**Appendix F:**

**Burden and Cost for General Stationary Combustion Sources**

**(Subpart C)**

**June 2019**

Table of Contents

[Appendix F-1. Detailed Unit Burden and Costs for GHGRP Reporters Subject to Subpart C Only—Year 1 3](#_Toc10798906)

[Appendix F-2. Detailed Unit Burden and Costs for GHGRP Reporters Subject to Subpart C Only—Year 2 6](#_Toc10798907)

[Appendix F-3. Detailed Unit Burden and Costs for GHGRP Reporters Subject to Subpart C Only—Year 3 9](#_Toc10798908)

[Appendix F-4. Footnotes Applicable to Appendix F-1, Appendix F-2, and Appendix F-3 12](#_Toc10798909)

[Appendix F-5. Detailed Unit Burden and Costs for GHGRP Reporters Subject to Subpart C Plus Another Subpart(s)—Year 1 14](#_Toc10798910)

[Appendix F-6. Detailed Unit Burden and Costs for GHGRP Reporters Subject to Subpart C Plus Another Subpart(s)—Year 2 18](#_Toc10798911)

[Appendix F-7. Detailed Unit Burden and Costs for GHGRP Reporters Subject to Subpart C Plus Another Subpart(s)—Year 3 21](#_Toc10798912)

[Appendix F-8. Footnotes Applicable to Appendix F-5, Appendix F-6, and Appendix F-7 24](#_Toc10798913)

[Appendix F-9. Summary of Burden and Costs for General Stationary Combustion Sources to Comply with Subpart C – by Year 26](#_Toc10798914)

# Appendix F-1. Detailed Unit Burden and Costs for GHGRP Reporters Subject to Subpart C Only—Year 1

| **Year 1** | | | | | | (A) Hours per Occurrence | (B) Occurrences/ Respondent/Year | (C) Hours/ Respondent/ | (D) Respondents/ Year | (E) Technical Hours/ | Legal Hours/Year | Clerical Hours/ | Manager Hours/ | (H) Cost/ Year |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Year (A x B) | Year | Year | Year |
|  | (C x D) |  |  |
| **1. APPLICATIONS (Not Applicable)** | | | | | |  |  |  |  |  |  |  |  |  |
| **2. SURVEY AND STUDIES (Not Applicable)** | | | | | |  |  |  |  |  |  |  |  |  |
| **3. ACQUISITION, INSTALLATION, AND UTILIZATION OF TECHNOLOGY AND SYSTEMS** | | | | | |  |  |  |  |  |  |  |  |  |
| **4. REPORT REQUIREMENTS** | | | | | |  |  |  |  |  |  |  |  |  |
|  | **A1. Read Rule, Instructions, Guidance Documents for Subpart C** 1,2,3 | | | | | 5 | 1 | 5 | 1,998 | 9,990 |  |  |  | $713,786 |
|  | **A2. Read Rule, Instructions, Guidance Documents for Subpart A** 2,3,4 | | | | | 2 | 1 | 2 | 1,998 | 3,996 |  |  |  | $285,514 |
|  | **B. Required Activities** | | | | |  |  |  |  |  |  |  |  |  |
|  | |  | *Activity covering Tier 1 Methodology* | | |  |  |  |  |  |  |  |  |  |
|  | |  |  | Conduct annual review of company records to determine mass or volume of fuel combusted 2,5,6 | | 5 | 1 | 5 | 1,016 | 5,078 |  |  |  | $362,815 |
|  | |  |  | Conduct annual review of billing records to determine natural gas consumption in therms or mmBtu 2,5,6 | | 5 | 1 | 5 | 811 | 4,056 |  |  |  | $289,778 |
|  | |  | *Activity covering Tier 2 Methodology* | | |  |  |  |  |  |  |  |  |  |
|  | |  |  | Conduct annual review of company records to determine mass or volume of fuel combusted 5,7 | | 5 | 1 | 5 | 661 | 3,304 |  |  |  | $236,086 |
|  | |  | *Activity covering Tier 3 Methodology* | | |  |  |  |  |  |  |  |  |  |
|  | |  |  | Conduct annual review of company records to determine mass or volume of fuel combusted 5,8 | | 5 | 1 | 5 | 76 | 381 |  |  |  | $27,241 |
|  | |  | *Tier 1 Methodology for combustion emissions reported under subpart C* | | |  |  |  |  |  |  |  |  |  |
|  | |  |  | Perform engineering calculation to determine CO2 emissions using Eq C-1, C-1a, or C-1b, using default high heat values and/or default emission factors 6,9,10 | | 0.2 | 2.6 | 0.4 | 1,568 | 690 |  |  |  | $49,296 |
|  | |  |  | Perform engineering calculation to determine CH4 and N2O emissions using Eq C-8, Eq C-8a, or Eq C-8b 6,10,11 | | 0.3 | 2.6 | 0.9 | 1,568 | 1,380 |  |  |  | $98,593 |
|  | |  | *Tier 2 Methodology for combustion emissions reported under subpart C* | | |  |  |  |  |  |  |  |  |  |
|  | |  |  | Conduct sampling to determine high heat value for each type of fuel or fuel mixture 7,12 | |  | 2.4 |  | 621 |  |  |  |  |  |
|  | |  |  |  | Daily measurements 14,15 | 0 | 2.1 | 0.0 | 62 | 0 |  |  |  | $0 |
|  | |  |  |  | Hourly measurements 15,17 | 0 | 2.0 | 0.0 | 7 | 0 |  |  |  | $0 |
|  | |  |  |  | Monthly measurements 18,19 | 6 | 2.2 | 13.0 | 401 | 5,222 |  |  |  | $373,110 |
|  | |  |  |  | Quarterly measurements 20,21 | 2 | 3.6 | 7.3 | 18 | 131 |  |  |  | $9,358 |
|  | |  |  |  | Semiannual measurements 22,23 | 1 | 3.9 | 3.9 | 18 | 70 |  |  |  | $4,981 |
|  |  |  |  |  | Weekly measurements 23,24 | 26 | 1.7 | 43.3 | 10 | 412 |  |  |  | $29,432 |
|  | |  |  |  | Other measurement methods 18,26 | 6 | 5.1 | 30.7 | 105 | 3,206 |  |  |  | $229,050 |
|  | |  |  | Perform engineering calculation to determine CO2 emissions using Eq C-2a, along with Eq C-2b or Eq C-2c. 9,12 | | 0.2 | 2.6 | 0.4 | 661 | 282 |  |  |  | $20,148 |
|  | |  |  | Perform engineering calculation to determine CH4 and N2O emissions using Eq C-9a or Eq 9b 11,12 | | 0.3 | 2.6 | 0.9 | 661 | 564 |  |  |  | $40,295 |
|  | |  | *Tier 3 Methodology for combustion emissions reported under subpart C* | | |  |  |  |  |  |  |  |  |  |
|  | |  |  | Conduct sampling to determine carbon content for each type of fuel or fuel mixture 8,27 | |  | 2.1 |  | 76 |  |  |  |  |  |
|  | |  |  |  | Daily measurements 15,28 | 0 | 1.0 | 0.0 | 2 | 0 |  |  |  | $0 |
|  | |  |  |  | Hourly measurements 15,29 | 0 | 2.0 | 0.0 | 2 | 0 |  |  |  | $0 |
|  | |  |  |  | Monthly measurements 18,30 | 6 | 1.9 | 11.3 | 25 | 283 |  |  |  | $20,215 |
|  | |  |  |  | Quarterly measurements 20,31 | 2 | 1.1 | 2.3 | 7 | 16 |  |  |  | $1,147 |
|  | |  |  |  | Semiannual measurements 22,32 | 1 | 3.4 | 3.4 | 5 | 17 |  |  |  | $1,219 |
|  | |  |  |  | Weekly measurements 24,33 | 26 | 1.8 | 45.5 | 8 | 365 |  |  |  | $26,094 |
|  | |  |  |  | Other measurement methods 18,34 | 6 | 8.0 | 48.1 | 27 | 1,304 |  |  |  | $93,182 |
|  | |  |  | Determine annual volume of liquid or gaseous fuel using fuel flow meters 35,36,37 | | 0.5 | 1.3 | 0.6 | 45 | 29 |  |  |  | $2,064 |
|  | |  |  | Determine annual average molecular weight of gaseous fuel 35,38,39 | | 0.5 | 0.7 | 0.3 | 24 | 8 |  |  |  | $566 |
|  | |  |  | Perform engineering calculation to determine CO2 emissions using Eq C-3, Eq C-4, or Eq C-5. 8,9,27 | | 0.2 | 2.1 | 0.4 | 76 | 27 |  |  |  | $1,934 |
|  | |  |  | Perform engineering calculation to determine CH4 and N2O emissions using Eq C-8 11,27 | | 0.3 | 2.1 | 0.7 | 76 | 54 |  |  |  | $3,869 |
|  | |  | *Tier 4 Methodology for combustion emissions reported under subpart C* | | |  |  |  |  |  |  |  |  |  |
|  | |  |  | Gather CEMS data for e-GGRT reporting and QA 40,41 | | 20 | 4 | 80 | 70 | 5,570 |  |  |  | $397,951 |
|  | |  | *Alternative Part 75 Methodology for combustion emissions reported under subpart C* | | |  |  |  |  |  |  |  |  |  |
|  | |  |  | Perform engineering calculation to determine CO2 emissions using Appendix D and G (98.33(a)(5)(i)), LME calculation method (98.33(a)(5)(ii), or CEMS calculation method (98.33(a)(5)(iii)) 9,42 | | 0.2 | 3.1 | 0.5 | 34 | 18 |  |  |  | $1,263 |
|  | | **C. Create Information (Included in 4B)** | | | |  |  |  |  |  |  |  |  |  |
|  | | **D. Gather Existing Information (Included in 4E)** | | | |  |  |  |  |  |  |  |  |  |
|  | | **E. Write Report** | | | |  |  |  |  |  |  |  |  |  |
|  | |  |  | Annual Compliance Reporting through e-GGRT and data QA 3,43 | | 10 | 1 | 10 | 1,998 | 19,980 |  | 1998 | 1998 | $1,674,784 |
| **5. RECORDKEEPING REQUIREMENTS** | | | | | |  |  |  |  |  |  |  |  |  |
|  | | **A. Read Instructions (Included in 4A)** | | | |  |  |  |  |  |  |  |  |  |
|  | | **B. Plan Activities (Included in 4B)** | | | |  |  |  |  |  |  |  |  |  |
|  | | **C. Implement Activities (Included in 4B)** | | | |  |  |  |  |  |  |  |  |  |
|  | | **D. Recordkeeping** 3,44 | | | | 5 | 1 | 5 | 1,998 | 9,990 |  | 999 | 999 | $837,392 |
|  | | **E. Time to Transmit or Disclose Information (included in 4E)** | | | |  |  |  |  |  |  |  |  |  |
|  | | **F. Time to Train Personnel (included in 4A)** | | | |  |  |  |  |  |  |  |  |  |
|  | | **G. Time for Audits (Not Applicable)** | | | |  |  |  |  |  |  |  |  |  |
| **TOTAL ANNUAL LABOR BURDEN AND COST** | | | | | |  |  |  |  | 76,422 |  | 2997 | 2997 | $5,831,163 |
|  | | | | | | | | | | | | | | | |
| **ANNUAL O&M COSTS** | | | | | |  |  |  |  |  |  |  |  |  |
|  | | *Sampling costs for Tier 2 units 7,15,46* | | | |  |  |  |  |  |  |  |  |  |
|  | |  | Monthly samples and analyses 19 | | |  | 2.2 |  | 401 |  |  |  |  | $348,131 |
|  | |  | Quarterly samples and analyses 21 | | |  | 3.6 |  | 18 |  |  |  |  | $26,194 |
|  | |  | Semiannual samples and analyses 23 | | |  | 3.9 |  | 18 |  |  |  |  | $27,884 |
|  | |  | Weekly samples and analyses 25 | | |  | 1.7 |  | 10 |  |  |  |  | $6,337 |
|  | |  | Other measurement methods samples and analyses 26 | | |  | 5.1 |  | 105 |  |  |  |  | $213,716 |
|  | | *Sampling costs for Tier 3 units 8,15,27,46* | | | |  |  |  |  |  |  |  |  |  |
|  | |  | Monthly samples and analyses 30 | | |  | 1.9 |  | 25 |  |  |  |  | $18,862 |
|  |  |  | Quarterly samples and analyses 31 | | |  | 1.1 |  | 7 |  |  |  |  | $3,211 |
|  |  |  | Semiannual samples and analyses 32 | | |  | 3.4 |  | 5 |  |  |  |  | $6,822 |
|  |  |  | Weekly samples and analyses 33 | | |  | 1.8 |  | 8 |  |  |  |  | $5,619 |
|  |  |  | Other measurement methods samples and analyses 34 | | |  | 8.0 |  | 27 |  |  |  |  | $86,943 |
|  | | *Flow meter costs for Tier 3 units* 47,48 | | | |  | 1.3 |  | 2 |  |  |  |  | $6,594 |
|  | | *Sampling costs for Biogenic Testing* | | | |  |  |  |  |  |  |  |  |  |
|  | |  | Annual gas samples and analyses 49,50 | | |  | 2.3 |  | 85 |  |  |  |  | $1,125,864 |
|  | | *Recordkeeping 51* | | | |  | 1 |  | 1998 |  |  |  |  | $99,900 |
|  | | | | | | | | | | | | | | | |
| **ANNUALIZED CAPITAL COSTS** | | | | | |  |  |  |  |  |  |  |  |  |
|  | | *CEMS costs for Tier 4 units* 52,53 | | | |  | 2.0 |  | 3 |  |  |  |  | $115,030 |
|  | | | | | | | | | | | | | | | |
| **TOTAL ANNUAL COSTS (Labor, O&M, and annualized capital)** | | | | | |  |  |  |  |  |  |  |  | $7,922,272 |

# Appendix F-2. Detailed Unit Burden and Costs for GHGRP Reporters Subject to Subpart C Only—Year 2

| **Year 2** | | | | | | (A) Hours per Occurrence | (B) Occurrences/ Respondent/Year | (C) Hours/ Respondent/ | (D) Respondents/ Year | (E) Technical Hours/ | Legal Hours/Year | Clerical Hours/ | Manager Hours/ | (H) Cost/ Year |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Year (A x B) | Year | Year | Year |
|  | (C x D) |  |  |
| **1. APPLICATIONS (Not Applicable)** | | | | | |  |  |  |  |  |  |  |  |  |
| **2. SURVEY AND STUDIES (Not Applicable)** | | | | | |  |  |  |  |  |  |  |  |  |
| **3. ACQUISITION, INSTALLATION, AND UTILIZATION OF TECHNOLOGY AND SYSTEMS** | | | | | |  |  |  |  |  |  |  |  |  |
| **4. REPORT REQUIREMENTS** | | | | | |  |  |  |  |  |  |  |  |  |
|  | **A1. Read Rule, Instructions, Guidance Documents for Subpart C** 1,2,3 | | | | | 5 | 1 | 5 | 2,093 | 10,465 |  |  |  | $747,724 |
|  | **A2. Read Rule, Instructions, Guidance Documents for Subpart A** 2,3,4 | | | | | 2 | 1 | 2 | 2,093 | 4,186 |  |  |  | $299,090 |
|  | **B. Required Activities** | | | | |  |  |  |  |  |  |  |  |  |
|  | |  | *Activity covering Tier 1 Methodology* | | |  |  |  |  |  |  |  |  |  |
|  | |  |  | Conduct annual review of company records to determine mass or volume of fuel combusted 2,5,6 | | 5 | 1 | 5 | 1,064 | 5,319 |  |  |  | $380,066 |
|  | |  |  | Conduct annual review of billing records to determine natural gas consumption in therms or mmBtu 2,5,6 | | 5 | 1 | 5 | 850 | 4,249 |  |  |  | $303,556 |
|  | |  | *Activity covering Tier 2 Methodology* | | |  |  |  |  |  |  |  |  |  |
|  | |  |  | Conduct annual review of company records to determine mass or volume of fuel combusted 5,7 | | 5 | 1 | 5 | 692 | 3,461 |  |  |  | $247,311 |
|  | |  | *Activity covering Tier 3 Methodology* | | |  |  |  |  |  |  |  |  |  |
|  | |  |  | Conduct annual review of company records to determine mass or volume of fuel combusted 5,8 | | 5 | 1 | 5 | 80 | 399 |  |  |  | $28,536 |
|  | |  | *Tier 1 Methodology for combustion emissions reported under subpart C* | | |  |  |  |  |  |  |  |  |  |
|  | |  |  | Perform engineering calculation to determine CO2 emissions using Eq C-1, C-1a, or C-1b, using default high heat values and/or default emission factors 6,9,10 | | 0.2 | 2.6 | 0.4 | 1,643 | 723 |  |  |  | $51,640 |
|  | |  |  | Perform engineering calculation to determine CH4 and N2O emissions using Eq C-8, Eq C-8a, or Eq C-8b 6,10,11 | | 0.3 | 2.6 | 0.9 | 1,643 | 1,445 |  |  |  | $103,281 |
|  | |  | *Tier 2 Methodology for combustion emissions reported under subpart C* | | |  |  |  |  |  |  |  |  |  |
|  | |  |  | Conduct sampling to determine high heat value for each type of fuel or fuel mixture 7,12 | |  | 2.4 |  | 651 |  |  |  |  |  |
|  | |  |  |  | Daily measurements 14,15 | 0 | 2.1 | 0.0 | 65 | 0 |  |  |  | $0 |
|  | |  |  |  | Hourly measurements 15,17 | 0 | 2.0 | 0.0 | 8 | 0 |  |  |  | $0 |
|  | |  |  |  | Monthly measurements 18,19 | 6 | 2.2 | 13.0 | 420 | 5,470 |  |  |  | $390,850 |
|  | |  |  |  | Quarterly measurements 20,21 | 2 | 3.6 | 7.3 | 19 | 137 |  |  |  | $9,803 |
|  | |  |  |  | Semiannual measurements 22,23 | 1 | 3.9 | 3.9 | 19 | 73 |  |  |  | $5,218 |
|  |  |  |  |  | Weekly measurements 23,24 | 26 | 1.7 | 43.3 | 10 | 432 |  |  |  | $30,832 |
|  | |  |  |  | Other measurement methods 18,26 | 6 | 5.1 | 30.7 | 110 | 3,358 |  |  |  | $239,941 |
|  | |  |  | Perform engineering calculation to determine CO2 emissions using Eq C-2a, along with Eq C-2b or Eq C-2c. 9,12 | | 0.2 | 2.6 | 0.4 | 692 | 295 |  |  |  | $21,106 |
|  | |  |  | Perform engineering calculation to determine CH4 and N2O emissions using Eq C-9a or Eq 9b 11,12 | | 0.3 | 2.6 | 0.9 | 692 | 591 |  |  |  | $42,211 |
|  | |  | *Tier 3 Methodology for combustion emissions reported under subpart C* | | |  |  |  |  |  |  |  |  |  |
|  | |  |  | Conduct sampling to determine carbon content for each type of fuel or fuel mixture 8,27 | |  | 2.1 |  | 80 |  |  |  |  |  |
|  | |  |  |  | Daily measurements 15,28 | 0 | 1.0 | 0.0 | 2 | 0 |  |  |  | $0 |
|  | |  |  |  | Hourly measurements 15,29 | 0 | 2.0 | 0.0 | 2 | 0 |  |  |  | $0 |
|  | |  |  |  | Monthly measurements 18,30 | 6 | 1.9 | 11.3 | 26 | 296 |  |  |  | $21,177 |
|  | |  |  |  | Quarterly measurements 20,31 | 2 | 1.1 | 2.3 | 7 | 17 |  |  |  | $1,202 |
|  | |  |  |  | Semiannual measurements 22,32 | 1 | 3.4 | 3.4 | 5 | 18 |  |  |  | $1,277 |
|  | |  |  |  | Weekly measurements 24,33 | 26 | 1.8 | 45.5 | 8 | 383 |  |  |  | $27,334 |
|  | |  |  |  | Other measurement methods 18,34 | 6 | 8.0 | 48.1 | 28 | 1,366 |  |  |  | $97,612 |
|  | |  |  | Determine annual volume of liquid or gaseous fuel using fuel flow meters 35,36,37 | | 0.5 | 1.3 | 0.6 | 47 | 30 |  |  |  | $2,163 |
|  | |  |  | Determine annual average molecular weight of gaseous fuel 35,38,39 | | 0.5 | 0.7 | 0.3 | 25 | 8 |  |  |  | $593 |
|  | |  |  | Perform engineering calculation to determine CO2 emissions using Eq C-3, Eq C-4, or Eq C-5. 8,9,27 | | 0.2 | 2.1 | 0.4 | 80 | 28 |  |  |  | $2,026 |
|  | |  |  | Perform engineering calculation to determine CH4 and N2O emissions using Eq C-8 11,27 | | 0.3 | 2.1 | 0.7 | 80 | 57 |  |  |  | $4,053 |
|  | |  | *Tier 4 Methodology for combustion emissions reported under subpart C* | | |  |  |  |  |  |  |  |  |  |
|  | |  |  | Gather CEMS data for e-GGRT reporting and QA 40,41 | | 20 | 4 | 80 | 73 | 5,834 |  |  |  | $416,873 |
|  | |  | *Alternative Part 75 Methodology for combustion emissions reported under subpart C* | | |  |  |  |  |  |  |  |  |  |
|  | |  |  | Perform engineering calculation to determine CO2 emissions using Appendix D and G (98.33(a)(5)(i)), LME calculation method (98.33(a)(5)(ii), or CEMS calculation method (98.33(a)(5)(iii)) 9,42 | | 0.2 | 3.1 | 0.5 | 36 | 19 |  |  |  | $1,323 |
|  | | **C. Create Information (Included in 4B)** | | | |  |  |  |  |  |  |  |  |  |
|  | | **D. Gather Existing Information (Included in 4E)** | | | |  |  |  |  |  |  |  |  |  |
|  | | **E. Write Report** | | | |  |  |  |  |  |  |  |  |  |
|  | |  |  | Annual Compliance Reporting through e-GGRT and data QA 3,43 | | 10 | 1 | 10 | 2,093 | 20,930 |  | 2093 | 2093 | $1,754,415 |
| **5. RECORDKEEPING REQUIREMENTS** | | | | | |  |  |  |  |  |  |  |  |  |
|  | | **A. Read Instructions (Included in 4A)** | | | |  |  |  |  |  |  |  |  |  |
|  | | **B. Plan Activities (Included in 4B)** | | | |  |  |  |  |  |  |  |  |  |
|  | | **C. Implement Activities (Included in 4B)** | | | |  |  |  |  |  |  |  |  |  |
|  | | **D. Recordkeeping** 3,44 | | | | 5 | 1 | 5 | 2,093 | 10,465 |  | 1046.5 | 1046.5 | $877,208 |
|  | | **E. Time to Transmit or Disclose Information (included in 4E)** | | | |  |  |  |  |  |  |  |  |  |
|  | | **F. Time to Train Personnel (included in 4A)** | | | |  |  |  |  |  |  |  |  |  |
|  | | **G. Time for Audits (Not Applicable)** | | | |  |  |  |  |  |  |  |  |  |
| **TOTAL ANNUAL LABOR BURDEN AND COST** | | | | | |  |  |  |  | 80,056 |  | 3139.5 | 3139.5 | $6,108,421 |
|  | | | | | | | | | | | | | | | |
| **ANNUAL O&M COSTS** | | | | | |  |  |  |  |  |  |  |  |  |
|  | | *Sampling costs for Tier 2 units 7,15,46* | | | |  |  |  |  |  |  |  |  |  |
|  | |  | Monthly samples and analyses 19 | | |  | 2.2 |  | 420 |  |  |  |  | $364,684 |
|  | |  | Quarterly samples and analyses 21 | | |  | 3.6 |  | 19 |  |  |  |  | $27,440 |
|  | |  | Semiannual samples and analyses 23 | | |  | 3.9 |  | 19 |  |  |  |  | $29,210 |
|  | |  | Weekly samples and analyses 25 | | |  | 1.7 |  | 10 |  |  |  |  | $6,639 |
|  | |  | Other measurement methods samples and analyses 26 | | |  | 5.1 |  | 110 |  |  |  |  | $223,878 |
|  | | *Sampling costs for Tier 3 units 8,15,27,46* | | | |  |  |  |  |  |  |  |  |  |
|  | |  | Monthly samples and analyses 30 | | |  | 1.9 |  | 26 |  |  |  |  | $19,759 |
|  |  |  | Quarterly samples and analyses 31 | | |  | 1.1 |  | 7 |  |  |  |  | $3,363 |
|  |  |  | Semiannual samples and analyses 32 | | |  | 3.4 |  | 5 |  |  |  |  | $7,147 |
|  |  |  | Weekly samples and analyses 33 | | |  | 1.8 |  | 8 |  |  |  |  | $5,886 |
|  |  |  | Other measurement methods samples and analyses 34 | | |  | 8.0 |  | 28 |  |  |  |  | $91,077 |
|  | | *Flow meter costs for Tier 3 units* 47,48 | | | |  | 1.3 |  | 2 |  |  |  |  | $6,594 |
|  | | *Sampling costs for Biogenic Testing* | | | |  |  |  |  |  |  |  |  |  |
|  | |  | Annual gas samples and analyses 49,50 | | |  | 2.3 |  | 89 |  |  |  |  | $1,179,396 |
|  | | *Recordkeeping 51* | | | |  | 1 |  | 2093 |  |  |  |  | $104,650 |
|  | | | | | | | | | | | | | | | |
| **ANNUALIZED CAPITAL COSTS** | | | | | |  |  |  |  |  |  |  |  |  |
|  | | *CEMS costs for Tier 4 units* 52,53 | | | |  | 2.0 |  | 7 |  |  |  |  | $230,059 |
|  | | | | | | | | | | | | | | | |
| **TOTAL ANNUAL COSTS (Labor, O&M, and annualized capital)** | | | | | |  |  |  |  |  |  |  |  | $8,408,203 |

# Appendix F-3. Detailed Unit Burden and Costs for GHGRP Reporters Subject to Subpart C Only—Year 3

| **Year 3** | | | | | | (A) Hours per Occurrence | (B) Occurrences/ Respondent/Year | (C) Hours/ Respondent/ | (D) Respondents/ Year | (E) Technical Hours/ | Legal Hours/Year | Clerical Hours/ | Manager Hours/ | (H) Cost/ Year |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Year (A x B) | Year | Year | Year |
|  | (C x D) |  |  |
| **1. APPLICATIONS (Not Applicable)** | | | | | |  |  |  |  |  |  |  |  |  |
| **2. SURVEY AND STUDIES (Not Applicable)** | | | | | |  |  |  |  |  |  |  |  |  |
| **3. ACQUISITION, INSTALLATION, AND UTILIZATION OF TECHNOLOGY AND SYSTEMS** | | | | | |  |  |  |  |  |  |  |  |  |
| **4. REPORT REQUIREMENTS** | | | | | |  |  |  |  |  |  |  |  |  |
|  | **A1. Read Rule, Instructions, Guidance Documents for Subpart C** 1,2,3 | | | | | 5 | 1 | 5 | 2,188 | 10,940.00 |  |  |  | $781,663 |
|  | **A2. Read Rule, Instructions, Guidance Documents for Subpart A** 2,3,4 | | | | | 2 | 1 | 2 | 2,188 | 4,376.00 |  |  |  | $312,665 |
|  | **B. Required Activities** | | | | |  |  |  |  |  |  |  |  |  |
|  | |  | *Activity covering Tier 1 Methodology* | | |  |  |  |  |  |  |  |  |  |
|  | |  |  | Conduct annual review of company records to determine mass or volume of fuel combusted 2,5,6 | | 5 | 1 | 5 | 1,112 | 5,560.76 |  |  |  | $397,317 |
|  | |  |  | Conduct annual review of billing records to determine natural gas consumption in therms or mmBtu 2,5,6 | | 5 | 1 | 5 | 888 | 4,441.35 |  |  |  | $317,334 |
|  | |  | *Activity covering Tier 2 Methodology* | | |  |  |  |  |  |  |  |  |  |
|  | |  |  | Conduct annual review of company records to determine mass or volume of fuel combusted 5,7 | | 5 | 1 | 5 | 724 | 3,618.43 |  |  |  | $258,537 |
|  | |  | *Activity covering Tier 3 Methodology* | | |  |  |  |  |  |  |  |  |  |
|  | |  |  | Conduct annual review of company records to determine mass or volume of fuel combusted 5,8 | | 5 | 1 | 5 | 84 | 417.51 |  |  |  | $29,831 |
|  | |  | *Tier 1 Methodology for combustion emissions reported under subpart C* | | |  |  |  |  |  |  |  |  |  |
|  | |  |  | Perform engineering calculation to determine CO2 emissions using Eq C-1, C-1a, or C-1b, using default high heat values and/or default emission factors 6,9,10 | | 0.2 | 2.6 | 0.4 | 1,717 | 755.55 |  |  |  | $53,984 |
|  | |  |  | Perform engineering calculation to determine CH4 and N2O emissions using Eq C-8, Eq C-8a, or Eq C-8b 6,10,11 | | 0.3 | 2.6 | 0.9 | 1,717 | 1,511.11 |  |  |  | $107,969 |
|  | |  | *Tier 2 Methodology for combustion emissions reported under subpart C* | | |  |  |  |  |  |  |  |  |  |
|  | |  |  | Conduct sampling to determine high heat value for each type of fuel or fuel mixture 7,12 | |  | 2.4 |  | 680 |  |  |  |  |  |
|  | |  |  |  | Daily measurements 14,15 | 0 | 2.1 | 0.0 | 68 | 0.00 |  |  |  | $0 |
|  | |  |  |  | Hourly measurements 15,17 | 0 | 2.0 | 0.0 | 8 | 0.00 |  |  |  | $0 |
|  | |  |  |  | Monthly measurements 18,19 | 6 | 2.2 | 13.0 | 440 | 5,718.56 |  |  |  | $408,591 |
|  | |  |  |  | Quarterly measurements 20,21 | 2 | 3.6 | 7.3 | 20 | 143.43 |  |  |  | $10,248 |
|  | |  |  |  | Semiannual measurements 22,23 | 1 | 3.9 | 3.9 | 20 | 76.34 |  |  |  | $5,454 |
|  |  |  |  |  | Weekly measurements 23,24 | 26 | 1.7 | 43.3 | 10 | 451.10 |  |  |  | $32,231 |
|  | |  |  |  | Other measurement methods 18,26 | 6 | 5.1 | 30.7 | 115 | 3,510.59 |  |  |  | $250,832 |
|  | |  |  | Perform engineering calculation to determine CO2 emissions using Eq C-2a, along with Eq C-2b or Eq C-2c. 9,12 | | 0.2 | 2.6 | 0.4 | 724 | 308.80 |  |  |  | $22,064 |
|  | |  |  | Perform engineering calculation to determine CH4 and N2O emissions using Eq C-9a or Eq 9b 11,12 | | 0.3 | 2.6 | 0.9 | 724 | 617.59 |  |  |  | $44,127 |
|  | |  | *Tier 3 Methodology for combustion emissions reported under subpart C* | | |  |  |  |  |  |  |  |  |  |
|  | |  |  | Conduct sampling to determine carbon content for each type of fuel or fuel mixture 8,27 | |  | 2.1 |  | 84 |  |  |  |  |  |
|  | |  |  |  | Daily measurements 15,28 | 0 | 1.0 | 0.0 | 2 | 0.00 |  |  |  | $0 |
|  | |  |  |  | Hourly measurements 15,29 | 0 | 2.0 | 0.0 | 2 | 0.00 |  |  |  | $0 |
|  | |  |  |  | Monthly measurements 18,30 | 6 | 1.9 | 11.3 | 27 | 309.84 |  |  |  | $22,138 |
|  | |  |  |  | Quarterly measurements 20,31 | 2 | 1.1 | 2.3 | 8 | 17.58 |  |  |  | $1,256 |
|  | |  |  |  | Semiannual measurements 22,32 | 1 | 3.4 | 3.4 | 5 | 18.68 |  |  |  | $1,335 |
|  | |  |  |  | Weekly measurements 24,33 | 26 | 1.8 | 45.5 | 9 | 399.93 |  |  |  | $28,575 |
|  | |  |  |  | Other measurement methods 18,34 | 6 | 8.0 | 48.1 | 30 | 1,428.17 |  |  |  | $102,043 |
|  | |  |  | Determine annual volume of liquid or gaseous fuel using fuel flow meters 35,36,37 | | 0.5 | 1.3 | 0.6 | 50 | 31.64 |  |  |  | $2,261 |
|  | |  |  | Determine annual average molecular weight of gaseous fuel 35,38,39 | | 0.5 | 0.7 | 0.3 | 27 | 8.68 |  |  |  | $620 |
|  | |  |  | Perform engineering calculation to determine CO2 emissions using Eq C-3, Eq C-4, or Eq C-5. 8,9,27 | | 0.2 | 2.1 | 0.4 | 84 | 29.65 |  |  |  | $2,118 |
|  | |  |  | Perform engineering calculation to determine CH4 and N2O emissions using Eq C-8 11,27 | | 0.3 | 2.1 | 0.7 | 84 | 59.30 |  |  |  | $4,237 |
|  | |  | *Tier 4 Methodology for combustion emissions reported under subpart C* | | |  |  |  |  |  |  |  |  |  |
|  | |  |  | Gather CEMS data for e-GGRT reporting and QA 40,41 | | 20 | 4 | 80 | 76 | 6,099.29 |  |  |  | $435,794 |
|  | |  | *Alternative Part 75 Methodology for combustion emissions reported under subpart C* | | |  |  |  |  |  |  |  |  |  |
|  | |  |  | Perform engineering calculation to determine CO2 emissions using Appendix D and G (98.33(a)(5)(i)), LME calculation method (98.33(a)(5)(ii), or CEMS calculation method (98.33(a)(5)(iii)) 9,42 | | 0.2 | 3.1 | 0.5 | 38 | 19.36 |  |  |  | $1,383 |
|  | | **C. Create Information (Included in 4B)** | | | |  |  |  |  |  |  |  |  |  |
|  | | **D. Gather Existing Information (Included in 4E)** | | | |  |  |  |  |  |  |  |  |  |
|  | | **E. Write Report** | | | |  |  |  |  |  |  |  |  |  |
|  | |  |  | Annual Compliance Reporting through e-GGRT and data QA 3,43 | | 10 | 1 | 10 | 2,188 | 21,880.00 |  | 2188 | 2188 | $1,834,047 |
| **5. RECORDKEEPING REQUIREMENTS** | | | | | |  |  |  |  |  |  |  |  |  |
|  | | **A. Read Instructions (Included in 4A)** | | | |  |  |  |  |  |  |  |  |  |
|  | | **B. Plan Activities (Included in 4B)** | | | |  |  |  |  |  |  |  |  |  |
|  | | **C. Implement Activities (Included in 4B)** | | | |  |  |  |  |  |  |  |  |  |
|  | | **D. Recordkeeping** 3,44 | | | | 5 | 1 | 5 | 2,188 | 10,940.00 |  | 1094 | 1094 | $917,024 |
|  | | **E. Time to Transmit or Disclose Information (included in 4E)** | | | |  |  |  |  |  |  |  |  |  |
|  | | **F. Time to Train Personnel (included in 4A)** | | | |  |  |  |  |  |  |  |  |  |
|  | | **G. Time for Audits (Not Applicable)** | | | |  |  |  |  |  |  |  |  |  |
| **TOTAL ANNUAL LABOR BURDEN AND COST** | | | | | |  |  |  |  | 83,689.24 |  | 3282 | 3282 | $6,385,678 |
|  | | | | | | | | | | | | | | | |
| **ANNUAL O&M COSTS** | | | | | |  |  |  |  |  |  |  |  |  |
|  | | *Sampling costs for Tier 2 units 7,15,46* | | | |  |  |  |  |  |  |  |  |  |
|  | |  | Monthly samples and analyses 19 | | |  | 2.2 |  | 440 |  |  |  |  | $381,237 |
|  | |  | Quarterly samples and analyses 21 | | |  | 3.6 |  | 20 |  |  |  |  | $28,685 |
|  | |  | Semiannual samples and analyses 23 | | |  | 3.9 |  | 20 |  |  |  |  | $30,536 |
|  | |  | Weekly samples and analyses 25 | | |  | 1.7 |  | 10 |  |  |  |  | $6,940 |
|  | |  | Other measurement methods samples and analyses 26 | | |  | 5.1 |  | 115 |  |  |  |  | $234,039 |
|  | | *Sampling costs for Tier 3 units 8,15,27,46* | | | |  |  |  |  |  |  |  |  |  |
|  | |  | Monthly samples and analyses 30 | | |  | 1.9 |  | 27 |  |  |  |  | $20,656 |
|  |  |  | Quarterly samples and analyses 31 | | |  | 1.1 |  | 8 |  |  |  |  | $3,516 |
|  |  |  | Semiannual samples and analyses 32 | | |  | 3.4 |  | 5 |  |  |  |  | $7,471 |
|  |  |  | Weekly samples and analyses 33 | | |  | 1.8 |  | 9 |  |  |  |  | $6,153 |
|  |  |  | Other measurement methods samples and analyses 34 | | |  | 8.0 |  | 30 |  |  |  |  | $95,211 |
|  | | *Flow meter costs for Tier 3 units* 47,48 | | | |  | 1.3 |  | 2 |  |  |  |  | $6,594 |
|  | | *Sampling costs for Biogenic Testing* | | | |  |  |  |  |  |  |  |  |  |
|  | |  | Annual gas samples and analyses 49,50 | | |  | 2.3 |  | 93 |  |  |  |  | $1,232,928 |
|  | | *Recordkeeping* 51 | | | |  | 1 |  | 2188 |  |  |  |  | $109,400 |
|  | | | | | | | | | | | | | | | |
| **ANNUALIZED CAPITAL COSTS** | | | | | |  |  |  |  |  |  |  |  |  |
|  | | *CEMS costs for Tier 4 units* 52,53 | | | |  | 2.0 |  | 10 |  |  |  |  | $345,089 |
|  | | | | | | | | | | | | | | | |
| **TOTAL ANNUAL COSTS (Labor, O&M, and annualized capital)** | | | | | |  |  |  |  |  |  |  |  | $8,894,134 |

# Appendix F-4. Footnotes Applicable to Appendix F-1, Appendix F-2, and Appendix F-3

|  |
| --- |
| Note: Figures may not add exactly due to rounding. |
| 1 Assumed 5 hours per reporter per year to read rule. |
| 2 Assumed activity occurs once per year per reporter. |
| 3 There are 1808 facilities that reported only subpart C in RY2017, with an additional 95 new reporters per year. |
| 4 Assumed 2 hours per reporter per year to read rule. |
| 5 Assumed 5 hours per year to review company records. |
| 6 There are 1419 facilities that reported only subpart C under Tier 1 in RY2017, with an additional 75 new reporters per year. 1016 of those facilities reported using Eq C-1 and 811 facilities reported using Eq C-1a and/or Eq C-1b. |
| 7 There are 598 facilities that reported only subpart C under Tier 2 in RY2017, with an additional 31 new reporters per year. 621 of those facilities reported using Eq C-2a and 52 facilities reported using Eq C-2c. |
| 8 There are 69 facilities that reported only subpart C under Tier 3 in RY2017, with an additional 4 new reporters per year. 38 of those facilities reported using Eq C-3, 21 facilities reported using Eq C-4, and 24 facilities reported using Eq C-5. |
| 9 Assumed 10 minutes per pollutant per fuel [1 pollutant]. |
| 10 Using RY2017 data, there are 0.56 fuels per facility using Eq C-1a; 0.37 fuels per facility using Eq C-1b; 1.71 fuels per facility using Eq. C-1. |
| 11 Assumed 10 minutes per pollutant per fuel [2 pollutants]. |
| 12 Using RY2017 data, there are 2.43 fuels per facility using Eq C-2a and 0.13 fuels per facility using Eq C-2c. |
| 13 [reserved] |
| 14 Using RY2017 data, 10% of Tier 2 Eqn. C-2a facilities perform daily measurements for an average of 2.1 fuels per facility. |
| 15 Assumed that hourly and daily sampling is done automatically via continuous, on-line equipment and, therefore, no lab analyses are required. |
| 16 [reserved] |
| 17 Using RY2017 data, 1.2% of Tier 2 Eq C-2a facilities perform hourly measurements for an average of 2 fuels per facility. |
| 18 Assumed 0.5 hour per fuel and 12 measurements per year. |
| 19 Using RY2017 data, 65% of Tier 2 Eq C-2a facilities perform monthly measurements for an average of 2.2 fuels per facility. |
| 20 Assumed 0.5 hour per fuel and 4 measurements per year. |
| 21 Using RY2017 data, 2.9% of Tier 2 Eq C-2a facilities perform quarterly measurements for an average of 3.6 fuels per facility. |
| 22 Assumed 0.5 hour per fuel and 2 measurements per year. |
| 23 Using RY2017 data, 2.9% of Tier 2 Eq C-2a facilities perform semiannual measurements for an average of 3.9 fuels per facility. |
| 24 Assumed 0.5 hour per fuel and 52 measurements per year. |
| 25 Using RY2017 data, 1.5% of Tier 2 Eq C-2a facilities perform weekly measurements for an average of 1.7 fuels per facility. |
| 26 Other measurement methods include once per fuel lot, upon addition of oil to the storage tank, and other specified measurement methods. Using RY2017 data, 17% of Tier 2 C-2a facilities perform measurements at one of these frequencies for an average of 5.1 fuels per facility." |
| 27 Using RY2017 data, there are 2.13 fuels per respondent using Tier 3 methodology. |
| 28 Using RY2017 data, 2.6% of Tier 3 facilities perform daily measurements for an average of 1 fuel per facility. |
| 29 Using RY2017 data, 2.6% of Tier 3 facilities perform hourly measurements for an average of 2 fuels per facility. |
| 30 Using RY2017 data, 33% of Tier 3 facilities perform monthly measurements for an average of 1.9 fuels per facility. |
| 31 Using RY2017 data, 9.2% of Tier 3 facilities perform quarterly measurements for an average of 1.1 fuels per facility. |
| 32 Using RY2017 data, 6.6% of Tier 3 facilities perform semiannual measurements for an average of 3.4 fuels per facility. |
| 33 Using RY2017 data, 11% of Tier 3 facilities perform weekly measurements for an average of 1.8 fuels per facility. |
| 34 Other measurement methods include once per fuel lot, upon addition of oil to the storage tank, and other specified measurement methods. Using RY2017 data, 36% of Tier 3 facilities perform measurements at one of these frequencies for an average of 8 fuels per facility. |
| 35 Assumed 0.5 hours per fuel to determine the annual volume of fuel or annual average molecular weight of gaseous fuel. |
| 36 Using RY2017 data, there are 1.28 liquid or gaseous fuels per respondent using Tier 3 methodology. |
| 37 Using RY2017 data, there are 41 facilities reporting only subpart C which used liquid or gaseous fuel, with an additional 2 new reporters per year. |
| 38 Using RY2017 data, there are 0.65 gaseous fuels per respondent using Tier 3 methodology. |
| 39 Using RY2017 data, there are 22 facilities reporting only subpart C used gaseous fuel, with an additional 1 new reporter per year. |
| 40 Assumed 20 hours per quarter to gather and QA the CEMS data. |
| 41 Using RY2017 data, there are 63 facilities reporting only subpart C used Tier 4, with an additional 3 new reporters per year. |
| 42 Using RY2017 data, there are 31 facilities reporting only subpart C used Alternative Part 75 methodology, with an additional 2 new reporters per year. There are 3.1 fuels per Alternative Part 75 facility. |
| 43 Assumed 10 technical hours, 1 clerical hour, and 1 manager hour per reporter per year to submit report through e-GGRT and QA the data. |
| 44 Assumed 5 technical hours, 0.5 clerical hours, and 0.5 manager hours per reporter per year to maintain records. |
| 45 Number of occurrences per respondent based on average number of fuels reported for Tier 2 C-2a units in RY2017. |
| 46 Assumed testing cost of $400 per fuel. |
| 47 Number of occurrences per respondent based on average number of fuels reported by segment for new Tier 3 C-4 and C-5 units in RY2017. Assumed meter is installed upon startup of new units. |
| 48 Assumed operational cost of $2,400 per fuel per flow meter. |
| 49 Number of occurrences per respondent based on average number of units with reported biogenic testing results per reporter in RY2017. |
| 50 Assumed testing cost of $5660 per unit. Assumed that direct emissions measurements infrastructure is already installed (e.g., ports and platforms). |
| 51 Assumed $50 per reporter per year, which includes the cost of file cabinets, hard drives, and cloud file storage for the GHGRP records required to be maintained. |
| 52 Number of occurrences per respondent based on average number of units reported per facility for new Tier 4 facilities in RY2017. Assumed facilities with units installed before Year 1 of this ICR have completed their annualized capital payments. |
| 53 Assumed capital cost of $124,000 per unit per CEMS device, which is an annualized cost of $17,654.81 (annualized at 10 years, 7% interest). Assumed new Tier 4 reporters would add both a CO2 analyzer and a volumetric flow monitor to an existing CEMS device. |

# Appendix F-5. Detailed Unit Burden and Costs for GHGRP Reporters Subject to Subpart C Plus Another Subpart(s)—Year 1

| **Year 1** | | | | | (A) Hours per Occurrence | (B) Occurrences/ Respondent/Year | (C) Hours/ Respondent/ | (D) Respondents/ Year | (E) Technical Hours/ | Legal Hours/Year | Clerical Hours/ | Manager Hours/ | (H) Cost/ Year |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Year (A x B) | Year | Year | Year |
|  | (C x D) |  |  |
| **1. APPLICATIONS (Not Applicable)** | | | | |  |  |  |  |  |  |  |  |  |
| **2. SURVEY AND STUDIES (Not Applicable)** | | | | |  |  |  |  |  |  |  |  |  |
| **3. ACQUISITION, INSTALLATION, AND UTILIZATION OF TECHNOLOGY AND SYSTEMS** | | | | |  |  |  |  |  |  |  |  |  |
| **4. REPORT REQUIREMENTS** | | | | |  |  |  |  |  |  |  |  |  |
|  | **A. Read Rule, Instructions, Guidance Documents** 1,2,3 | | | | 5 | 1 | 5 | 3,790 | 18,950 |  |  |  | $1,353,978 |
|  | **B. Required Activities** | | | |  |  |  |  |  |  |  |  |  |
|  |  | *Activity covering Tier 1 Methodology* | | |  |  |  |  |  |  |  |  |  |
|  |  |  | Conduct annual review of company records to determine mass or volume of fuel combusted 1,2,4 | | 5 | 1 | 5 | 1,857 | 9,284 |  |  |  | $663,324 |
|  |  |  | Conduct annual review of billing records to determine natural gas consumption in therms or mmBtu 1,2,4 | | 5 | 1 | 5 | 511 | 2,557 |  |  |  | $182,717 |
|  |  | *Activity covering Tier 2 Methodology* | | |  |  |  |  |  |  |  |  |  |
|  |  |  | Conduct annual review of billing records to determine natural gas consumption in therms or mmBtu 1,2,5 | | 5 | 1 | 5 | 1,998 | 9,989 |  |  |  | $713,688 |
|  |  | *Activity covering Tier 3 Methodology* | | |  |  |  |  |  |  |  |  |  |
|  |  |  | Conduct annual review of company records to determine mass or volume of fuel combusted 1,2,6 | | 5 | 1 | 5 | 256 | 1,279 |  |  |  | $91,358 |
|  |  | *Tier 1 Methodology for combustion emissions reported under subpart C* | | |  |  |  |  |  |  |  |  |  |
|  |  |  | Perform engineering calculation to determine CO2 emissions using Eq C-1, C-1a, or C-1b, using default high heat values and/or default emission factors 4,7,8 | | 0.2 | 2.7 | 0.5 | 2,164 | 975 |  |  |  | $69,690 |
|  |  |  | Perform engineering calculation to determine CH4 and N2O emissions using Eq C-8, Eq C-8a, or Eq C-8b 4,8,9 | | 0.3 | 2.7 | 0.9 | 2,164 | 1,951 |  |  |  | $139,380 |
|  |  | *Tier 2 Methodology for combustion emissions reported under subpart C* | | |  |  |  |  |  |  |  |  |  |
|  |  |  | Conduct sampling to determine high heat value for each type of fuel or fuel mixture 5,10 | |  | 2.6 |  | 1,996 |  |  |  |  |  |
|  |  |  |  | Daily measurements 12,13 | 0 | 2.0 | 0.0 | 325 | 0 |  |  |  | $0 |
|  |  |  |  | Hourly measurements 13,14 | 0 | 2.4 | 0.0 | 79 | 0 |  |  |  | $0 |
|  |  |  |  | Monthly measurements 15,16 | 6 | 2.8 | 16.8 | 1,031 | 17,357 |  |  |  | $1,240,127 |
|  |  |  |  | Quarterly measurements 17,18 | 2 | 2.3 | 4.6 | 139 | 641 |  |  |  | $45,832 |
|  |  |  |  | Semiannual measurements 19,20 | 1 | 1.7 | 1.7 | 194 | 335 |  |  |  | $23,948 |
|  |  |  |  | Weekly measurements 21,22 | 26 | 2.0 | 51.4 | 45 | 2,333 |  |  |  | $166,677 |
|  |  |  |  | Other measurement methods 15,23 | 6 | 8.0 | 47.8 | 182 | 8,668 |  |  |  | $619,306 |
|  |  |  | Perform engineering calculation to determine CO2 emissions using Eq C-2a, along with Eq C-2b or Eq C-2c. 5,7,10 | | 0.2 | 2.6 | 0.4 | 1,998 | 873 |  |  |  | $62,389 |
|  |  |  | Perform engineering calculation to determine CH4 and N2O emissions using Eq C-9a or Eq 9b 5,9,10 | | 0.3 | 2.6 | 0.9 | 1,998 | 1,746 |  |  |  | $124,778 |
|  |  | *Tier 3 Methodology for combustion emissions reported under subpart C* | | |  |  |  |  |  |  |  |  |  |
|  |  |  | Conduct sampling to determine carbon content for each type of fuel or fuel mixture 6,24 | |  | 6.3 |  | 256 |  |  |  |  |  |
|  |  |  |  | Daily measurements 13,25 | 0 | 6.9 | 0.0 | 56 | 0 |  |  |  | $0 |
|  |  |  |  | Hourly measurements 13,26 | 0 | 12.3 | 0.0 | 9 | 0 |  |  |  | $0 |
|  |  |  |  | Monthly measurements 15,27 | 6 | 3.4 | 20.2 | 70 | 1,418 |  |  |  | $101,342 |
|  |  |  |  | Quarterly measurements 17,28 | 2 | 1.9 | 3.8 | 11 | 44 |  |  |  | $3,139 |
|  |  |  |  | Semiannual measurements 19,29 | 1 | 1.0 | 1.0 | 4 | 4 |  |  |  | $314 |
|  |  |  |  | Weekly measurements 21,30 | 26 | 7.0 | 181.6 | 65 | 11,813 |  |  |  | $844,013 |
|  |  |  |  | Other measurement methods 15,31 | 6 | 4.0 | 24.0 | 40 | 949 |  |  |  | $67,812 |
|  |  |  | Determine annual volume of liquid or gaseous fuel using fuel flow meters 32,33,34 | | 0.5 | 5.9 | 2.9 | 213 | 625 |  |  |  | $44,638 |
|  |  |  | Determine annual average molecular weight of gaseous fuel 32,35,36 | | 0.5 | 5.8 | 2.9 | 201 | 578 |  |  |  | $41,322 |
|  |  |  | Perform engineering calculation to determine CO2 emissions using Eq C-3, Eq C-4, or Eq C-5. 6,7,24 | | 0.2 | 6.3 | 1.1 | 256 | 270 |  |  |  | $19,261 |
|  |  |  | Perform engineering calculation to determine CH4 and N2O emissions using Eq C-8 6,9,24 | | 0.3 | 6.3 | 2.1 | 256 | 539 |  |  |  | $38,521 |
|  |  | *Tier 4 Methodology for combustion emissions reported under subpart C* | | |  |  |  |  |  |  |  |  |  |
|  |  |  | Gather CEMS data for e-GGRT reporting 37,38 | | 20 | 4 | 80 | 69 | 5,508 |  |  |  | $393,544 |
|  |  | *Alternative Part 75 Methodology for combustion emissions reported under subpart C* | | |  |  |  |  |  |  |  |  |  |
|  |  |  | Perform engineering calculation to determine CO2 emissions using Appendix D and G (98.33(a)(5)(i)), LME calculation method (98.33(a)(5)(ii), or CEMS calculation method (98.33(a)(5)(iii)) 7,39 | | 0.2 | 3.9 | 0.7 | 34 | 22 |  |  |  | $1,588 |
|  | **C. Create Information (Included in 4B)** | | | |  |  |  |  |  |  |  |  |  |
|  | **D. Gather Existing Information (Included in 4E)** | | | |  |  |  |  |  |  |  |  |  |
|  | **E. Write Report** | | | |  |  |  |  |  |  |  |  |  |
|  |  |  | Annual Compliance Reporting through e-GGRT and QA 3,40 | | 10 | 1 | 10 | 3,790 | 37,900 |  | 3790 | 3790 | $3,176,892 |
| **5. RECORDKEEPING REQUIREMENTS** | | | | |  |  |  |  |  |  |  |  |  |
|  | **A. Read Instructions (Included in 4A)** | | | |  |  |  |  |  |  |  |  |  |
|  | **B. Plan Activities (Included in 4B)** | | | |  |  |  |  |  |  |  |  |  |
|  | **C. Implement Activities (Included in 4B)** | | | |  |  |  |  |  |  |  |  |  |
|  | **D. Recordkeeping** 3,41 | | | | 5 | 1 | 5 | 3,790 | 18,950 |  | 1895 | 1895 | $1,588,446 |
|  | **E. Time to Transmit or Disclose Information (included in 4E)** | | | |  |  |  |  |  |  |  |  |  |
|  | **F. Time to Train Personnel (included in 4A)** | | | |  |  |  |  |  |  |  |  |  |
|  | **G. Time for Audits (Not Applicable)** | | | |  |  |  |  |  |  |  |  |  |
| **TOTAL ANNUAL LABOR BURDEN AND COST** | | | | |  |  |  |  | 155,558 |  | 5685 | 5685 | $11,818,024 |
|  | | | | | | | | | | | | | | |
| **ANNUAL TESTING COSTS (O&M)** | | | | |  |  |  |  |  |  |  |  |  |
|  | *Sampling costs for Tier 2 units 5,13,43* | | | |  |  |  |  |  |  |  |  |  |
|  |  | Monthly samples and analyses 16 | | |  | 2.8 |  | 1,031 |  |  |  |  | $1,157,105 |
|  |  | Quarterly samples and analyses 18 | | |  | 2.3 |  | 139 |  |  |  |  | $128,292 |
|  |  | Semiannual samples and analyses 20 | | |  | 1.7 |  | 194 |  |  |  |  | $134,067 |
|  |  | Weekly samples and analyses 22 | | |  | 2.0 |  | 45 |  |  |  |  | $35,889 |
|  |  | Other measurement methods samples and analyses 23 | | |  | 8.0 |  | 182 |  |  |  |  | $577,845 |
|  | *Sampling costs for Tier 3 units 6,13,24,43* | | | |  |  |  |  |  |  |  |  |  |
|  |  | Monthly samples and analyses 27 | | |  | 3.4 |  | 70 |  |  |  |  | $94,557 |
|  |  | Quarterly samples and analyses 28 | | |  | 1.9 |  | 11 |  |  |  |  | $8,788 |
|  |  | Semiannual samples and analyses 29 | | |  | 1.0 |  | 4 |  |  |  |  | $1,758 |
|  |  | Weekly samples and analyses 30 | | |  | 7.0 |  | 65 |  |  |  |  | $181,733 |
|  |  | Other measurement methods samples and analyses 31 | | |  | 4.0 |  | 40 |  |  |  |  | $63,273 |
|  | *Flow meter costs for Tier 3 units* 44,45 | | | |  | 5.9 |  | 9 |  |  |  |  | $127,389 |
|  | *Sampling costs for Biogenic Testing* | | | |  |  |  |  |  |  |  |  |  |
|  |  | Annual gas samples and analyses 46,47 | | |  | 4.0 |  | 32 |  |  |  |  | $717,521 |
|  | *Recordkeeping 48* | | | |  | 1 |  | 3,790 |  |  |  |  | $189,500 |
|  | | | | | | | | | | | | | | |
| **ANNUALIZED CAPITAL COSTS** | | | | |  |  |  |  |  |  |  |  |  |
|  | *CEMS costs for Tier 4 units* 49,50 | | | |  | 1.8 |  | 3 |  |  |  |  | $90,977 |
|  | | | | | | | | | | | | | | |
| **TOTAL ANNUAL COSTS (Labor, O&M, and annualized capital)** | | | | |  |  |  |  |  |  |  |  | $15,326,718 |

# Appendix F-6. Detailed Unit Burden and Costs for GHGRP Reporters Subject to Subpart C Plus Another Subpart(s)—Year 2

| **Year 2** | | | | | (A) Hours per Occurrence | (B) Occurrences/ Respondent/Year | (C) Hours/ Respondent/ | (D) Respondents/ Year | (E) Technical Hours/ | Legal Hours/Year | Clerical Hours/ | Manager Hours/ | (H) Cost/ Year |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Year (A x B) | Year | Year | Year |
|  | (C x D) |  |  |
| **1. APPLICATIONS (Not Applicable)** | | | | |  |  |  |  |  |  |  |  |  |
| **2. SURVEY AND STUDIES (Not Applicable)** | | | | |  |  |  |  |  |  |  |  |  |
| **3. ACQUISITION, INSTALLATION, AND UTILIZATION OF TECHNOLOGY AND SYSTEMS** | | | | |  |  |  |  |  |  |  |  |  |
| **4. REPORT REQUIREMENTS** | | | | |  |  |  |  |  |  |  |  |  |
|  | **A. Read Rule, Instructions, Guidance Documents** 1,2,3 | | | | 5 | 1 | 5 | 3951 | 19,755 |  |  |  | $1,411,495 |
|  | **B. Required Activities** | | | |  |  |  |  |  |  |  |  |  |
|  |  | *Activity covering Tier 1 Methodology* | | |  |  |  |  |  |  |  |  |  |
|  |  |  | Conduct annual review of company records to determine mass or volume of fuel combusted 1,2,4 | | 5 | 1 | 5 | 1936 | 9,678 |  |  |  | $691,502 |
|  |  |  | Conduct annual review of billing records to determine natural gas consumption in therms or mmBtu 1,2,4 | | 5 | 1 | 5 | 533 | 2,666 |  |  |  | $190,479 |
|  |  | *Activity covering Tier 2 Methodology* | | |  |  |  |  |  |  |  |  |  |
|  |  |  | Conduct annual review of billing records to determine natural gas consumption in therms or mmBtu 1,2,5 | | 5 | 1 | 5 | 2083 | 10,413 |  |  |  | $744,006 |
|  |  | *Activity covering Tier 3 Methodology* | | |  |  |  |  |  |  |  |  |  |
|  |  |  | Conduct annual review of company records to determine mass or volume of fuel combusted 1,2,6 | | 5 | 1 | 5 | 267 | 1,333 |  |  |  | $95,239 |
|  |  | *Tier 1 Methodology for combustion emissions reported under subpart C* | | |  |  |  |  |  |  |  |  |  |
|  |  |  | Perform engineering calculation to determine CO2 emissions using Eq C-1, C-1a, or C-1b, using default high heat values and/or default emission factors 4,7,8 | | 0.2 | 2.7 | 0.5 | 2256 | 1,017 |  |  |  | $72,650 |
|  |  |  | Perform engineering calculation to determine CH4 and N2O emissions using Eq C-8, Eq C-8a, or Eq C-8b 4,8,9 | | 0.3 | 2.7 | 0.9 | 2256 | 2,034 |  |  |  | $145,301 |
|  |  | *Tier 2 Methodology for combustion emissions reported under subpart C* | | |  |  |  |  |  |  |  |  |  |
|  |  |  | Conduct sampling to determine high heat value for each type of fuel or fuel mixture 5,10 | |  | 2.6 |  | 2080 |  |  |  |  |  |
|  |  |  |  | Daily measurements 12,13 | 0 | 2.0 | 0.0 | 339 | 0 |  |  |  | $0 |
|  |  |  |  | Hourly measurements 13,14 | 0 | 2.4 | 0.0 | 83 | 0 |  |  |  | $0 |
|  |  |  |  | Monthly measurements 15,16 | 6 | 2.8 | 16.8 | 1075 | 18,094 |  |  |  | $1,292,808 |
|  |  |  |  | Quarterly measurements 17,18 | 2 | 2.3 | 4.6 | 145 | 669 |  |  |  | $47,779 |
|  |  |  |  | Semiannual measurements 19,20 | 1 | 1.7 | 1.7 | 202 | 349 |  |  |  | $24,965 |
|  |  |  |  | Weekly measurements 21,22 | 26 | 2.0 | 51.4 | 47 | 2,432 |  |  |  | $173,757 |
|  |  |  |  | Other measurement methods 15,23 | 6 | 8.0 | 47.8 | 189 | 9,036 |  |  |  | $645,614 |
|  |  |  | Perform engineering calculation to determine CO2 emissions using Eq C-2a, along with Eq C-2b or Eq C-2c. 5,7,10 | | 0.2 | 2.6 | 0.4 | 2083 | 910 |  |  |  | $65,039 |
|  |  |  | Perform engineering calculation to determine CH4 and N2O emissions using Eq C-9a or Eq 9b 5,9,10 | | 0.3 | 2.6 | 0.9 | 2083 | 1,821 |  |  |  | $130,079 |
|  |  | *Tier 3 Methodology for combustion emissions reported under subpart C* | | |  |  |  |  |  |  |  |  |  |
|  |  |  | Conduct sampling to determine carbon content for each type of fuel or fuel mixture 6,24 | |  | 6.3 |  | 267 |  |  |  |  |  |
|  |  |  |  | Daily measurements 13,25 | 0 | 6.9 | 0 | 59 | 0 |  |  |  | $0 |
|  |  |  |  | Hourly measurements 13,26 | 0 | 12.3 | 0 | 9 | 0 |  |  |  | $0 |
|  |  |  |  | Monthly measurements 15,27 | 6 | 3.4 | 20.2 | 73 | 1,479 |  |  |  | $105,647 |
|  |  |  |  | Quarterly measurements 17,28 | 2 | 1.9 | 3.8 | 12 | 46 |  |  |  | $3,273 |
|  |  |  |  | Semiannual measurements 19,29 | 1 | 1.0 | 1.0 | 5 | 5 |  |  |  | $327 |
|  |  |  |  | Weekly measurements 21,30 | 26 | 7.0 | 181.6 | 68 | 12,314 |  |  |  | $879,867 |
|  |  |  |  | Other measurement methods 15,31 | 6 | 4.0 | 24.0 | 41 | 989 |  |  |  | $70,693 |
|  |  |  | Determine annual volume of liquid or gaseous fuel using fuel flow meters 32,33,34 | | 0.5 | 5.9 | 2.9 | 222 | 651 |  |  |  | $46,534 |
|  |  |  | Determine annual average molecular weight of gaseous fuel 32,35,36 | | 0.5 | 5.8 | 2.9 | 210 | 603 |  |  |  | $43,077 |
|  |  |  | Perform engineering calculation to determine CO2 emissions using Eq C-3, Eq C-4, or Eq C-5. 6,7,24 | | 0.2 | 6.3 | 1.1 | 267 | 281 |  |  |  | $20,079 |
|  |  |  | Perform engineering calculation to determine CH4 and N2O emissions using Eq C-8 6,9,24 | | 0.3 | 6.3 | 2.1 | 267 | 562 |  |  |  | $40,158 |
|  |  | *Tier 4 Methodology for combustion emissions reported under subpart C* | | |  |  |  |  |  |  |  |  |  |
|  |  |  | Gather CEMS data for e-GGRT reporting 37,38 | | 20 | 4 | 80 | 72 | 5,742 |  |  |  | $410,261 |
|  |  | *Alternative Part 75 Methodology for combustion emissions reported under subpart C* | | |  |  |  |  |  |  |  |  |  |
|  |  |  | Perform engineering calculation to determine CO2 emissions using Appendix D and G (98.33(a)(5)(i)), LME calculation method (98.33(a)(5)(ii), or CEMS calculation method (98.33(a)(5)(iii)) 7,39 | | 0.2 | 3.9 | 0.7 | 35 | 23 |  |  |  | $1,655 |
|  | **C. Create Information (Included in 4B)** | | | |  |  |  |  |  |  |  |  |  |
|  | **D. Gather Existing Information (Included in 4E)** | | | |  |  |  |  |  |  |  |  |  |
|  | **E. Write Report** | | | |  |  |  |  |  |  |  |  |  |
|  |  |  | Annual Compliance Reporting through e-GGRT and QA 3,40 | | 10 | 1 | 10 | 3,951 | 39,510 |  | 3951 | 3951 | $3,311,847 |
| **5. RECORDKEEPING REQUIREMENTS** | | | | |  |  |  |  |  |  |  |  |  |
|  | **A. Read Instructions (Included in 4A)** | | | |  |  |  |  |  |  |  |  |  |
|  | **B. Plan Activities (Included in 4B)** | | | |  |  |  |  |  |  |  |  |  |
|  | **C. Implement Activities (Included in 4B)** | | | |  |  |  |  |  |  |  |  |  |
|  | **D. Recordkeeping** 3,41 | | | | 5 | 1 | 5 | 3,951 | 19,755 |  | 1976 | 1976 | $1,655,923 |
|  | **E. Time to Transmit or Disclose Information (included in 4E)** | | | |  |  |  |  |  |  |  |  |  |
|  | **F. Time to Train Personnel (included in 4A)** | | | |  |  |  |  |  |  |  |  |  |
|  | **G. Time for Audits (Not Applicable)** | | | |  |  |  |  |  |  |  |  |  |
| **TOTAL ANNUAL LABOR BURDEN AND COST** | | | | |  |  |  |  | 162,166 |  | 5926.5 | 5926.5 | $12,320,056 |
|  | | | | | | | | | | | | | | |
| **ANNUAL TESTING COSTS (O&M)** | | | | |  |  |  |  |  |  |  |  |  |
|  | *Sampling costs for Tier 2 units 5,13,43* | | | |  |  |  |  |  |  |  |  |  |
|  |  | Monthly samples and analyses 16 | | |  | 2.8 |  | 1,075 |  |  |  |  | $1,206,259 |
|  |  | Quarterly samples and analyses 18 | | |  | 2.3 |  | 145 |  |  |  |  | $133,742 |
|  |  | Semiannual samples and analyses 20 | | |  | 1.7 |  | 202 |  |  |  |  | $139,763 |
|  |  | Weekly samples and analyses 22 | | |  | 2.0 |  | 47 |  |  |  |  | $37,413 |
|  |  | Other measurement methods samples and analyses 23 | | |  | 8.0 |  | 189 |  |  |  |  | $602,392 |
|  | *Sampling costs for Tier 3 units 6,13,24,43* | | | |  |  |  |  |  |  |  |  |  |
|  |  | Monthly samples and analyses 27 | | |  | 3.4 |  | 73 |  |  |  |  | $98,574 |
|  |  | Quarterly samples and analyses 28 | | |  | 1.9 |  | 12 |  |  |  |  | $9,161 |
|  |  | Semiannual samples and analyses 29 | | |  | 1.0 |  | 5 |  |  |  |  | $1,832 |
|  |  | Weekly samples and analyses 30 | | |  | 7.0 |  | 68 |  |  |  |  | $189,453 |
|  |  | Other measurement methods samples and analyses 31 | | |  | 4.0 |  | 41 |  |  |  |  | $65,960 |
|  | *Flow meter costs for Tier 3 units* 44,45 | | | |  | 5.9 |  | 9 |  |  |  |  | $127,389 |
|  | *Sampling costs for Biogenic Testing* | | | |  |  |  |  |  |  |  |  |  |
|  |  | Annual gas samples and analyses 46,47 | | |  | 4.0 |  | 33 |  |  |  |  | $748,001 |
|  | *Recordkeeping 48* | | | |  | 1 |  | 3,951 |  |  |  |  | $197,550 |
|  | | | | | | | | | | | | | | |
| **ANNUALIZED CAPITAL COSTS** | | | | |  |  |  |  |  |  |  |  |  |
|  | *CEMS costs for Tier 4 units* 49,50 | | | |  | 1.8 |  | 6 |  |  |  |  | $181,955 |
|  | | | | | | | | | | | | | | |
| **TOTAL ANNUAL COSTS (Labor, O&M, and annualized capital)** | | | | |  |  |  |  |  |  |  |  | $16,059,501 |

# Appendix F-7. Detailed Unit Burden and Costs for GHGRP Reporters Subject to Subpart C Plus Another Subpart(s)—Year 3

| **Year 3** | | | | | (A) Hours per Occurrence | (B) Occurrences/ Respondent/Year | (C) Hours/ Respondent/ | (D) Respondents/ Year | (E) Technical Hours/ | Legal Hours/Year | Clerical Hours/ | Manager Hours/ | (H) Cost/ Year |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Year (A x B) | Year | Year | Year |
|  | (C x D) |  |  |
| **1. APPLICATIONS (Not Applicable)** | | | | |  |  |  |  |  |  |  |  |  |
| **2. SURVEY AND STUDIES (Not Applicable)** | | | | |  |  |  |  |  |  |  |  |  |
| **3. ACQUISITION, INSTALLATION, AND UTILIZATION OF TECHNOLOGY AND SYSTEMS** | | | | |  |  |  |  |  |  |  |  |  |
| **4. REPORT REQUIREMENTS** | | | | |  |  |  |  |  |  |  |  |  |
|  | **A. Read Rule, Instructions, Guidance Documents** 1,2,3 | | | | 5 | 1 | 5 | 4112 | 20,560 |  |  |  | $1,469,012 |
|  | **B. Required Activities** | | | |  |  |  |  |  |  |  |  |  |
|  |  | *Activity covering Tier 1 Methodology* | | |  |  |  |  |  |  |  |  |  |
|  |  |  | Conduct annual review of company records to determine mass or volume of fuel combusted 1,2,4 | | 5 | 1 | 5 | 2015 | 10,073 |  |  |  | $719,680 |
|  |  |  | Conduct annual review of billing records to determine natural gas consumption in therms or mmBtu 1,2,4 | | 5 | 1 | 5 | 555 | 2,775 |  |  |  | $198,240 |
|  |  | *Activity covering Tier 2 Methodology* | | |  |  |  |  |  |  |  |  |  |
|  |  |  | Conduct annual review of billing records to determine natural gas consumption in therms or mmBtu 1,2,5 | | 5 | 1 | 5 | 2167 | 10,837 |  |  |  | $774,324 |
|  |  | *Activity covering Tier 3 Methodology* | | |  |  |  |  |  |  |  |  |  |
|  |  |  | Conduct annual review of company records to determine mass or volume of fuel combusted 1,2,6 | | 5 | 1 | 5 | 277 | 1,387 |  |  |  | $99,120 |
|  |  | *Tier 1 Methodology for combustion emissions reported under subpart C* | | |  |  |  |  |  |  |  |  |  |
|  |  |  | Perform engineering calculation to determine CO2 emissions using Eq C-1, C-1a, or C-1b, using default high heat values and/or default emission factors 4,7,8 | | 0.2 | 2.7 | 0.5 | 2348 | 1,058 |  |  |  | $75,611 |
|  |  |  | Perform engineering calculation to determine CH4 and N2O emissions using Eq C-8, Eq C-8a, or Eq C-8b 4,8,9 | | 0.3 | 2.7 | 0.9 | 2348 | 2,116 |  |  |  | $151,222 |
|  |  | *Tier 2 Methodology for combustion emissions reported under subpart C* | | |  |  |  |  |  |  |  |  |  |
|  |  |  | Conduct sampling to determine high heat value for each type of fuel or fuel mixture 5,10 | |  | 2.6 |  | 2165 |  |  |  |  |  |
|  |  |  |  | Daily measurements 12,13 | 0 | 2.0 | 0.0 | 352 | 0 |  |  |  | $0 |
|  |  |  |  | Hourly measurements 13,14 | 0 | 2.4 | 0.0 | 86 | 0 |  |  |  | $0 |
|  |  |  |  | Monthly measurements 15,16 | 6 | 2.8 | 16.8 | 1119 | 18,831 |  |  |  | $1,345,489 |
|  |  |  |  | Quarterly measurements 17,18 | 2 | 2.3 | 4.6 | 151 | 696 |  |  |  | $49,726 |
|  |  |  |  | Semiannual measurements 19,20 | 1 | 1.7 | 1.7 | 210 | 364 |  |  |  | $25,982 |
|  |  |  |  | Weekly measurements 21,22 | 26 | 2.0 | 51.4 | 49 | 2,531 |  |  |  | $180,838 |
|  |  |  |  | Other measurement methods 15,23 | 6 | 8.0 | 47.8 | 197 | 9,404 |  |  |  | $671,922 |
|  |  |  | Perform engineering calculation to determine CO2 emissions using Eq C-2a, along with Eq C-2b or Eq C-2c. 5,7,10 | | 0.2 | 2.6 | 0.4 | 2167 | 947 |  |  |  | $67,690 |
|  |  |  | Perform engineering calculation to determine CH4 and N2O emissions using Eq C-9a or Eq 9b 5,9,10 | | 0.3 | 2.6 | 0.9 | 2167 | 1,895 |  |  |  | $135,380 |
|  |  | *Tier 3 Methodology for combustion emissions reported under subpart C* | | |  |  |  |  |  |  |  |  |  |
|  |  |  | Conduct sampling to determine carbon content for each type of fuel or fuel mixture 6,24 | |  | 6.3 |  | 277 |  |  |  |  |  |
|  |  |  |  | Daily measurements 13,25 | 0 | 6.9 | 0.0 | 61 | 0 |  |  |  | $0 |
|  |  |  |  | Hourly measurements 13,26 | 0 | 12.3 | 0.0 | 10 | 0 |  |  |  | $0 |
|  |  |  |  | Monthly measurements 15,27 | 6 | 3.4 | 20.2 | 76 | 1,539 |  |  |  | $109,952 |
|  |  |  |  | Quarterly measurements 17,28 | 2 | 1.9 | 3.8 | 12 | 48 |  |  |  | $3,406 |
|  |  |  |  | Semiannual measurements 19,29 | 1 | 1.0 | 1.0 | 5 | 5 |  |  |  | $341 |
|  |  |  |  | Weekly measurements 21,30 | 26 | 7.0 | 181.6 | 71 | 12,816 |  |  |  | $915,721 |
|  |  |  |  | Other measurement methods 15,31 | 6 | 4.0 | 24.0 | 43 | 1,030 |  |  |  | $73,574 |
|  |  |  | Determine annual volume of liquid or gaseous fuel using fuel flow meters 32,33,34 | | 0.5 | 5.9 | 2.9 | 231 | 678 |  |  |  | $48,431 |
|  |  |  | Determine annual average molecular weight of gaseous fuel 32,35,36 | | 0.5 | 5.8 | 2.9 | 218 | 627 |  |  |  | $44,833 |
|  |  |  | Perform engineering calculation to determine CO2 emissions using Eq C-3, Eq C-4, or Eq C-5. 6,7,24 | | 0.2 | 6.3 | 1.1 | 277 | 292 |  |  |  | $20,897 |
|  |  |  | Perform engineering calculation to determine CH4 and N2O emissions using Eq C-8 6,9,24 | | 0.3 | 6.3 | 2.1 | 277 | 585 |  |  |  | $41,794 |
|  |  | *Tier 4 Methodology for combustion emissions reported under subpart C* | | |  |  |  |  |  |  |  |  |  |
|  |  |  | Gather CEMS data for e-GGRT reporting 37,38 | | 20 | 4 | 80 | 75 | 5,976 |  |  |  | $426,979 |
|  |  | *Alternative Part 75 Methodology for combustion emissions reported under subpart C* | | |  |  |  |  |  |  |  |  |  |
|  |  |  | Perform engineering calculation to determine CO2 emissions using Appendix D and G (98.33(a)(5)(i)), LME calculation method (98.33(a)(5)(ii), or CEMS calculation method (98.33(a)(5)(iii)) 7,39 | | 0.2 | 3.9 | 0.7 | 37 | 24 |  |  |  | $1,723 |
|  | **C. Create Information (Included in 4B)** | | | |  |  |  |  |  |  |  |  |  |
|  | **D. Gather Existing Information (Included in 4E)** | | | |  |  |  |  |  |  |  |  |  |
|  | **E. Write Report** | | | |  |  |  |  |  |  |  |  |  |
|  |  |  | Annual Compliance Reporting through e-GGRT and QA 3,40 | | 10 | 1 | 10 | 4,112 | 41,120 |  | 4112 | 4112 | $3,446,802 |
| **5. RECORDKEEPING REQUIREMENTS** | | | | |  |  |  |  |  |  |  |  |  |
|  | **A. Read Instructions (Included in 4A)** | | | |  |  |  |  |  |  |  |  |  |
|  | **B. Plan Activities (Included in 4B)** | | | |  |  |  |  |  |  |  |  |  |
|  | **C. Implement Activities (Included in 4B)** | | | |  |  |  |  |  |  |  |  |  |
|  | **D. Recordkeeping** 3,41 | | | | 5 | 1 | 5 | 4,112 | 20,560 |  | 2056 | 2056 | $1,723,401 |
|  | **E. Time to Transmit or Disclose Information (included in 4E)** | | | |  |  |  |  |  |  |  |  |  |
|  | **F. Time to Train Personnel (included in 4A)** | | | |  |  |  |  |  |  |  |  |  |
|  | **G. Time for Audits (Not Applicable)** | | | |  |  |  |  |  |  |  |  |  |
| **TOTAL ANNUAL LABOR BURDEN AND COST** | | | | |  |  |  |  | 168,774 |  | 6168 | 6168 | $12,822,088 |
|  | | | | | | | | | | | | | | |
| **ANNUAL TESTING COSTS (O&M)** | | | | |  |  |  |  |  |  |  |  |  |
|  | *Sampling costs for Tier 2 units* | | | |  |  |  |  |  |  |  |  |  |
|  |  | Monthly samples and analyses 16 | | |  | 2.8 |  | 1,119 |  |  |  |  | $1,255,413 |
|  |  | Quarterly samples and analyses 18 | | |  | 2.3 |  | 151 |  |  |  |  | $139,192 |
|  |  | Semiannual samples and analyses 20 | | |  | 1.7 |  | 210 |  |  |  |  | $145,458 |
|  |  | Weekly samples and analyses 22 | | |  | 2.0 |  | 49 |  |  |  |  | $38,938 |
|  |  | Other measurement methods samples and analyses 23 | | |  | 8.0 |  | 197 |  |  |  |  | $626,939 |
|  | *Sampling costs for Tier 3 units 6,13,24,43* | | | |  |  |  |  |  |  |  |  |  |
|  |  | Monthly samples and analyses 27 | | |  | 3.4 |  | 76 |  |  |  |  | $102,591 |
|  |  | Quarterly samples and analyses 28 | | |  | 1.9 |  | 12 |  |  |  |  | $9,534 |
|  |  | Semiannual samples and analyses 29 | | |  | 1.0 |  | 5 |  |  |  |  | $1,907 |
|  |  | Weekly samples and analyses 30 | | |  | 7.0 |  | 71 |  |  |  |  | $197,173 |
|  |  | Other measurement methods samples and analyses 31 | | |  | 4.0 |  | 43 |  |  |  |  | $68,648 |
|  | *Flow meter costs for Tier 3 units* 44,45 | | | |  | 5.9 |  | 9 |  |  |  |  | $127,389 |
|  | *Sampling costs for Biogenic Testing* | | | |  |  |  |  |  |  |  |  |  |
|  |  | Annual gas samples and analyses 46,47 | | |  | 4.0 |  | 34 |  |  |  |  | $778,482 |
|  | *Recordkeeping 48* | | | |  | 1 |  | 4,112 |  |  |  |  | $205,600 |
|  | | | | | | | | | | | | | | |
| **ANNUALIZED CAPITAL COSTS** | | | | |  |  |  |  |  |  |  |  |  |
|  | *CEMS costs for Tier 4 units* 49,50 | | | |  | 1.8 |  | 9 |  |  |  |  | $272,932 |
|  | | | | | | | | | | | | | | |
| **TOTAL ANNUAL COSTS (Labor, O&M, and annualized capital)** | | | | |  |  |  |  |  |  |  |  | $16,792,284 |

# Appendix F-8. Footnotes Applicable to Appendix F-5, Appendix F-6, and Appendix F-7

|  |
| --- |
| Note: Figures may not add exactly due to rounding. |
| 1 Assumed 5 hours per reporter per year to read rule. |
| 2 Assumed activity occurs once per year per reporter. |
| 3 There are 3468 facilities that reported subpart C plus another subpart(s) in RY2017, with an additional 161 new reporters per year. |
| 4 There are 1980 facilities that reported subpart C plus another subpart(s) under Tier 1 in RY2017, with an additional 92 new reporters per year. 1857 of those facilities reported using Eq C-1 and 511 facilities reported using Eq C-1a and/or Eq C-1b. |
| 5 There are 1828 facilities that reported subpart C plus another subpart(s) under Tier 2 in RY2017, with an additional 85 new reporters per year. 1996 of those facilities reported using Eq C-2a and 3 facilities reported using Eq C-2c. |
| 6 There are 234 facilities that reported subpart C plus another subpart(s) under Tier 3 in RY2017, with an additional 11 new reporters per year. 56 of those facilities reported using Eq C-3, 12 facilities reported using Eq C-4, and 201 facilities reported using Eq C-5. |
| 7 Assumed 10 minutes per pollutant per fuel [1 pollutant]. |
| 8 Using RY2017 data, there are 0.18 fuels per facility using Eq C-1a; 0.15 fuels per facility using Eq C-1b; 2.37 fuels per facility using Eq. C-1. |
| 9 Assumed 10 minutes per pollutant per fuel [2 pollutants]. |
| 10 Using RY2017 data, there are 2.62 fuels per facility using Eq C-2a and 0.002 fuels per facility using Eq C-2c. |
| 11 [reserved] |
| 12 Using RY2017 data, 16% of Tier 2 Eqn. C-2a facilities perform daily measurements for an average of 2 fuels per facility. |
| 13 Assumed that hourly and daily sampling is done automatically via continuous, on-line equipment and, therefore, no lab analyses are required. |
| 14 Using RY2017 data, 4% of Tier 2 Eq C-2a facilities perform hourly measurements for an average of 2.4 fuels per facility. |
| 15 Assumed 0.5 hour per fuel and 12 measurements per year. |
| 16 Using RY2017 data, 52% of Tier 2 Eq C-2a facilities perform monthly measurements for an average of 2.8 fuels per facility. |
| 17 Assumed 0.5 hour per fuel and 4 measurements per year. |
| 18 Using RY2017 data, 7% of Tier 2 Eq C-2a facilities perform quarterly measurements for an average of 2.3 fuels per facility. |
| 19 Assumed 0.5 hour per fuel and 2 measurements per year. |
| 20 Using RY2017 data, 9.7% of Tier 2 Eq C-2a facilities perform semiannual measurements for an average of 1.7 fuels per facility. |
| 21 Assumed 0.5 hour per fuel and 52 measurements per year. |
| 22 Using RY2017 data, 2.3% of Tier 2 Eq C-2a facilities perform weekly measurements for an average of 2 fuels per facility. |
| 23 Other measurement methods include once per fuel lot, upon addition of oil to the storage tank, and other specified measurement methods. Using RY2017 data, 9% of Tier 2 C-2a facilities perform measurements at one of these frequencies for an average of 8 fuels per facility. |
| 24 Using RY2017 data, there are 6.32 fuels per respondent using Tier 3 methodology. |
| 25 Using RY2017 data, 22% of Tier 3 facilities perform daily measurements for an average of 6.9 fuel per facility. |
| 26 Using RY2017 data, 3.4% of Tier 3 facilities perform hourly measurements for an average of 12.3 fuel per facility. |
| 27 Using RY2017 data, 27% of Tier 3 facilities perform monthly measurements for an average of 3.4 fuel per facility. |
| 28 Using RY2017 data, 4.5% of Tier 3 facilities perform quarterly measurements for an average of 1.9 fuel per facility. |
| 29 Using RY2017 data, 1.7% of Tier 3 facilities perform semiannual measurements for an average of 1 fuel per facility. |
| 30 Using RY2017 data, 25% of Tier 3 facilities perform weekly measurements for an average of 7 fuel per facility. |
| 31 Other measurement methods include once per fuel lot, upon addition of oil to the storage tank, and other specified measurement methods. Using RY2017 data, 15% of Tier 3 facilities perform measurements at one of these frequencies for an average of 4 fuel per facility. |
| 32 Assumed 0.5 hours per fuel to determine the annual volume of fuel or annual average molecular weight of gaseous fuel. |
| 33 Using RY2017 data, there are 5.86 liquid or gaseous fuels per respondent using Tier 3 methodology. |
| 34 Using RY2017 data, there are 195 facilities reporting subpart C plus another subpart(s) which used liquid or gaseous fuel, with an additional 9 new reporters per year. |
| 35 Using RY2017 data, there are 5.75 gaseous fuels per respondent using Tier 3 methodology. |
| 36 Using RY2017 data, there are 184 facilities reporting subpart C plus another subpart(s) used gaseous fuel, with an additional 9 new reporters per year. |
| 37 Assumed 20 hours per quarter to gather and QA the CEMS data. |
| 38 Using RY2017 data, there are 63 facilities reporting subpart C plus another subpart(s) used Tier 4, with an additional 3 new reporters per year. |
| 39 Using RY2017 data, there are 31 facilities reporting subpart C plus another subpart(s) used Alternative Part 75 methodology, with an additional 1 new reporter per year. There are 3.94 fuels per Alternative Part 75 facility. |
| 40 Assumed 10 technical hours, 1 clerical hour, and 1 manager hour per reporter per year to submit report through e-GGRT and QA the data. |
| 41 Assumed 5 technical hours, 0.5 clerical hours, and 0.5 manager hours per reporter per year to maintain records. |
| 42 Number of occurrences per respondent based on average number of fuels reported for Tier 2 C-2a units in RY2017. |
| 43 Assumed testing cost of $400 per fuel. |
| 44 Number of occurrences per respondent based on average number of fuels reported by segment for new Tier 3 C-4 and C-5 units in RY2017. Assumed meter is installed upon startup of new units. |
| 45 Assumed capital cost of $2,400 per fuel per flow meter. |
| 46 Number of occurrences per respondent based on average number of units with reported biogenic testing results per reporter in RY2017. |
| 47 Assumed testing cost of $5660 per unit. Assumed that direct emissions measurements infrastructure is already installed (e.g., ports and platforms). |
| 48 Assumed $50 per reporter per year, which includes the cost of file cabinets, hard drives, and cloud file storage for the GHGRP records required to be maintained. |
| 49 Number of occurrences per respondent based on average number of units reported per facility for new Tier 4 facilities in RY2017. Assumed facilities with units installed before Year 1 of this ICR have completed their annualized capital payments. |
| 50 Assumed capital cost of $124,000 per unit per CEMS device, which is an annualized cost of $17,654.81 (annualized at 10 years, 7% interest). Assumed new Tier 4 reporters would add both a CO2 analyzer and a volumetric flow monitor to an existing CEMS device. |

# Appendix F-9. Summary of Burden and Costs for General Stationary Combustion Sources to Comply with Subpart C – by Year

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year** | **No. Respondents** | **Total Labor Cost** | **Capital Cost** | **O&M Cost** | **Total Cost** |
| Year 1 | 5,788 | $17,649,187 | $206,007 | $3,529,895 | $23,248,989 |
| Year 2 | 6,044 | $18,428,476 | $412,014 | $3,682,063 | $24,467,704 |
| Year 3 | 6,300 | $19,207,766 | $618,021 | $3,834,232 | $25,686,418 |
| **Total** | **18,132** | **$55,285,429** | **$1,236,042** | **$11,046,190** | **$73,403,112** |
| **Average** | **6,044** | **$18,428,476** | **$412,014** | **$3,682,063** | **$24,467,704** |