Industrial	Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use	334512	1	0
Industrial	Blank Magnetic and Optical Recording Media Manufacturing	334613	0	0
Industrial	Electric Lamp Bulb and Part Manufacturing	335110	1	1
Industrial	Household Laundry Equipment Manufacturing	335224	13	9
Industrial	Other Major Household Appliance Manufacturing	335228	2	2
Industrial	Power, Distribution, and Specialty Transformer Manufacturing	335311	1	1
Industrial	Motor and Generator Manufacturing	335312	2	2
Industrial	Storage Battery Manufacturing	335911	1	1
Industrial	Current-Carrying Wiring Device Manufacturing	335931	1	1
Industrial	Noncurrent-Carrying Wiring Device Manufacturing	335932	1	1
Industrial	Carbon and Graphite Product Manufacturing	335991	6	4
Industrial	Automobile Manufacturing	336111	66	18
Industrial	Light Truck and Utility Vehicle Manufacturing	336112	5	4
Industrial	Heavy Duty Truck Manufacturing	336120	8	5
Industrial	Motor Vehicle Body Manufacturing	336211	8	5
Industrial	Truck Trailer Manufacturing	336212	1	1
Industrial	Motor Vehicle Gasoline Engine and Engine Parts Manufacturing	336310	2	2
Industrial	Carburetor, Piston, Piston Ring, and Valve Manufacturing^	336311	1	1
Industrial	Gasoline Engine and Engine Parts Manufacturing^	336312	3	2
Industrial	Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing	336330	2	2
Industrial	Motor Vehicle Brake System Manufacturing	336340	1	1
Industrial	Motor Vehicle Transmission and Power Train Parts Manufacturing	336350	2	2

(continued)

Table A-1. Sources That May Potentially Experience Regulatory Relief under the PRIMARY SCENARIO (continued)

Sector	NAICS Descriptions	NAICS	Facilities	
			Number of Facilities Subject to MACT	Number of Facilities That May Potentially Experience Regulatory Relief
Industrial	Motor Vehicle Seating and Interior Trim Manufacturing	336360	1	1
Industrial	Motor Vehicle Metal Stamping	336370	1	1
Industrial	Other Motor Vehicle Parts Manufacturing	336390	13	7
Industrial	All Other Motor Vehicle Parts Manufacturing^	336399	2	2
Industrial	Aircraft Manufacturing	336411	125	102
Industrial	Aircraft Engine and Engine Parts Manufacturing	336412	8	5
Industrial	Other Aircraft Parts and Auxiliary Equipment Manufacturing	336413	10	6
Industrial	Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing	336415	1	1
Industrial	Railroad Rolling Stock Manufacturing	336510	1	1
Industrial	Ship Building and Repairing	336611	92	55
Industrial	Boat Building	336612	96	26
Industrial	Military Armored Vehicle, Tank, and Tank Component Manufacturing	336992	2	2
Industrial	Wood Kitchen Cabinet and Countertop Manufacturing	337110	347	233
Industrial	Upholstered Household Furniture Manufacturing	337121	2	2
Industrial	Nonupholstered Wood Household Furniture Manufacturing	337122	14	9
Industrial	Institutional Furniture Manufacturing	337127	1	1
Industrial	Wood Office Furniture Manufacturing	337211	5	4
Industrial	Office Furniture (except Wood) Manufacturing	337214	19	12
Industrial	Showcase, Partition, Shelving, and Locker Manufacturing	337215	1	1
Industrial	Blind and Shade Manufacturing	337920	1	1
Industrial	Surgical and Medical Instrument Manufacturing	339112	2	0
Industrial	Surgical Appliance and Supplies Manufacturing	339113	1	0
Industrial	Jewelry and Silverware Manufacturing	339910	1	0
Industrial	Sporting and Athletic Goods Manufacturing	339920	1	0
Industrial	Office Supplies (except Paper) Manufacturing	339940	1	0
Industrial	Gasket, Packing, and Sealing Device Manufacturing	339991	2	0
Industrial	Burial Casket Manufacturing	339995	3	1
Industrial	All Other Miscellaneous Manufacturing	339999	5	2
Commercial	Grain and Field Bean Merchant Wholesalers	424510	1	0
Commercial	Petroleum Bulk Stations and Terminals	424710	7	3
Commercial	Scheduled Passenger Air Transportation	481111	2	0
Commercial	Line-Haul Railroads	482111	1	0

(continued)

Table A-1. Sources That May Potentially Experience Regulatory Relief under the PRIMARY SCENARIO (continued)

Sector	NAICS Descriptions	NAICS	Facilities	
			Number of Facilities Subject to MACT	Number of Facilities That May Potentially Experience Regulatory Relief
Energy	Pipeline Transportation of Crude Oil	486110	1	0
Energy	Pipeline Transportation of Natural Gas	486210	257	103
Energy	Pipeline Transportation of Refined Petroleum Products	486910	1	0
Commercial	Support Activities for Rail Transportation	488210	3	1
Commercial	Marine Cargo Handling	488320	2	0
Commercial	General Warehousing and Storage	493110	180	57
Commercial	Other Warehousing and Storage	493190	6	2
Commercial	Lessors of Nonresidential Buildings (except Miniwarehouses)	531120	1	0
Commercial	Testing Laboratories	541380	2	0
Commercial	Research and Development in the Physical, Engineering and Life Sciences (except Nanotechnology and Biotechnology) ^{^^}	541715	2	0
Commercial	All Other Support Services	561990	1	0
Waste Treatment	Hazardous Waste Treatment and Disposal	562211	41	23
Waste Treatment	Solid Waste Landfill	562212	6	4
Waste Treatment	Solid Waste Combustors and Incinerators	562213	3	2
Waste Treatment	Remediation Services	562910	1	1
Educational Services	Colleges, Universities, and Professional Schools	611310	23	9
Commercial	Amusement and Theme Parks	713110	1	0
Commercial	Linen and Uniform Supply	812330	1	0
Commercial	Industrial Launderers	812332	3	1

Sources: 2012 Economic Census; Eastern Research Group. August 2020a. MM2A Database Memorandum, Documentation of the Data for Analytical Evaluations & Summary of Industries Potentially Impacted by the Final Rule “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD; Eastern Research Group. August 2020b. MM2A Cost Analysis Memorandum, Documentation of the compliance cost savings analysis for the final rulemaking “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD.

**Table A-2. Sources That May Potentially Experience Regulatory Relief under
ALTERNATIVE SCENARIO 1**

Sector	NAICS Descriptions	NAICS	Facilities	
			Number of Facilities Subject to MACT	Number of Facilities That May Potentially Experience Regulatory Relief
Agriculture	Postharvest Crop Activities (except Cotton Ginning)	115114	1	0
Energy	Crude Petroleum and Natural Gas Extraction	211111	120	40
Energy	Natural Gas Liquid Extraction	211112	26	9
Industrial	Iron Ore Mining	212210	11	0
Industrial	Lead Ore and Zinc Ore Mining	212231	1	0
Industrial	Copper Ore and Nickel Ore Mining	212234	1	0
Industrial	All Other Metal Ore Mining	212299	1	0
Industrial	Industrial Sand Mining	212322	3	0
Industrial	Kaolin and Ball Clay Mining	212324	3	0
Industrial	Potash, Soda, and Borate Mineral Mining	212391	6	0
Industrial	All Other Nonmetallic Mineral Mining	212399	1	0
Energy	Support Activities for Oil and Gas Operations	213112	3	1
Utilities	Hydroelectric Power Generation	221111	1	1
Utilities	Fossil Fuel Electric Power Generation	221112	334	85
Utilities	Biomass Electric Power Generation	221117	5	4
Utilities	Other Electric Power Generation	221118	1	1
Utilities	Other Electric Power Generation^	221119	8	5
Utilities	Electric Power Distribution	221122	1	1
Utilities	Natural Gas Distribution	221210	13	7
Utilities	Water Supply and Irrigation Systems	221310	2	2
Utilities	Sewage Treatment Facilities	221320	17	10
Utilities	Steam and Air-Conditioning Supply	221330	22	13
Industrial	Other Animal Food Manufacturing	311119	1	0
Industrial	Wet Corn Milling	311221	16	0
Industrial	Soybean Processing^	311222	16	0
Industrial	Other Oilseed Processing^	311223	5	0
Industrial	Soybean and Other Oilseed Processing	311224	116	1
Industrial	Fats and Oils Refining and Blending	311225	2	0
Industrial	Beet Sugar Manufacturing	311313	11	0
Industrial	Cane Sugar Manufacturing	311314	3	0
Industrial	Frozen Fruit, Juice, and Vegetable Manufacturing	311411	2	0
Industrial	Fruit and Vegetable Canning	311421	1	0
Industrial	Specialty Canning	311422	2	0
Industrial	Cheese Manufacturing	311513	2	0
Industrial	Dry, Condensed, and Evaporated Dairy Product Manufacturing	311514	3	0
Industrial	Rendering and Meat Byproduct Processing	311613	1	0
Industrial	Commercial Bakeries	311812	2	0

(continued)

**Table A-2. Sources That May Potentially Experience Regulatory Relief under
ALTERNATIVE SCENARIO 1 (continued)**

Sector	NAICS Descriptions	NAICS	Facilities	
			Number of Facilities Subject to MACT	Number of Facilities That May Potentially Experience Regulatory Relief
Industrial	Other Snack Food Manufacturing	311919	1	0
Industrial	Coffee and Tea Manufacturing	311920	1	0
Industrial	Flavoring Syrup and Concentrate Manufacturing	311930	1	0
Industrial	Spice and Extract Manufacturing	311942	4	0
Industrial	All Other Miscellaneous Food Manufacturing	311999	6	0
Industrial	Breweries	312120	3	1
Industrial	Distilleries	312140	1	0
Industrial	Tobacco Manufacturing	312230	1	0
Industrial	Yarn Spinning Mills^	313111	1	1
Industrial	Thread Mills^	313113	1	1
Industrial	Broadwoven Fabric Mills	313210	2	2
Industrial	Narrow Fabric Mills^	313221	1	1
Industrial	Textile and Fabric Finishing Mills	313310	1	1
Industrial	Broadwoven Fabric Finishing Mills^	313311	3	2
Industrial	Fabric Coating Mills	313320	50	26
Industrial	Tire Cord and Tire Fabric Mills^	314992	1	0
Industrial	Leather and Hide Tanning and Finishing	316110	6	4
Industrial	Sawmills	321113	61	8
Industrial	Wood Preservation	321114	3	0
Industrial	Hardwood Veneer and Plywood Manufacturing	321211	3	0
Industrial	Softwood Veneer and Plywood Manufacturing	321212	29	3
Industrial	Engineered Wood Member (except Truss) Manufacturing	321213	6	0
Industrial	Reconstituted Wood Product Manufacturing	321219	315	44
Industrial	Wood Window and Door Manufacturing	321911	4	0
Industrial	Cut Stock, Resawing Lumber, and Planing	321912	4	0
Industrial	All Other Miscellaneous Wood Product Manufacturing	321999	3	0
Industrial	Pulp Mills	322110	18	3
Industrial	Paper (except Newsprint) Mills	322121	282	9
Industrial	Newsprint Mills	322122	7	1
Industrial	Paperboard Mills	322130	36	6
Industrial	Corrugated and Solid Fiber Box Manufacturing	322211	174	46
Industrial	Paper Bag and Coated and Treated Paper Manufacturing	322220	17	2
Industrial	Coated and Laminated Paper Manufacturing^	322222	12	2
Industrial	Sanitary Paper Product Manufacturing	322291	2	0
Industrial	All Other Converted Paper Product Manufacturing	322299	1	0

(continued)

**Table A-2. Sources That May Potentially Experience Regulatory Relief under
ALTERNATIVE SCENARIO 1 (continued)**

Sector	NAICS Descriptions	NAICS	Facilities	
			Number of Facilities Subject to MACT	Number of Facilities That May Potentially Experience Regulatory Relief
Industrial	Commercial Lithographic Printing^	323110	1	1
Industrial	Commercial Printing (except Screen and Books)	323111	188	99
Industrial	Books Printing	323117	3	2
Industrial	Petroleum Refineries	324110	430	65
Industrial	Asphalt Shingle and Coating Materials Manufacturing	324122	3	0
Industrial	All Other Petroleum and Coal Products Manufacturing	324199	4	0
Industrial	Petrochemical Manufacturing	325110	597	190
Industrial	Industrial Gas Manufacturing	325120	4	1
Industrial	Synthetic Dye and Pigment Manufacturing	325130	1	0
Industrial	Inorganic Dye and Pigment Manufacturing^	325131	3	1
Industrial	Synthetic Organic Dye and Pigment Manufacturing^	325132	2	0
Industrial	Other Basic Inorganic Chemical Manufacturing	325180	10	2
Industrial	Alkalies and Chlorine Manufacturing^	325181	4	1
Industrial	Carbon Black Manufacturing^	325182	21	6
Industrial	All Other Basic Inorganic Chemical Manufacturing^	325188	93	3
Industrial	Cyclic Crude and Intermediate Manufacturing^	325192	1	0
Industrial	Ethyl Alcohol Manufacturing	325193	7	2
Industrial	Cyclic Crude, Intermediate, and Gum and Wood Chemical Manufacturing	325194	2	0
Industrial	All Other Basic Organic Chemical Manufacturing	325199	77	20
Industrial	Plastics Material and Resin Manufacturing	325211	857	197
Industrial	Synthetic Rubber Manufacturing	325212	22	2
Industrial	Artificial and Synthetic Fibers and Filaments Manufacturing	325220	6	2
Industrial	Cellulosic Organic Fiber Manufacturing^	325221	1	0
Industrial	Noncellulosic Organic Fiber Manufacturing^	325222	4	1
Industrial	Nitrogenous Fertilizer Manufacturing	325311	16	4
Industrial	Phosphatic Fertilizer Manufacturing	325312	30	2
Industrial	Pesticide and Other Agricultural Chemical Manufacturing	325320	22	3
Industrial	Medicinal and Botanical Manufacturing	325411	4	1
Industrial	Pharmaceutical Preparation Manufacturing	325412	36	4
Industrial	Biological Product (except Diagnostic) Manufacturing	325414	1	0
Industrial	Paint and Coating Manufacturing	325510	48	18
Industrial	Adhesive Manufacturing	325520	4	1

(continued)

**Table A-2. Sources That May Potentially Experience Regulatory Relief under
ALTERNATIVE SCENARIO 1 (continued)**

Sector	NAICS Descriptions	NAICS	Facilities	
			Number of Facilities Subject to MACT	Number of Facilities That May Potentially Experience Regulatory Relief
Industrial	Surface Active Agent Manufacturing	325613	2	0
Industrial	Toilet Preparation Manufacturing	325620	2	0
Industrial	Explosives Manufacturing	325920	2	0
Industrial	Custom Compounding of Purchased Resins	325991	5	2
Industrial	Photographic Film, Paper, Plate, and Chemical Manufacturing	325992	4	1
Industrial	All Other Miscellaneous Chemical Product and Preparation Manufacturing	325998	10	2
Industrial	Plastics Packaging Film and Sheet (including Laminated) Manufacturing	326112	5	2
Industrial	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing	326113	16	6
Industrial	Unlaminated Plastics Profile Shape Manufacturing	326121	12	0
Industrial	Plastics Pipe and Pipe Fitting Manufacturing	326122	1	0
Industrial	Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing	326130	7	2
Industrial	Polystyrene Foam Product Manufacturing	326140	1	0
Industrial	Urethane and Other Foam Product (except Polystyrene) Manufacturing	326150	19	13
Industrial	Plastics Plumbing Fixture Manufacturing	326191	2	0
Industrial	All Other Plastics Product Manufacturing	326199	148	46
Industrial	Tire Manufacturing (except Retreading)	326211	39	14
Industrial	Rubber and Plastics Hoses and Belting Manufacturing	326220	6	2
Industrial	Rubber Product Manufacturing for Mechanical Use	326291	2	0
Industrial	All Other Rubber Product Manufacturing	326299	14	3
Industrial	Pottery, Ceramics, and Plumbing Fixture Manufacturing	327110	4	1
Industrial	Clay Building Material and Refractories Manufacturing	327120	76	41
Industrial	Clay Refractory Manufacturing^	327124	8	3
Industrial	Flat Glass Manufacturing	327211	2	0
Industrial	Other Pressed and Blown Glass and Glassware Manufacturing	327212	17	5
Industrial	Cement Manufacturing	327310	6	2
Industrial	Lime Manufacturing	327410	38	1
Industrial	Gypsum Product Manufacturing	327420	1	0
Industrial	Abrasive Product Manufacturing	327910	4	1
Industrial	Mineral Wool Manufacturing	327993	13	3
Industrial	All Other Miscellaneous Nonmetallic Mineral Product Manufacturing	327999	2	0

(continued)

**Table A-2. Sources That May Potentially Experience Regulatory Relief under
ALTERNATIVE SCENARIO 1 (continued)**

Sector	NAICS Descriptions	NAICS	Facilities	
			Number of Facilities Subject to MACT	Number of Facilities That May Potentially Experience Regulatory Relief
Industrial	Iron and Steel Mills and Ferroalloy Manufacturing	331110	73	37
Industrial	Iron and Steel Mills^	331111	50	2
Industrial	Electrometallurgical Ferroalloy Product Manufacturing^	331112	1	0
Industrial	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel	331210	5	1
Industrial	Rolled Steel Shape Manufacturing	331221	6	1
Industrial	Primary Aluminum Production^	331312	2	0
Industrial	Alumina Refining and Primary Aluminum Production	331313	16	0
Industrial	Secondary Smelting and Alloying of Aluminum	331314	56	5
Industrial	Aluminum Sheet, Plate, and Foil Manufacturing	331315	6	1
Industrial	Aluminum Extruded Product Manufacturing^	331316	1	0
Industrial	Other Aluminum Rolling, Drawing, and Extruding	331318	2	0
Industrial	Nonferrous Metal (except Aluminum) Smelting and Refining	331410	1	0
Industrial	Primary Smelting and Refining of Copper^	331411	0	0
Industrial	Primary Smelting and Refining of Nonferrous Metal (except Copper and Aluminum)^	331419	2	0
Industrial	Copper Rolling, Drawing, Extruding, and Alloying	331420	3	0
Industrial	Copper Wire (except Mechanical) Drawing^	331422	1	0
Industrial	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, and Extruding	331491	3	0
Industrial	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	331492	2	0
Industrial	Iron Foundries	331511	59	3
Industrial	Steel Foundries (except Investment)	331513	2	0
Industrial	Aluminum Die-Casting Foundries^	331521	1	0
Industrial	Aluminum Foundries (except Die-Casting)	331524	2	0
Industrial	Nonferrous Forging	332112	1	1
Industrial	Metal Crown, Closure, and Other Metal Stamping (except Automotive)	332119	1	1
Industrial	Hand and Edge Tool Manufacturing^	332212	1	1
Industrial	Prefabricated Metal Building and Component Manufacturing	332311	1	1
Industrial	Fabricated Structural Metal Manufacturing	332312	1	1
Industrial	Metal Window and Door Manufacturing	332321	5	4
Industrial	Sheet Metal Work Manufacturing	332322	1	1

(continued)

**Table A-2. Sources That May Potentially Experience Regulatory Relief under
ALTERNATIVE SCENARIO 1 (continued)**

Sector	NAICS Descriptions	NAICS	Facilities	
			Number of Facilities Subject to MACT	Number of Facilities That May Potentially Experience Regulatory Relief
Industrial	Metal Can Manufacturing	332431	14	8
Industrial	Other Metal Container Manufacturing	332439	4	2
Industrial	Bolt, Nut, Screw, Rivet, and Washer Manufacturing	332722	1	1
Industrial	Metal Heat Treating	332811	1	1
Industrial	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers	332812	433	241
Industrial	Electroplating, Plating, Polishing, Anodizing, and Coloring	332813	3	2
Industrial	Other Fabricated Metal Manufacturing	332990	1	1
Industrial	Small Arms Ammunition Manufacturing	332992	1	1
Industrial	Ammunition (except Small Arms) Manufacturing	332993	3	2
Industrial	All Other Miscellaneous Fabricated Metal Product Manufacturing	332999	3	2
Industrial	Farm Machinery and Equipment Manufacturing	333111	8	3
Industrial	Lawn and Garden Tractor and Home Lawn and Garden Equipment Manufacturing	333112	1	0
Industrial	Construction Machinery Manufacturing	333120	64	27
Industrial	Mining Machinery and Equipment Manufacturing	333131	2	0
Industrial	Printing Machinery and Equipment Manufacturing^	333293	1	0
Industrial	Photographic and Photocopying Equipment Manufacturing	333316	1	0
Industrial	Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing	333415	1	0
Industrial	Machine Tool (Metal Cutting Types) Manufacturing^	333512	1	0
Industrial	Machine Tool (Metal Forming Types) Manufacturing^	333513	1	0
Industrial	Turbine and Turbine Generator Set Units Manufacturing	333611	1	0
Industrial	Other Engine Equipment Manufacturing	333618	5	2
Industrial	Overhead Traveling Crane, Hoist, and Monorail System Manufacturing	333923	1	0
Industrial	Welding and Soldering Equipment Manufacturing	333992	2	0
Industrial	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	334220	1	0
Industrial	Electron Tube Manufacturing^	334411	1	0

(continued)

**Table A-2. Sources That May Potentially Experience Regulatory Relief under
ALTERNATIVE SCENARIO 1 (continued)**

Sector	NAICS Descriptions	NAICS	Facilities	
			Number of Facilities Subject to MACT	Number of Facilities That May Potentially Experience Regulatory Relief
Industrial	Bare Printed Circuit Board Manufacturing	334412	1	0
Industrial	Semiconductor and Related Device Manufacturing	334413	23	11
Industrial	Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use	334512	1	0
Industrial	Blank Magnetic and Optical Recording Media Manufacturing	334613	0	0
Industrial	Electric Lamp Bulb and Part Manufacturing	335110	1	1
Industrial	Household Laundry Equipment Manufacturing	335224	13	8
Industrial	Other Major Household Appliance Manufacturing	335228	2	2
Industrial	Power, Distribution, and Specialty Transformer Manufacturing	335311	1	1
Industrial	Motor and Generator Manufacturing	335312	2	2
Industrial	Storage Battery Manufacturing	335911	1	1
Industrial	Current-Carrying Wiring Device Manufacturing	335931	1	1
Industrial	Noncurrent-Carrying Wiring Device Manufacturing	335932	1	1
Industrial	Carbon and Graphite Product Manufacturing	335991	6	4
Industrial	Automobile Manufacturing	336111	66	10
Industrial	Light Truck and Utility Vehicle Manufacturing	336112	5	2
Industrial	Heavy Duty Truck Manufacturing	336120	8	2
Industrial	Motor Vehicle Body Manufacturing	336211	8	2
Industrial	Truck Trailer Manufacturing	336212	1	0
Industrial	Motor Vehicle Gasoline Engine and Engine Parts Manufacturing	336310	2	0
Industrial	Carburetor, Piston, Piston Ring, and Valve Manufacturing^	336311	1	0
Industrial	Gasoline Engine and Engine Parts Manufacturing^	336312	3	1
Industrial	Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing	336330	2	0
Industrial	Motor Vehicle Brake System Manufacturing	336340	1	0
Industrial	Motor Vehicle Transmission and Power Train Parts Manufacturing	336350	2	0
Industrial	Motor Vehicle Seating and Interior Trim Manufacturing	336360	1	0
Industrial	Motor Vehicle Metal Stamping	336370	1	0
Industrial	Other Motor Vehicle Parts Manufacturing	336390	13	3
Industrial	All Other Motor Vehicle Parts Manufacturing^	336399	2	0

(continued)

**Table A-2. Sources That May Potentially Experience Regulatory Relief under
ALTERNATIVE SCENARIO 1 (continued)**

Sector	NAICS Descriptions	NAICS	Facilities	
			Number of Facilities Subject to MACT	Number of Facilities That May Potentially Experience Regulatory Relief
Industrial	Aircraft Manufacturing	336411	125	89
Industrial	Aircraft Engine and Engine Parts Manufacturing	336412	8	2
Industrial	Other Aircraft Parts and Auxiliary Equipment Manufacturing	336413	10	3
Industrial	Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing	336415	1	0
Industrial	Railroad Rolling Stock Manufacturing	336510	1	0
Industrial	Ship Building and Repairing	336611	92	18
Industrial	Boat Building	336612	96	16
Industrial	Military Armored Vehicle, Tank, and Tank Component Manufacturing	336992	2	0
Industrial	Wood Kitchen Cabinet and Countertop Manufacturing	337110	347	209
Industrial	Upholstered Household Furniture Manufacturing	337121	2	2
Industrial	Nonupholstered Wood Household Furniture Manufacturing	337122	14	8
Industrial	Institutional Furniture Manufacturing	337127	1	1
Industrial	Wood Office Furniture Manufacturing	337211	5	4
Industrial	Office Furniture (except Wood) Manufacturing	337214	19	11
Industrial	Showcase, Partition, Shelving, and Locker Manufacturing	337215	1	1
Industrial	Blind and Shade Manufacturing	337920	1	1
Industrial	Surgical and Medical Instrument Manufacturing	339112	2	0
Industrial	Surgical Appliance and Supplies Manufacturing	339113	1	0
Industrial	Jewelry and Silverware Manufacturing	339910	1	0
Industrial	Sporting and Athletic Goods Manufacturing	339920	1	0
Industrial	Office Supplies (except Paper) Manufacturing	339940	1	0
Industrial	Gasket, Packing, and Sealing Device Manufacturing	339991	2	0
Industrial	Burial Casket Manufacturing	339995	3	1
Industrial	All Other Miscellaneous Manufacturing	339999	5	2
Commercial	Grain and Field Bean Merchant Wholesalers	424510	1	0
Commercial	Petroleum Bulk Stations and Terminals	424710	7	2
Commercial	Scheduled Passenger Air Transportation	481111	2	0
Commercial	Line-Haul Railroads	482111	1	0
Energy	Pipeline Transportation of Crude Oil	486110	1	0
Energy	Pipeline Transportation of Natural Gas	486210	257	84
Energy	Pipeline Transportation of Refined Petroleum Products	486910	1	0

(continued)

**Table A-2. Sources That May Potentially Experience Regulatory Relief under
ALTERNATIVE SCENARIO 1 (continued)**

Sector	NAICS Descriptions	NAICS	Facilities	
			Number of Facilities Subject to MACT	Number of Facilities That May Potentially Experience Regulatory Relief
Commercial	Support Activities for Rail Transportation	488210	3	1
Commercial	Marine Cargo Handling	488320	2	0
Commercial	General Warehousing and Storage	493110	180	53
Commercial	Other Warehousing and Storage	493190	6	2
Commercial	Lessors of Nonresidential Buildings (except Miniwarehouses)	531120	1	0
Commercial	Testing Laboratories	541380	2	0
Commercial	Research and Development in the Physical, Engineering and Life Sciences (except Nanotechnology and Biotechnology)^	541715	2	0
Commercial	All Other Support Services	561990	1	0
Waste Treatment	Hazardous Waste Treatment and Disposal	562211	41	18
Waste Treatment	Solid Waste Landfill	562212	6	2
Waste Treatment	Solid Waste Combustors and Incinerators	562213	3	1
Waste Treatment	Remediation Services	562910	1	0
Educational Services	Colleges, Universities, and Professional Schools	611310	23	8
Commercial	Amusement and Theme Parks	713110	1	0
Commercial	Linen and Uniform Supply	812330	1	0
Commercial	Industrial Launderers	812332	3	1

Sources: 2012 Economic Census; Eastern Research Group. August 2020a. MM2A Database Memorandum, Documentation of the Data for Analytical Evaluations & Summary of Industries Potentially Impacted by the Final Rule “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD; Eastern Research Group. August 2020b. MM2A Cost Analysis Memorandum, Documentation of the compliance cost savings analysis for the final rulemaking “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD.

**Table A-3. Sources That May Potentially Experience Regulatory Relief under
ALTERNATIVE SCENARIO 2**

Sector	NAICS Descriptions	NAICS	Facilities	
			Number of Facilities Subject to MACT	Number of Facilities That May Potentially Experience Regulatory Relief
Agriculture	Postharvest Crop Activities (except Cotton Ginning)	115114	1	0
Energy	Crude Petroleum and Natural Gas Extraction	211111	120	57
Energy	Natural Gas Liquid Extraction	211112	26	12
Industrial	Iron Ore Mining	212210	11	0
Industrial	Lead Ore and Zinc Ore Mining	212231	1	0
Industrial	Copper Ore and Nickel Ore Mining	212234	1	0
Industrial	All Other Metal Ore Mining	212299	1	0
Industrial	Industrial Sand Mining	212322	3	0
Industrial	Kaolin and Ball Clay Mining	212324	3	0
Industrial	Potash, Soda, and Borate Mineral Mining	212391	6	0
Industrial	All Other Nonmetallic Mineral Mining	212399	1	0
Energy	Support Activities for Oil and Gas Operations	213112	3	1
Utilities	Hydroelectric Power Generation	221111	1	1
Utilities	Fossil Fuel Electric Power Generation	221112	334	100
Utilities	Biomass Electric Power Generation	221117	5	4
Utilities	Other Electric Power Generation	221118	1	1
Utilities	Other Electric Power Generation^	221119	8	6
Utilities	Electric Power Distribution	221122	1	1
Utilities	Natural Gas Distribution	221210	13	9
Utilities	Water Supply and Irrigation Systems	221310	2	2
Utilities	Sewage Treatment Facilities	221320	17	12
Utilities	Steam and Air-Conditioning Supply	221330	22	15
Industrial	Other Animal Food Manufacturing	311119	1	0
Industrial	Wet Corn Milling	311221	16	0
Industrial	Soybean Processing^	311222	16	0
Industrial	Other Oilseed Processing^	311223	5	0
Industrial	Soybean and Other Oilseed Processing	311224	116	2
Industrial	Fats and Oils Refining and Blending	311225	2	0
Industrial	Beet Sugar Manufacturing	311313	11	0
Industrial	Cane Sugar Manufacturing	311314	3	0
Industrial	Frozen Fruit, Juice, and Vegetable Manufacturing	311411	2	0
Industrial	Fruit and Vegetable Canning	311421	1	0
Industrial	Specialty Canning	311422	2	0
Industrial	Cheese Manufacturing	311513	2	0
Industrial	Dry, Condensed, and Evaporated Dairy Product Manufacturing	311514	3	0
Industrial	Rendering and Meat Byproduct Processing	311613	1	0
Industrial	Commercial Bakeries	311812	2	0

(continued)

**Table A-3. Sources That May Potentially Experience Regulatory Relief under
ALTERNATIVE SCENARIO 2 (continued)**

Sector	NAICS Descriptions	NAICS	Facilities	
			Number of Facilities Subject to MACT	Number of Facilities That May Potentially Experience Regulatory Relief
Industrial	Other Snack Food Manufacturing	311919	1	0
Industrial	Coffee and Tea Manufacturing	311920	1	0
Industrial	Flavoring Syrup and Concentrate Manufacturing	311930	1	0
Industrial	Spice and Extract Manufacturing	311942	4	0
Industrial	All Other Miscellaneous Food Manufacturing	311999	6	0
Industrial	Breweries	312120	3	1
Industrial	Distilleries	312140	1	0
Industrial	Tobacco Manufacturing	312230	1	0
Industrial	Yarn Spinning Mills^	313111	1	1
Industrial	Thread Mills^	313113	1	1
Industrial	Broadwoven Fabric Mills	313210	2	2
Industrial	Narrow Fabric Mills^	313221	1	1
Industrial	Textile and Fabric Finishing Mills	313310	1	1
Industrial	Broadwoven Fabric Finishing Mills^	313311	3	2
Industrial	Fabric Coating Mills	313320	50	32
Industrial	Tire Cord and Tire Fabric Mills^	314992	1	0
Industrial	Leather and Hide Tanning and Finishing	316110	6	5
Industrial	Sawmills	321113	61	25
Industrial	Wood Preservation	321114	3	1
Industrial	Hardwood Veneer and Plywood Manufacturing	321211	3	1
Industrial	Softwood Veneer and Plywood Manufacturing	321212	29	11
Industrial	Engineered Wood Member (except Truss) Manufacturing	321213	6	2
Industrial	Reconstituted Wood Product Manufacturing	321219	315	126
Industrial	Wood Window and Door Manufacturing	321911	4	1
Industrial	Cut Stock, Resawing Lumber, and Planing	321912	4	1
Industrial	All Other Miscellaneous Wood Product Manufacturing	321999	3	1
Industrial	Pulp Mills	322110	18	3
Industrial	Paper (except Newsprint) Mills	322121	282	14
Industrial	Newsprint Mills	322122	7	1
Industrial	Paperboard Mills	322130	36	9
Industrial	Corrugated and Solid Fiber Box Manufacturing	322211	174	68
Industrial	Paper Bag and Coated and Treated Paper Manufacturing	322220	17	3
Industrial	Coated and Laminated Paper Manufacturing^	322222	12	2
Industrial	Sanitary Paper Product Manufacturing	322291	2	0

(continued)

**Table A-3. Sources That May Potentially Experience Regulatory Relief under
ALTERNATIVE SCENARIO 2 (continued)**

Sector	NAICS Descriptions	NAICS	Facilities	
			Number of Facilities Subject to MACT	Number of Facilities That May Potentially Experience Regulatory Relief
Industrial	All Other Converted Paper Product Manufacturing	322299	1	0
Industrial	Commercial Lithographic Printing^	323110	1	1
Industrial	Commercial Printing (except Screen and Books)	323111	188	121
Industrial	Books Printing	323117	3	2
Industrial	Petroleum Refineries	324110	430	88
Industrial	Asphalt Shingle and Coating Materials Manufacturing	324122	3	0
Industrial	All Other Petroleum and Coal Products Manufacturing	324199	4	0
Industrial	Petrochemical Manufacturing	325110	597	260
Industrial	Industrial Gas Manufacturing	325120	4	1
Industrial	Synthetic Dye and Pigment Manufacturing	325130	1	0
Industrial	Inorganic Dye and Pigment Manufacturing^	325131	3	1
Industrial	Synthetic Organic Dye and Pigment Manufacturing^	325132	2	0
Industrial	Other Basic Inorganic Chemical Manufacturing	325180	10	3
Industrial	Alkalies and Chlorine Manufacturing^	325181	4	1
Industrial	Carbon Black Manufacturing^	325182	21	8
Industrial	All Other Basic Inorganic Chemical Manufacturing^	325188	93	5
Industrial	Cyclic Crude and Intermediate Manufacturing^	325192	1	0
Industrial	Ethyl Alcohol Manufacturing	325193	7	3
Industrial	Cyclic Crude, Intermediate, and Gum and Wood Chemical Manufacturing	325194	2	0
Industrial	All Other Basic Organic Chemical Manufacturing	325199	77	28
Industrial	Plastics Material and Resin Manufacturing	325211	857	341
Industrial	Synthetic Rubber Manufacturing	325212	22	2
Industrial	Artificial and Synthetic Fibers and Filaments Manufacturing	325220	6	2
Industrial	Cellulosic Organic Fiber Manufacturing^	325221	1	0
Industrial	Noncellulosic Organic Fiber Manufacturing^	325222	4	1
Industrial	Nitrogenous Fertilizer Manufacturing	325311	16	6
Industrial	Phosphatic Fertilizer Manufacturing	325312	30	3
Industrial	Pesticide and Other Agricultural Chemical Manufacturing	325320	22	6
Industrial	Medicinal and Botanical Manufacturing	325411	4	1
Industrial	Pharmaceutical Preparation Manufacturing	325412	36	11
Industrial	Biological Product (except Diagnostic) Manufacturing	325414	1	0

(continued)

**Table A-3. Sources That May Potentially Experience Regulatory Relief under
ALTERNATIVE SCENARIO 2 (continued)**

Sector	NAICS Descriptions	NAICS	Facilities	
			Number of Facilities Subject to MACT	Number of Facilities That May Potentially Experience Regulatory Relief
Industrial	Paint and Coating Manufacturing	325510	48	26
Industrial	Adhesive Manufacturing	325520	4	1
Industrial	Surface Active Agent Manufacturing	325613	2	0
Industrial	Toilet Preparation Manufacturing	325620	2	0
Industrial	Explosives Manufacturing	325920	2	0
Industrial	Custom Compounding of Purchased Resins	325991	5	2
Industrial	Photographic Film, Paper, Plate, and Chemical Manufacturing	325992	4	1
Industrial	All Other Miscellaneous Chemical Product and Preparation Manufacturing	325998	10	3
Industrial	Plastics Packaging Film and Sheet (including Laminated) Manufacturing	326112	5	4
Industrial	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing	326113	16	8
Industrial	Unlaminated Plastics Profile Shape Manufacturing	326121	12	1
Industrial	Plastics Pipe and Pipe Fitting Manufacturing	326122	1	1
Industrial	Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing	326130	7	4
Industrial	Polystyrene Foam Product Manufacturing	326140	1	1
Industrial	Urethane and Other Foam Product (except Polystyrene) Manufacturing	326150	19	16
Industrial	Plastics Plumbing Fixture Manufacturing	326191	2	2
Industrial	All Other Plastics Product Manufacturing	326199	148	81
Industrial	Tire Manufacturing (except Retreading)	326211	39	23
Industrial	Rubber and Plastics Hoses and Belting Manufacturing	326220	6	4
Industrial	Rubber Product Manufacturing for Mechanical Use	326291	2	2
Industrial	All Other Rubber Product Manufacturing	326299	14	6
Industrial	Pottery, Ceramics, and Plumbing Fixture Manufacturing	327110	4	3
Industrial	Clay Building Material and Refractories Manufacturing	327120	76	57
Industrial	Clay Refractory Manufacturing [^]	327124	8	4
Industrial	Flat Glass Manufacturing	327211	2	2
Industrial	Other Pressed and Blown Glass and Glassware Manufacturing	327212	17	11
Industrial	Cement Manufacturing	327310	6	4
Industrial	Lime Manufacturing	327410	38	2
Industrial	Gypsum Product Manufacturing	327420	1	1
Industrial	Abrasive Product Manufacturing	327910	4	2
Industrial	Mineral Wool Manufacturing	327993	13	6

(continued)

**Table A-3. Sources That May Potentially Experience Regulatory Relief under
ALTERNATIVE SCENARIO 2 (continued)**

Sector	NAICS Descriptions	NAICS	Facilities	
			Number of Facilities Subject to MACT	Number of Facilities That May Potentially Experience Regulatory Relief
Industrial	All Other Miscellaneous Nonmetallic Mineral Product Manufacturing	327999	2	2
Industrial	Iron and Steel Mills and Ferroalloy Manufacturing	331110	73	44
Industrial	Iron and Steel Mills^	331111	50	3
Industrial	Electrometallurgical Ferroalloy Product Manufacturing^	331112	1	0
Industrial	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel	331210	5	2
Industrial	Rolled Steel Shape Manufacturing	331221	6	2
Industrial	Primary Aluminum Production^	331312	2	0
Industrial	Alumina Refining and Primary Aluminum Production	331313	16	2
Industrial	Secondary Smelting and Alloying of Aluminum	331314	56	8
Industrial	Aluminum Sheet, Plate, and Foil Manufacturing	331315	6	2
Industrial	Aluminum Extruded Product Manufacturing^	331316	1	0
Industrial	Other Aluminum Rolling, Drawing, and Extruding	331318	2	0
Industrial	Nonferrous Metal (except Aluminum) Smelting and Refining	331410	1	0
Industrial	Primary Smelting and Refining of Copper^	331411	0	0
Industrial	Primary Smelting and Refining of Nonferrous Metal (except Copper and Aluminum)^	331419	2	0
Industrial	Copper Rolling, Drawing, Extruding, and Alloying	331420	3	0
Industrial	Copper Wire (except Mechanical) Drawing^	331422	1	0
Industrial	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, and Extruding	331491	3	1
Industrial	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	331492	2	0
Industrial	Iron Foundries	331511	59	4
Industrial	Steel Foundries (except Investment)	331513	2	0
Industrial	Aluminum Die-Casting Foundries^	331521	1	0
Industrial	Aluminum Foundries (except Die-Casting)	331524	2	0
Industrial	Nonferrous Forging	332112	1	1
Industrial	Metal Crown, Closure, and Other Metal Stamping (except Automotive)	332119	1	1

(continued)

**Table A-3. Sources That May Potentially Experience Regulatory Relief under
ALTERNATIVE SCENARIO 2 (continued)**

Sector	NAICS Descriptions	NAICS	Facilities	
			Number of Facilities Subject to MACT	Number of Facilities That May Potentially Experience Regulatory Relief
Industrial	Hand and Edge Tool Manufacturing^	332212	1	1
Industrial	Prefabricated Metal Building and Component Manufacturing	332311	1	1
Industrial	Fabricated Structural Metal Manufacturing	332312	1	1
Industrial	Metal Window and Door Manufacturing	332321	5	5
Industrial	Sheet Metal Work Manufacturing	332322	1	1
Industrial	Metal Can Manufacturing	332431	14	11
Industrial	Other Metal Container Manufacturing	332439	4	3
Industrial	Bolt, Nut, Screw, Rivet, and Washer Manufacturing	332722	1	1
Industrial	Metal Heat Treating	332811	1	1
Industrial	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers	332812	433	332
Industrial	Electroplating, Plating, Polishing, Anodizing, and Coloring	332813	3	3
Industrial	Other Fabricated Metal Manufacturing	332990	1	1
Industrial	Small Arms Ammunition Manufacturing	332992	1	1
Industrial	Ammunition (except Small Arms) Manufacturing	332993	3	3
Industrial	All Other Miscellaneous Fabricated Metal Product Manufacturing	332999	3	3
Industrial	Farm Machinery and Equipment Manufacturing	333111	8	3
Industrial	Lawn and Garden Tractor and Home Lawn and Garden Equipment Manufacturing	333112	1	0
Industrial	Construction Machinery Manufacturing	333120	64	30
Industrial	Mining Machinery and Equipment Manufacturing	333131	2	0
Industrial	Printing Machinery and Equipment Manufacturing^	333293	1	0
Industrial	Photographic and Photocopying Equipment Manufacturing	333316	1	0
Industrial	Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing	333415	1	0
Industrial	Machine Tool (Metal Cutting Types) Manufacturing^	333512	1	0
Industrial	Machine Tool (Metal Forming Types) Manufacturing^	333513	1	0
Industrial	Turbine and Turbine Generator Set Units Manufacturing	333611	1	0
Industrial	Other Engine Equipment Manufacturing	333618	5	2

(continued)

**Table A-3. Sources That May Potentially Experience Regulatory Relief under
ALTERNATIVE SCENARIO 2 (continued)**

Sector	NAICS Descriptions	NAICS	Facilities	
			Number of Facilities Subject to MACT	Number of Facilities That May Potentially Experience Regulatory Relief
Industrial	Electron Tube Manufacturing^	334411	1	0
Industrial	Bare Printed Circuit Board Manufacturing	334412	1	0
Industrial	Semiconductor and Related Device Manufacturing	334413	23	15
Industrial	Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use	334512	1	0
Industrial	Blank Magnetic and Optical Recording Media Manufacturing	334613	0	0
Industrial	Electric Lamp Bulb and Part Manufacturing	335110	1	1
Industrial	Household Laundry Equipment Manufacturing	335224	13	9
Industrial	Other Major Household Appliance Manufacturing	335228	2	2
Industrial	Power, Distribution, and Specialty Transformer Manufacturing	335311	1	1
Industrial	Motor and Generator Manufacturing	335312	2	2
Industrial	Storage Battery Manufacturing	335911	1	1
Industrial	Current-Carrying Wiring Device Manufacturing	335931	1	1
Industrial	Noncurrent-Carrying Wiring Device Manufacturing	335932	1	1
Industrial	Carbon and Graphite Product Manufacturing	335991	6	4
Industrial	Automobile Manufacturing	336111	66	28
Industrial	Light Truck and Utility Vehicle Manufacturing	336112	5	4
Industrial	Heavy Duty Truck Manufacturing	336120	8	5
Industrial	Motor Vehicle Body Manufacturing	336211	8	5
Industrial	Truck Trailer Manufacturing	336212	1	1
Industrial	Motor Vehicle Gasoline Engine and Engine Parts Manufacturing	336310	2	2
Industrial	Carburetor, Piston, Piston Ring, and Valve Manufacturing^	336311	1	1
Industrial	Gasoline Engine and Engine Parts Manufacturing^	336312	3	2
Industrial	Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing	336330	2	2
Industrial	Motor Vehicle Brake System Manufacturing	336340	1	1
Industrial	Motor Vehicle Transmission and Power Train Parts Manufacturing	336350	2	2
Industrial	Motor Vehicle Seating and Interior Trim Manufacturing	336360	1	1
Industrial	Motor Vehicle Metal Stamping	336370	1	1
Industrial	Other Motor Vehicle Parts Manufacturing	336390	13	7

(continued)

**Table A-3. Sources That May Potentially Experience Regulatory Relief under
ALTERNATIVE SCENARIO 2 (continued)**

Sector	NAICS Descriptions	NAICS	Facilities	
			Number of Facilities Subject to MACT	Number of Facilities That May Potentially Experience Regulatory Relief
Industrial	All Other Motor Vehicle Parts Manufacturing^	336399	2	2
Industrial	Aircraft Manufacturing	336411	125	107
Industrial	Aircraft Engine and Engine Parts Manufacturing	336412	8	5
Industrial	Other Aircraft Parts and Auxiliary Equipment Manufacturing	336413	10	6
Industrial	Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing	336415	1	1
Industrial	Railroad Rolling Stock Manufacturing	336510	1	1
Industrial	Ship Building and Repairing	336611	92	67
Industrial	Boat Building	336612	96	35
Industrial	Military Armored Vehicle, Tank, and Tank Component Manufacturing	336992	2	2
Industrial	Wood Kitchen Cabinet and Countertop Manufacturing	337110	347	263
Industrial	Upholstered Household Furniture Manufacturing	337121	2	2
Industrial	Nonupholstered Wood Household Furniture Manufacturing	337122	14	11
Industrial	Institutional Furniture Manufacturing	337127	1	1
Industrial	Wood Office Furniture Manufacturing	337211	5	5
Industrial	Office Furniture (except Wood) Manufacturing	337214	19	17
Industrial	Showcase, Partition, Shelving, and Locker Manufacturing	337215	1	1
Industrial	Blind and Shade Manufacturing	337920	1	1
Industrial	Surgical and Medical Instrument Manufacturing	339112	2	0
Industrial	Surgical Appliance and Supplies Manufacturing	339113	1	0
Industrial	Jewelry and Silverware Manufacturing	339910	1	0
Industrial	Sporting and Athletic Goods Manufacturing	339920	1	0
Industrial	Office Supplies (except Paper) Manufacturing	339940	1	0
Industrial	Gasket, Packing, and Sealing Device Manufacturing	339991	2	0
Industrial	Burial Casket Manufacturing	339995	3	1
Industrial	All Other Miscellaneous Manufacturing	339999	5	2
Commercial	Grain and Field Bean Merchant Wholesalers	424510	1	0
Commercial	Petroleum Bulk Stations and Terminals	424710	7	3
Commercial	Scheduled Passenger Air Transportation	481111	2	0
Commercial	Line-Haul Railroads	482111	1	0

(continued)

**Table A-3. Sources That May Potentially Experience Regulatory Relief under
ALTERNATIVE SCENARIO 2 (continued)**

Sector	NAICS Descriptions	NAICS	Facilities	
			Number of Facilities Subject to MACT	Number of Facilities That May Potentially Experience Regulatory Relief
Energy	Pipeline Transportation of Crude Oil	486110	1	0
Energy	Pipeline Transportation of Natural Gas	486210	257	123
Energy	Pipeline Transportation of Refined Petroleum Products	486910	1	0
Commercial	Support Activities for Rail Transportation	488210	3	1
Commercial	Marine Cargo Handling	488320	2	0
Commercial	General Warehousing and Storage	493110	180	65
Commercial	Other Warehousing and Storage	493190	6	2
Commercial	Lessors of Nonresidential Buildings (except Miniwarehouses)	531120	1	0
Commercial	Testing Laboratories	541380	2	0
Commercial	Research and Development in the Physical, Engineering and Life Sciences (except Nanotechnology and Biotechnology)^^	541715	2	0
Commercial	All Other Support Services	561990	1	0
Waste Treatment	Hazardous Waste Treatment and Disposal	562211	41	27
Waste Treatment	Solid Waste Landfill	562212	6	4
Waste Treatment	Solid Waste Combustors and Incinerators	562213	3	2
Waste Treatment	Remediation Services	562910	1	1
Educational Services	Colleges, Universities, and Professional Schools	611310	23	11
Commercial	Amusement and Theme Parks	713110	1	0
Commercial	Linen and Uniform Supply	812330	1	0
Commercial	Industrial Launderers	812332	3	1

Sources: 2012 Economic Census; Eastern Research Group. August 2020a. MM2A Database Memorandum, Documentation of the Data for Analytical Evaluations & Summary of Industries Potentially Impacted by the Final Rule “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD; Eastern Research Group. August 2020b. MM2A Cost Analysis Memorandum, Documentation of the compliance cost savings analysis for the final rulemaking “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”. Memorandum for U.S. EPA/OAQPS/SPPD.

ATTACHMENT B

SUMMARY OF METHODOLOGY AND DATA USED TO REVIEW RECLASSIFICATIONS

As described in the Emission Impact Analysis Technical Support Memorandum, the EPA and ERG reviewed the reclassification of 69 sources that as of May 2020 had reclassified to area source status or were in the process of reclassifying to area source status since the release of the Wehrum memorandum in January 2018. Below we summarize the analysis of reclassifications. This analysis is purely illustrative in nature and does not serve as an analysis of emissions impacts for all source categories affected by the final rule.

At proposal, to assess the potential environmental impact associated with the reclassification of sources, the EPA evaluated information from 34 sources that had reclassified to area source status consistent with the EPA's plain language reading of the CAA section 112 definitions of "major" and "area" source since January 2018. The review of these reclassifications provided a representation of the potential real-world impact on emissions by looking at the facts and circumstances of actual reclassification actions. In addition to the evaluation of the reclassification actions, at proposal the EPA also performed an illustrative assessment for six source categories: Wood Furniture Manufacturing Operations, Surface Coating of Metal Cans, Surface Coating of Miscellaneous Metal Parts and Products, Wet-Formed Fiberglass Mat Production, Hydrochloric Acid (HCl) Production, and Non-Gasoline Organic Liquids Distribution (OLD). The analysis of these six source categories was informative in some respects but is only illustrative and speculative in nature and can only present a range of possible outcomes that is dependent on the assumptions that we made in the assessment. The EPA received numerous comments on the emission analyses presented at proposal. Many commenters argued that the EPA had failed to adequately assess the effects of the rule on HAP emissions and did not perform any health impact analysis. These commenters argued the EPA did not include enough source categories in the emission analysis at proposal to draw reasonable conclusions. Commenters also opined that the analysis of the actual reclassifications relies on a small sample, and a few speculated that we had "cherry picked" permits to review.

For the final rule, the EPA expanded the review of reclassification actions to include the review of 35 additional reclassifications received from March 2019 through February 2020. This allowed us to more than double the number of reclassifications reviewed for the final rule. The details and results of the analysis of 769 reclassification actions are summarized below and are presented in extensive detail in the review of reclassifications technical support memorandum for

the final rule, which is available in the docket for this action.⁵⁹ The EPA received comments on the permit review completed for the proposal; we have considered the input from commenters in the review of the reclassifications included in the final analysis.

To assess the potential for emission impacts due to reclassification, the EPA focused the review on the enforceable conditions associated with the PTE limitations for the emission units previously subject to major source NESHAP requirements. The EPA review focused on whether the emission units previously subject to major source NESHAP requirements continue to have enforceable conditions that are either the same as or consistent with the previous applicable major source NESHAP compliance obligations. Summaries of the permit reviews and emissions evaluations are presented in the Review of Reclassification Actions TSM available in the docket for this action.

The use of add-on control equipment is one of the compliance options sources can use to comply with major source NESHAP requirements. In general, sources that comply using add-on controls demonstrate compliance by meeting certain operating limits/parameters established during performance tests. For sources relying on emission control equipment, EPA focused the review on those sources that used “adjustable” emission control equipment as the compliance method for previously applicable major source NESHAP requirements. Adjustable controls are those for which important operating parameters (e.g., combustion temperature) can be potentially adjusted, which could lead to a change in the HAP emission control level. For our analysis, we viewed particulate controls for inorganic HAP (e.g., fabric filters, electrostatic precipitators) as non-adjustable, but controls for organic HAP or acid gases (e.g., regenerative thermal oxidizers [RTOs], caustic scrubbers, wet scrubbers) as controls that could be adjustable.

For sources employing adjustable emission controls, the EPA reviewed the permit enforceable limitations associated with using the emission control, including operating parameters.

If the permit conditions reflect the use of the same control equipment and operating parameters as when the source was subject to major source NESHAP requirements, the EPA assumed no potential for emissions increases due to the reclassification. If permit conditions reflect the use of the same control equipment but a change in operating parameters (e.g., change in monitoring device, change in monitoring frequency), the EPA assessed whether the change in

⁵⁹ See Technical Support Memorandum (TSM): Review of Reclassification Actions for the Final Rulemaking “Reclassification of Major Sources as Area Sources under Section 112 of the Clean Air Act” available in the docket of this rulemaking. August 2020.

operating parameters could lead to a change in HAP emission control level and an increase of HAP emissions. The use of work practices is another form of compliance that is used for some major source NESHAP requirements. For sources employing work practices, the EPA focused on whether the work practice requirements previously applicable to the source changed when the source reclassified. If the permit conditions reflect the same work practice requirements, the EPA assumed no potential for emissions increases due to the reclassification. If the permit conditions reflect a change in the work practice requirements, the EPA assessed whether the change could lead to a change in the HAP emission control level and an increase of HAP emissions.

When reclassifying, a source can opt to operate with new operational limitations, which are incorporated into their operating permit, to avoid applicability to major source NESHAP requirements. For these types of reclassifications, the EPA assessed whether these new operational restrictions will lead to additional emission reductions.

Many sources have made permanent process changes and have reclassified as true area sources (HAP PTE is below the MST and source does not rely on any physical or operational limits, including the use of pollution control equipment to constrain their emissions). The EPA determined that the reclassification of such sources will not lead to emissions increases.

Based on the analysis described above, the EPA's findings from the review of reclassification actions and emission evaluation are that sources that had reclassified to area source status, in most cases, achieved and maintain area source status by operating the emission controls or continuing to implement the practices they used to comply with the major source NESHAP requirements, and we expect no emission increases due to reclassification for these sources. While some permitting authorities could allow for changes in the enforceable conditions or practices the sources used to comply with major source NESHAP requirements, this happened for only one source or 1.4 percent of the actual reclassifications. Below is an overview of the EPA's findings from the permit review and evaluation for 69 reclassifications.

Of the 69 sources that have reclassified, 46 sources are of a coating type source category, 11 are chemical sources, six are fuel combustion/boiler sources, five are oil and gas sources, and two are heavy industry. (*See* Tables 3 and 4 of the Review of Reclassification Actions TSM available in the docket for this action.) Of the 69 reclassifications reviewed, 14 sources are now classified as true area sources because these sources are no longer physically or operationally able to emit HAP above the MST. Of the 56 sources with enforceable PTE limitations, 18 sources had obtained enforceable PTE limitations before January 2018 (existing PTE limitations), while 38 obtained the PTE limitations after January 2018 (i.e., new PTE

limitations). A majority of these 69 sources are in coatings source categories. For these sources, the use of compliant materials is one of the compliance options sources use to comply with many major source NESHAP requirements. This compliance method is more prevalent for coating source NESHAP categories. In general, sources comply by applying materials that meet the emission limits, either individually or collectively, during each compliance period. Sources demonstrate compliance by showing that the organic HAP content of each coating/thinner/additive/resin used is less than or equal to the applicable limitation.

A discussion with the EPA's coatings source experts indicated that a source that reclassifies to area source status after being in compliance with major source NESHAP requirements through the use of compliant materials is highly unlikely to change their formulations from a low- or no-HAP content to a higher HAP content (e.g., switching from powder coatings back to liquid coatings). This change is unlikely because a change to higher HAP content formulation could also lead to an increase in VOC emissions, to applicability of VOC and OSHA regulations, and to an increase in costs associated with the disposal of the hazardous waste. In addition, many facilities have made substantive process changes to incorporate the use of the low-HAP/no-HAP coatings. These facilities would incur substantial costs to change their operations to use higher HAP coatings.

Thus, the EPA does not expect that sources that have employed the use of pollution prevention measures (*i.e.*, low-HAP/no-HAP coatings or no-HAP coatings/resins) as their compliance method to meet previous applicable major source NESHAP requirements and have reformulated their products accordingly will change their formulations and products as a result of a change in status.

For these types of sources, if permits reflect the use of compliant materials (*i.e.*, low-HAP or no-HAP coatings/resins) as the method of compliance with the PTE limitations, the EPA assumed no potential for emissions increases due directly to the reclassification. However, if the post-reclassification permit reflected a change in the use of compliant materials, the EPA analyzed whether such change could lead to emission increases that otherwise would have not happened if the source continued to be subject to major source NESHAP requirements.

Of the 45 coating sources, 32 used compliant materials (low-HAP/no-HAP) to meet applicable major source requirements before reclassification, and their continued use of compliant materials is an enforceable condition after reclassification. Seven other coating sources relied exclusively on compliant materials before reclassifying, while after reclassifying they relied on both compliant materials and a change in operations and/or production limits to

maintain compliance. Four sources used a combination of compliant materials and control technology (RTOs or total enclosures) to meet applicable major source requirements and maintain enforceable conditions requiring the operation of the RTOs after reclassification. One source used an RTO and work practice standards to meet applicable major source requirements and maintain compliance before and after reclassifying without also relying on compliant materials. As described in detail in the TSM, the EPA does not expect emission increases from these sources due to reclassification to area source status. Finally, one source used compliant materials to meet applicable major source requirements but after reclassification requested a change to use a HAP-containing formulation with accompanying process limitations to maintain area source status. Had the change in formulation happened while the source was a major source, the source would have had to comply with the applicable NESHAP using an add-on control device. For this source, the change in formulation after reclassification could lead to emission increases of 4.3 tpy of xylene or 18.75 tpy of combined HAP.

Of the 11 chemical sources reviewed, four sources are miscellaneous organic chemical manufacturing facilities; these relied on a variety of control technologies (including RTOs, scrubbers, and flares) and work practices to maintain compliance before reclassifying and continue to have enforceable conditions requiring the control technologies after reclassification. Three sources are gasoline distribution sources that relied on vapor collection and vapor flare/vapor combustion to meet applicable major source requirements before reclassification, and these controls are enforceable conditions to maintain compliance after reclassification. Three sources are off-site waste recovery facilities that relied on control technologies such as vapor balance/recovery systems, condensers, and scrubbers to meet applicable major source requirements before reclassification. All these sources continue to rely on the same (or additional) requirements as enforceable conditions to maintain compliance after reclassification. Finally, one source is a former hazardous waste combustor and cement facility that until 2015 fueled its cement kiln using collected hazardous and non-hazardous waste, using various control technologies to maintain compliance. This facility permanently removed all equipment associated with Portland cement manufacturing and took on a new primary role as a hazardous waste storage/transfer facility, using throughput limits and a carbon adsorption system to maintain compliance.

Of the six combustion/boiler sources reviewed, four made permanent operational changes (ceased combustion of coal and/or ceased operation of boilers), allowing the sources to reclassify to area source status. Another source had material and operational limitations prior to reclassification, both of which continue to be enforceable conditions after reclassification, and

one source took additional operational restrictions on the usage of natural gas as the mechanism to constrain their emissions and PTE and reclassify to area source status. Three sources of these sources had emissions above MST before reclassifying; the reclassification of these three sources resulted in a HAP reduction of 56.9 tpy single HAP and 78.8 tpy total HAP.

All five oil and gas production and transmission sources reviewed relied on the use of control technologies (oxidation catalyst [enclosed combustion device] and flares) to meet applicable major source requirements before reclassification, and their continued use is an enforceable condition to maintain compliance after reclassification. One of these sources took additional restrictions on the amount of gas vented to the atmosphere to reclassify to area source status. Also, the reclassification of this facility prevented additional emissions that would have occurred if the source had remained a major source. As described in detail in the Review of Reclassifications Actions TSM, the EPA does not expect emission increases from these sources due to reclassification to area source status.

Of the two heavy industry sources reviewed, one is a lime manufacturing plant and the other is a flexible polyurethane foam fabrication facility. The lime manufacturing facility, after reclassification, remains subject to other regulatory requirements, including PM emission limitations, the use of a baghouse, and monitored opacity as an operating limit via operation of a continuous opacity monitoring system. The flexible polyurethane foam fabrication facility relied on compliant materials, control technology (carbon adsorption systems), work practices, and operational limitations to meet applicable major source standards before reclassification and continues to rely on these as enforceable conditions to maintain compliance after reclassification. See the Review of Reclassification Actions TSM available in the docket for the detailed permit reviews and emission evaluations.

ATTACHMENT C
ESTIMATES USED FOR CALCULATING POTENTIAL
CONTROL COSTS FOR THE ILLUSTRATIVE
125 PERCENT SCENARIO COST ANALYSIS

C.1 Organic Liquid Distribution (OLD) Annual Cost Analysis Details

The capital costs were annualized at an interest rate of 5 percent, which was within the range of rates that represent the bank prime rate as of October 2019. The equipment life for control measures, practices, and technologies included in the compliance cost analysis ranges from 4 to 15 years. Half of the annualized costs including product recovery are due to the requirement on transfer racks (i.e., 240-hour exemption removal), while the other half are due to requirements on storage tanks and flares.

The operation and maintenance (O&M) costs for storage tanks include labor costs for installing controls to reduce volume applicability thresholds and degassing during startup, shutdown, and maintenance (SSM); the capital costs include those for materials needed as part of controls for storage tanks. For flares, the O&M costs include labor needed for operation of flare monitoring; the capital costs are those for purchase of necessary monitors. For transfer racks, the O&M costs are those for operation of combustion controls, while control devices are undergoing maintenance (i.e., elimination of exception from control during maintenance). There are no capital costs associated with the operation of these combustion controls. These costs are summarized in Table C-1.

Table C-1. Nationwide Cost Impacts of Final OLD Amendments (2016\$)

Affected Source	Total Capital Cost (million \$)	Million \$/yr			
		Total Annualized Operation & Maintenance	Total Annualized Cost without Product Recovery ^a	Product Recovery Credit	Total Annualized Cost with Product Recovery
Tanks	2.28	0.42	0.71	0.17	0.54
Flares	0.19	0.34	0.36	-	0.36
Transfer Racks	0.0	0.89	0.89	-	0.89
Total ^a	2.47	1.64	1.95	0.17	1.78

^a The total annualized costs are expected to be incurred starting in 2020 and continuing over the life of the capital equipment and practices included in the cost analysis (varying from 4 to 15 years). Totals may not sum due to rounding conventions.

C.2 Wood Furniture Annual Cost Details

The annual costs used in the potential cost impacts in the illustrative 125 percent analysis are those for a switch to a low formaldehyde coating system. The costs below are taken from the

cost memo for the Wood Furniture RTR proposed in 2010. The costs estimates are based on a number of analyses done by different regulatory agencies.

C.2.1 Bay Area Air Quality Management District (BAAQMD)

On July 29, 2010, the BAAQMD met to review Regulation 8, Rule 32: Wood Products Coatings, which regulates VOC emissions from the wood products manufacturing industry by setting standards for application techniques and the amount of VOCs in coatings that can be used in surface preparation, coatings application, and cleanup for the manufacture of wood products, including furniture, bathroom vanities, kitchen cabinets, picture frames, outdoor speakers, architectural millwork, and other wood products.

The proposed amendments to Rule 8-32 reduce VOC limits for some types of coatings used on the three types of wood products subject to VOC limitations in the rule: general wood products; wood furniture, custom cabinetry and custom architectural millwork; and custom furniture. The lower VOC limits became effective July 1, 2010, and provided for alternative standards for each type of high-solids coating based on grams VOC per gram of coating solid.

The proposed BAAQMD amendments reduce VOC emissions by at least 0.45 tons per day, representing a 30 percent reduction in current emissions. The most significant costs of implementation are higher coating costs. A few manufacturers would need to add additional drying trays or ventilation during damp and cool winter months. The cost-effectiveness of the proposed amendments is estimated to range in costs from \$7,000 to \$26,000 per ton of VOC reduced, \$7,000 to \$22,000 per ton depending on the costs of new coatings only, and up to \$26,000 if additional drying facilities are required.

The Board determined that a VOC cost-effectiveness of \$15,000 per ton was within a reasonable range to be acceptable.⁶⁰

⁶⁰ The EPA notes that while some of the cost effectiveness values used in this analysis are above the range that we have typically found to be cost effective, an individual source's circumstances may result in higher or lower cost-effectiveness values that, while sometimes serving as decision-making tools for EPA analyses, may not serve as a key consideration for facilities when determining to reduce emissions. We employ the values in this analysis to illustrate the potential costs of reducing emissions to a level below the MST. This illustration assumes that if sources find a particular annual cost value to be lower than the potential gains they may accrue as a result of reclassification, then they will adopt the value per ton. The metric that sources are likely to use for a determination of whether they should install controls to reduce emissions in order to reclassify is *cost per dollar saved*, or the break-even value at which the financial benefits from reclassification will exceed costs.

C.2.2 Wood Furniture Risk Assessment Cost Analyses

Multiple control cost options were evaluated for wood furniture operations. The options include the use of add-on control equipment and the use of lower volatile (VHAP) coatings. All of the costs were based on the two cost analyses in Parts I and II of this memo. This section explains how the analyses were adapted for the two different kinds of control.

A. Regenerative Thermal Oxidizer (RTO)

Based on the cost analysis for MasterBrand Cabinets in Ferdinand, Indiana, the only add-on control that was considered potentially applicable for wood furniture operations was the regenerative thermal oxidizer. All other add-on control options are not compatible with wood furniture coatings or emission characteristics.

Two types of coating operations were evaluated for add-on control equipment. The first type of operation is more automated with steady coating rates. This type of operation is less common in wood furniture manufacturing. At this time, only three wood furniture manufacturing facilities are controlled by RTO. For our cost analysis, we assumed the operations include all three spray booth options, using a weighted average based on the amount of VOC removed.

The second type of operations is less automated and more intermittent. This type of operation is more common in wood furniture manufacturing. For that analysis, we assumed the operations would most closely resemble the intermittent operations from the touch-up booths.

The cost analyses needed a few changes to work for the risk analysis. First, the MasterBrand Cabinets analysis was based on VOC. Second, the costs are based on 2003 dollars.

The amount of VHAP was estimated based on EPA's Toxics Release Inventory. In 2003, 54 percent of the MasterBrand Cabinets VOC emissions were classified as VHAP. The Marshall and Swift Index was used to convert the costs in 2003 to a 2010 basis. In 2003, the Index was 1,123.6, and 1,515.1 in the first quarter of 2010.

B. Compliant Coatings

Based on the cost analysis by the Bay Area Air Quality Management District, this analysis is for the cost of lower VOC coatings, assuming that the NESHAP was revised to match the requirements of Regulation 8-32. These lower VOC limits for wood furniture are shown as Table 3.

The only update that was required for the analysis was to convert the VOC to VHAP. In terms of VOC, the cost-effectiveness was determined to be about \$20,000/ton VOC. Based on EPA case studies, VOC content of wood furniture coatings is typically 50 percent HAPs, so \$10,000/ton VOC converts to approximately \$20,000/ton VHAP.

Additional work practice standards were also evaluated. Work practice standards include cleaning up spills as soon as possible and keeping containers of volatile materials closed when not being used. The reduction in emissions is low and costs are difficult to estimate. The complete control cost analysis for wood furniture operations is shown in Table 5.

C. Conclusions

Overall, the annual costs for wood furniture control options range from \$589,000 to \$1.7 million, and VHAP reductions range from 9 to 128 tons per year of VHAP. These estimates lead to cost-effectiveness from \$20,000 per ton of VHAP to \$65,000 per ton of VHAP.⁶¹

C.2.3 Miscellaneous Organic Chemical Manufacturing (MON) Annual Cost Details

The total capital and annual costs are associated with the new requirements in the MON final rule for flares, equipment leaks, pressure relief devices (PRDs), heat exchange systems, maintenance vents, storage tank degassing activities, and recordkeeping and reporting. More detailed information on these costs is below.

For flares, the costs include hydrogen analyzers, calorimeters, flare gas flow monitors, steam controls/flow monitors, air controls/flow monitors, natural gas costs, steam costs, flare management plans, and root cause/corrective action analysis. The equipment life is assumed to be 15 years. The initial set-up cost for a flare management plan is estimated to cost \$7,400, which was annualized over 15 years, and each root cause/corrective action analysis is estimated to cost \$1,020. These annual costs apply to facilities that operate flares that control ethylene oxide emissions and/or flares used to control emissions from processes that produce olefins and polyolefins.

⁶¹ The EPA notes that while some of the cost effectiveness values used in this analysis are above the range that we have typically found to be cost effective, an individual source's circumstances may result in higher or lower cost-effectiveness values that, while sometimes serving as decision-making tools for EPA analyses, may not serve as a key consideration for facilities when determining to reduce emissions. We employ the values in this analysis to illustrate the potential costs of reducing emissions to a level below the MST. This illustration assumes that if sources find a particular annual cost value to be lower than the potential gains they may accrue as a result of reclassification, then they will adopt the value per ton. The metric that sources are likely to use for a determination of whether they should install controls to reduce emissions in order to reclassify is *cost per dollar saved*, or the break-even value at which the financial benefits from reclassification will exceed costs.

For MON sources without ethylene oxide controls, there is additional cost for equipment leaks. Costs include monthly monitoring of LL pumps at a leak definition of 1,000 ppm instead of 10,000 ppm for batch processes. Because we did not have data to identify facilities with only continuous or only batch processes, costs were spread across all facilities. Costs are for initial and continuous pump repair for new monitoring leak rates. The equipment life is assumed to be 5 years for pumps seals.

Equipment leak emission reductions from the controls result in chemicals in process lines not leaking and chemicals not being lost. A recovery credit of \$900 per ton VOC was applied to the VOC emission reductions in the analyses to calculate the savings in chemicals not being emitted due to the equipment leak requirements. The \$900 per ton recovery credit has historically been used by the EPA to represent the variety of chemicals that are used as reactants and produced at synthetic organic chemical manufacturing (SOCMI) facilities (U.S. EPA, 2007).

For PRDs, costs include implementation of three prevention measures per PRD, root cause/corrective action analysis per release event, and PRD monitoring. The equipment life is assumed to be 15 years.

For heat exchange systems, costs reflect the use of the Modified El Paso Method and repair of leaks of total strippable hydrocarbon concentration (as methane) in the stripping gas of 6.2 ppmv or greater. The costs estimates are based on a 5-year useful life of a quality assurance plan and/or a monitor.

Emission reductions due to application of the El Paso method result in chemicals in process lines not leaking into the heat exchange system and not being lost. A recovery credit of \$900 per ton VOC was applied to the VOC emission reductions in the analyses to calculate the savings in those chemicals not being emitted.

For maintenance/equipment openings, costs include (i) documenting the procedures for equipment openings and procedures for verifying that events meet the specific conditions, (ii) documenting each circumstance under which the alternative maintenance vent limit is used, and (iii) providing an explanation for why the other criteria could not be met prior to equipment blinding, along with an estimate of the emissions that occurred during the equipment blinding process. The costs assume the alternative limit is used only once per year and 0.1 hours per event are needed to write an explanation.

For degassing tanks, the costs include degassing storage tanks to the control device to 10 percent of the lower explosive limit. The costs assume 104 tanks would be degassed each year.

Storage tanks at facilities located in Texas were excluded from these costs because these facilities are already subject to the state degassing permit conditions. For recordkeeping and reporting, the initial costs include reading the rule, training costs, and initial report preparation. Annual costs include labor costs for preparing periodic reports and recording information.

For MON sources with ethylene oxide controls, there is additional cost for equipment leaks, process vents, and storage tanks. More detailed information on these additional costs is below.

For equipment leaks specifically for ethylene oxide, costs include (i) monthly monitoring of LL pumps at a leak definition of 1,000 ppm instead of 10,000 ppm for batch processes and annual connector monitoring at a leak definition of 500 ppm, (ii) initial and continuous pump repair for new monitoring leak rates, (iii) initial and annual monitoring of connectors, and (iv) administrative costs for connector monitoring. The equipment life is assumed to be 5 years for pump seals and 10 years for annual connector monitoring.

For process vents specifically for ethylene oxide, costs include (i) testing costs for existing scrubbers to meet an ethylene oxide percent reduction of 99.9 percent, (ii) replacing of existing scrubbers with a new scrubbing system (including scrubbers, packing, retention tank, mix tank, pumps, heat exchanger) to achieve 99.9 percent reduction, and (iii) testing costs after installation of the new scrubber and every 5 years thereafter. The equipment life is assumed to be 20 years.

For storage tanks specifically for ethylene oxide, costs include (i) testing costs for existing scrubbers to meet an ethylene oxide percent reduction of 99.9 percent or sampling analysis proving testing is not necessary, (ii) replacing of existing scrubbers with a new scrubbing system (including scrubbers, packing, retention tank, mix tank, pumps, heat exchanger) to achieve 99.9 percent reduction, and (iii) testing costs after installation of the new scrubber and every 5 years thereafter. The equipment life is assumed to be 20 years.

Below in Table C-2, we present total capital investment and total annual costs for (i) all MON facilities, (ii) MON facilities without ethylene oxide controls, and (iii) only MON facilities with ethylene oxide controls. The annual capital costs were calculated using a 5 percent interest rate.

Table C-2. Total Capital Investment and Total Annual Costs (2016\$)

	Number of Facilities w/Costs Associated with New Requirements	Total		
		Capital Investment	Annual Costs w/o Recovery Credits	Annual Costs w/Recovery Credits
All MON Sources - Total		42,697,970	12,658,057	12,311,598
MON Sources w/o Ethylene Oxide Controls - Total		39,705,483	11,409,788	11,066,204
Flares ⁶²	21 ⁶³	17,181,375	4,088,543	4,088,543
MON Equipment Leaks ⁶⁴	193 ⁶⁵	828,775	150,343	81,849
Pressure Relief Devices ⁶⁶	201	18,723,954	4,771,921	4,771,921
Heat Exchange Systems ⁶⁷	201	1,483,221	260,823	(14,268)
Maintenance Vents (Equipment Openings) ⁴	201	-	2,340	2,340
Degassing Tanks ⁶⁸	162	-	489,216	489,216
Recordkeeping and Reporting	201	1,488,159	1,646,602	1,646,602
MON Sources w/Ethylene Oxide Controls - Total		2,992,487	1,248,268	1,245,394
EtO. Equipment Leaks ⁶⁹	7 ⁷⁰	71,125	47,460	44,586

⁶² The flare costs include purchasing analyzers, monitors, natural gas, and steam; developing a flare management plan; and performing root cause analysis and corrective action; the costs are discussed in the memorandum *Control Option Impacts for Flares Located in the Miscellaneous Organic Chemical Manufacturing Source Category*, which is available in the docket.

⁶³ The following summarizes costs for the 21 flares: (i) for 16 flares, costs are to install and operate the suite of new operational and monitoring equipment (TCI: \$1,071,000, TAC: \$255,000) and (ii) for 5 flares, there are one-time costs for initial set-up of a flare management plan because these flares already have the required monitoring equipment (TCI: \$7,400 TCI, TAC: \$1,700).

⁶⁴ Equipment leak costs include LDAR at a leak definition of 1,000 ppmv for light liquid pumps at batch processes and are discussed in the memoranda *Clean Air Act Section 112(d)(6) Technology Review for Equipment Leaks Located in the Miscellaneous Organic Chemical Manufacturing Source Category* and *Clean Air Act Section 112(d)(6) Technology Review for Equipment Leaks Located in the Miscellaneous Organic Chemical Manufacturing Source Category for the Final Rule*, which are available in the docket.

⁶⁵ All 201 facilities are subject, but since this requirement is included in EtO equipment leak requirements we did not want to “double count” costs. As such, only 193 are shown here.

⁶⁶ Pressure relief device costs were developed to comply with the work practice standard being finalized in this action and include implementation of three prevention measures, performing root cause analysis and corrective action, and purchasing pressure relief device monitors. Maintenance costs were estimated to document equipment opening procedures and circumstances under which the alternative maintenance vent limit is used. Costs are discussed in the memorandum *Review of Regulatory Alternatives for Certain Vent Streams in the Miscellaneous Organic Chemical Manufacturing Source Category*, which is available in the docket.

⁶⁷ Heat exchange systems costs include the use of the Modified El Paso Method to monitor for leaks and are discussed in the memoranda *Clean Air Act Section 112(d)(6) Technology Review for Heat Exchange Systems Located in the Miscellaneous Organic Chemical Manufacturing Source Category* and *Clean Air Act Section 112(d)(6) Technology Review for Heat Exchange Systems Located in the Miscellaneous Organic Chemical Manufacturing Source Category For the Final Rule*, which are available in the docket.

⁶⁸ Costs for degassing storage tanks are discussed in the memorandum *Storage Tank Degassing Cost and Emissions Impacts for the Miscellaneous Organic Chemical Manufacturing Source Category*, which is available in the docket.

⁶⁹ Equipment leak costs for equipment in ethylene oxide service include costs for equipment leak co-proposed Control Option 1. This control option includes LDAR at a leak definition of 1,000 ppmv for light liquid pumps at batch processes with monthly monitoring and connector monitoring at a leak definition of 500 ppmv with annual monitoring. Costs are discussed in the memoranda *Analysis of Control Options for Equipment Leaks at Processes that use Ethylene Oxide Located in the Miscellaneous Organic Chemical Manufacturing Source Category* and *Analysis of Control Options for Equipment Leaks at Processes that use Ethylene Oxide Located in the Miscellaneous Organic Chemical Manufacturing Source Category For the Final Rule*, which are available in the docket.

⁷⁰ Eight facilities are expected to meet the threshold; however, one of these facilities already meets the requirements of this amendment.

EtO Process Vents ⁷¹	3	2,743,001	943,071	943,071
EtO Tanks	3 ⁷²	178,361	257,737	257,737

C.2.4 Marine Vessel Tank Loading Operations

We calculated annual costs based on the information listed below that was taken from the preamble for the Marine Vessel Tank Loading Operations finalized in 1995.

These standards will reduce nationwide emissions of HAPs from marine tank vessel loading operations by approximately 4,150 Mg (4,565 tons) after 1999 compared with the emissions that would result in the absence of the standards. These standards will reduce emissions of VOCs from marine tank vessel loading operations by approximately 39,000 Mg (42,900 tons) after 1999 compared with the emissions that would result in the absence of the standards. No significant adverse secondary air, water, solid waste, or energy impacts are anticipated from the promulgation of these standards. The implementation of this regulation is expected to result in nationwide annualized costs for existing marine tank vessel loading operations of \$60 million to \$100 million beyond baseline based on an analysis of applying controls to all existing facilities not currently controlled to the level of the standards. Nationwide capital costs expected to result from these regulations are approximately \$266 million to \$440 million.

The annualized costs will mostly be in the form of capital given that vapor recovery systems are primarily required for control, with a lesser fraction devoted to operating and maintenance.

⁷¹ Costs for process vents and storage tanks in ethylene oxide service include the requirement to control all storage tanks in ethylene oxide service, the installation of a control device that achieves 99.9 percent ethylene oxide emissions reductions, and initial and periodic performance testing of the control device; the costs are discussed in the memoranda *Analysis of Control Options for Storage Tanks and Process Vents Emitting Ethylene Oxide Located in the Miscellaneous Organic Chemical Manufacturing Source Category* and *Analysis of Control Options for Storage Tanks and Process Vents Emitting Ethylene Oxide Located in the Miscellaneous Organic Chemical Manufacturing Source Category for the Final Rule*, which are available in the docket.

⁷² Of the three storage tanks, costs assume that (i) one will be required to install a new control device (TCI: \$158,000, TAC: \$250,800); (ii) one already has a control device that is meeting the required level of control so will only have performance testing costs (TCI: \$19,150, TAC: \$6,900); and (iii) one will test once to demonstrate that they are below the threshold for the requirements to apply (TCI: \$1,000, TAC: \$0).

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