**Supporting Information for: An assessment of important SPECIATE profiles in the EPA emissions modeling platform and current data gaps**

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**S1. Introduction**

As described in the methodology section of this work, this needs assessment was completed by assessing the quality of each individual profile that is prominent in version 1 of the 2014 US EPA emissions modeling platform. This Supporting Information shows the results of this needs assessment analysis and describes each profile in detail to help provide a better understanding of what is currently used in the modeling platform and how improvements, if necessary, can be made. Section 2 describes each emission source profile and the points assigned to said profile, while Section 3 describes recommendations for the improvement of each profile.

**S2. Q-score Criteria**

This section describes the critical review process for the addition of new profiles to the SPECIATE database. Papers being considered for addition into the SPECIATE database go through a rating process in which they are rated ‘excellent,’ ‘good,’ ‘fair’ or ‘poor’ based on their Quality score (‘Q-score’) using the criteria and point system outlined in Table S1. A Q-score ranging from 20-30 is considered ‘excellent,’ a score from 12 to 19 is ‘good,’ a score of 5-11 is ‘fair’ and a score <4 is ‘poor.’

**Table S1**. Q-score criteria.

|  |  |  |
| --- | --- | --- |
|  | Criteria | Possible Points |
| Data from measurements | Are data from a peer-reviewed publication? | 1 |
| Is the source U.S. based and does it relate to an NEI source? | 1 |
| Is the author well known or affiliated with a well-known institute (i.e., EPA)? | 1 |
| Is the source a relatively new dataset, specifically, is the paper from year 2000 or later? | 1 |
| Is subject source identified from “PRIORITY NEEDS” review?\* | 1 |
| Were data collected under an established quality system or sufficiently addressed /are QA/QC activities associated with the data collection/measurements included in the publication or supplementary information? | 1 |
| Sampling Design | Is the sampling design discussed logically (logic behind the experiments)? | 1 |
| Are the data limitations clear (i.e., can the reviewer easily figure them out or are they explicitly stated)? | 1 |
| Are assumptions clearly stated? (e.g., fireplace is representative of typical fireplace found throughout the country) | 1 |
| Are samples capturing the natural variability of the sources? | 1 |
| Measurement Methodologies | Is measurement instrumentation presented or referenced? | 1 |
| Are the data limitations clear? | 1 |
| Were measurements taken using standard methods (EPA, NIST), and applicable/up-to-date technologies, methods, and instrumentation? | 1 |
| Are measurements done in duplicates or triplicates? | 1 |
| Data work up (statistics) | Are standard deviations presented in the paper? | 1 |
| Are Standard deviations acceptable for the type of source and pollutants measured? | 1 |
| Is the data ready for listing? \*\* | 1 |
| Is there complete speciation data of PM or VOC provided? | 1-10 |
|  | The overall evaluation should ask; is the paper transparent with regards to describing sampling, test methods and data manipulation? Did the clarity and purpose of this paper leave a positive impression. | 1-3 |

\*i.e. is it a priority need based on this work?

\*\*i.e., Data are already in emission factor form, not in need of conversion or clarification; units consistently used throughout the publication; appropriate number of significant figures reported?

**S3. Emission Source Profiles**

This section describes each individual emission source profile for both PM2.5 and VOC emission source categories and the points applied to each region based on the criteria ranking system developed. For each profile, points were only calculated in regions of the country for which > 1% of PM2.5 emissions mass was assigned to that profile >2% of VOC emission mass was assigned to that profile or for which > 2% of VOC reactivity was assigned to that profile. Because this analysis only takes into account those profiles that are worth >1% PM2.5 emission mass and >2% VOC emission mass/reactivity in each region, a profile that is prominent in one region may not necessarily be prominent in another region. However, this does not mean that a profile is not applied to that particular region in the EPA emissions modeling platform. Furthermore, because the reactivity weighted emissions are different than the mass weighted emissions for each profile for each region, the prominent profiles for each region may differ for the mass weighted versus reactivity weighted analyses. The top 3 emission source profiles for PM2.5 mass, VOC mass and VOC reactivity are represented in Tables S2-S4, resepectively.

**Table S2.** Top three PM2.5 emission source profiles in each region and nationwide based on emitted PM2.5 mass. The following abbreviations were used to represent US regions: NE = Northeast, SE = Southeast, OV = Ohio Valley, UM = Upper Midwest, S = South, NRP = Northern Rockies and Plains, SW = Southwest, W = West, NW = Northwest.

|  |  |  |
| --- | --- | --- |
| **Region** | **Profile** | **% of Total Emission Mass** |
| National | 91102 - Wildfires - Composite | 22.8 |
| 91109 - Prescribed Burning - Composite | 20.5 |
| 91105 - Residential Wood Combustion - Composite | 8.8 |
| OV | 91109 - Prescribed Burning - Composite | 16.8 |
| 91110 - Sub-Bituminous Combustion - Composite | 15.7 |
| 91105 - Residential Wood Combustion - Composite | 11.6 |
| UM | 91105 - Residential Wood Combustion - Composite | 30.8 |
| 91109 - Prescribed Burning - Composite | 13.6 |
| 91101 - Agricultural Soil - Composite | 11.4 |
| NE | 91105 - Residential Wood Combustion - Composite | 27.3 |
| 91116 - Charbroiling - Composite | 17.7 |
| 91103 - Agricultural Burning - Composite | 12.1 |
| NW | 91102 - Wildfires - Composite | 56.6 |
| 91109 - Prescribed Burning - Composite | 18.8 |
| 91105 - Residential Wood Combustion - Composite | 6.0 |
| S | 91109 - Prescribed Burning - Composite | 31.2 |
| 91102 - Wildfires - Composite | 12.2 |
| 91100 - Unpaved Road Dust - Composite | 10.1 |
| SE | 91109 - Prescribed Burning - Composite | 38.8 |
| 91114 - Wood Fired Boiler - Composite | 13.8 |
| 91103 - Agricultural Burning - Composite | 13.1 |
| SW | 91102 - Wildfires - Composite | 21.9 |
| 91109 - Prescribed Burning - Composite | 14.1 |
| 91100 - Unpaved Road Dust - Composite | 10.4 |
| W | 91102 - Wildfires - Composite | 71.4 |
| 91109 - Prescribed Burning - Composite | 6.4 |
| 91103 - Agricultural Burning - Composite | 5.5 |
| NRP | 91109 - Prescribed Burning - Composite | 26.8 |
| 91101 - Agricultural Soil - Composite | 23.4 |
| 91100 - Unpaved Road Dust - Composite | 11.1 |

**Table S3.** Top three VOC emission source profiles in each region applied in the EPA emissions modeling platform based on emitted VOC mass. The following abbreviations were used to represent US regions: NE = Northeast, SE = Southeast, OV = Ohio Valley, UM = Upper Midwest, S = South, NRP = Northern Rockies and Plains, SW = Southwest, W = West, NW = Northwest.

|  |  |  |
| --- | --- | --- |
| **Region** | **Profile** | **% of Total Emission Mass** |
| National | 95422 - Composite Profile - Prescribed fire southwest conifer forest | 12.02 |
| 2487 - Composite of 7 Emission Profiles from Crude Oil Storage Tanks - 1993 | 8.73 |
| 95421 - Composite Profile - Prescribed fire southeast conifer forest | 8.45 |
| OV | 95422 - Composite Profile - Prescribed fire southwest conifer forest | 14.71 |
| 8949 - Natural Gas Production | 9.06 |
| 1191 - Graphic Arts - (Printing) | 6.68 |
| UM | 4642 - Fireplace wood combustion - pine wood | 14.03 |
| 95421 - Composite Profile - Prescribed fire southeast conifer forest | 10.43 |
| 95422 - Composite Profile - Prescribed fire southwest conifer forest | 5.17 |
| NE | 8949 - Natural Gas Production | 10.96 |
| 4642 - Fireplace wood combustion - pine wood | 9.24 |
| 8744 - Composite Profile - Architectural Coatings: Solvent Borne and water borne | 6.68 |
| NW | 95424 - Composite Profile - Wildfire northwest conifer forest | 56.87 |
| 95423 - Composite Profile - Prescribed fire northwest conifer forest | 19.08 |
| 3001 - Pesticides | 3.34 |
| S | 2487 - Composite of 7 Emission Profiles from Crude Oil Storage Tanks - 1993 | 17.51 |
| 8949 - Natural Gas Production | 11.67 |
| 95421 - Composite Profile - Prescribed fire southeast conifer forest | 11.23 |
| SE | 95421 - Composite Profile - Prescribed fire southeast conifer forest | 34.29 |
| 95425 - Composite Profile - Wildfire boreal forest | 4.32 |
| 8744 - Composite Profile - Architectural Coatings: Solvent Borne and water borne | 4.26 |
| SW | 2487 - Composite of 7 Emission Profiles from Crude Oil Storage Tanks - 1993 | 11.24 |
| 95422 - Composite Profile - Prescribed fire southwest conifer forest | 11.11 |
| 95417 - Oil and Gas Production - Composite Profile - Untreated Natural Gas, Uinta Basin | 6.66 |
| W | 95422 - Composite Profile - Prescribed fire southwest conifer forest | 65.53 |
| 2487 - Composite of 7 Emission Profiles from Crude Oil Storage Tanks - 1993 | 7.42 |
| 1191 - Graphic Arts - (Printing) | 2.72 |
| NRP | 2487 - Composite of 7 Emission Profiles from Crude Oil Storage Tanks - 1993 | 30.43 |
| 95423 - Composite Profile - Prescribed fire northwest conifer forest | 14.73 |
| 1011 - Oil and Gas Production - Fugitives - Valves and Fittings - Liquid Service | 12.76 |

**Table S4.** Top three VOC emission source profiles applied nationally and regionally based on emissions reactivity. The following abbreviations were used to represent US regions: NE = Northeast, SE = Southeast, OV = Ohio Valley, UM = Upper Midwest, S = South, NRP = Northern Rockies and Plains, SW = Southwest, W = West, NW = Northwest.

|  |  |  |
| --- | --- | --- |
| **Region** | **Profile** | **% of Total Emission Mass** |
| National | 95422 - Composite Profile - Prescribed fire southwest conifer forest | 14.68 |
| 95421 - Composite Profile - Prescribed fire southeast conifer forest | 10.68 |
| 95425 - Composite Profile - Wildfire boreal forest | 6.99 |
| OV | 95422 - Composite Profile - Prescribed fire southwest conifer forest | 18.13 |
| 4642 - Fireplace wood combustion - pine wood | 7.99 |
| 95425 - Composite Profile - Wildfire boreal forest | 7.24 |
| UM | 4642 - Fireplace wood combustion - pine wood | 22.96 |
| 95421 - Composite Profile - Prescribed fire southeast conifer forest | 11.96 |
| 95422 - Composite Profile - Prescribed fire southwest conifer forest | 5.73 |
| NE | 4642 - Fireplace wood combustion - pine wood | 16.70 |
| 0121 - Open Burning Dump - Landscape/Pruning | 7.02 |
| 8949 - Natural Gas Production | 6.56 |
| NW | 95424 - Composite Profile - Wildfire northwest conifer forest | 58.91 |
| 95423 - Composite Profile - Prescribed fire northwest conifer forest | 19.85 |
| 4642 - Fireplace wood combustion - pine wood | 3.71 |
| S | 95421 - Composite Profile - Prescribed fire southeast conifer forest | 15.40 |
| 2487 - Composite of 7 Emission Profiles from Crude Oil Storage Tanks - 1993 | 13.11 |
| 95422 - Composite Profile - Prescribed fire southwest conifer forest | 13.08 |
| SE | 95421 - Composite Profile - Prescribed fire southeast conifer forest | 39.41 |
| 0121 - Open Burning Dump - Landscape/Pruning | 5.24 |
| 8869 - Gasoline Headspace Vapor - 0% Ethanol (E0) Combined - EPAct/V2/E-89 Program | 4.80 |
| SW | 95422 - Composite Profile - Prescribed fire southwest conifer forest | 15.94 |
| 2487 - Composite of 7 Emission Profiles from Crude Oil Storage Tanks - 1993 | 9.12 |
| 95417 - Oil and Gas Production - Composite Profile - Untreated Natural Gas, Uinta Basin | 4.84 |
| W | 95422 - Composite Profile - Prescribed fire southwest conifer forest | 71.40 |
| 2487 - Composite of 7 Emission Profiles from Crude Oil Storage Tanks - 1993 | 4.58 |
| 0121 - Open Burning Dump - Landscape/Pruning | 2.61 |
| NRP | 2487 - Composite of 7 Emission Profiles from Crude Oil Storage Tanks - 1993 | 25.30 |
| 95423 - Composite Profile - Prescribed fire northwest conifer forest | 21.00 |
| 1011 - Oil and Gas Production - Fugitives - Valves and Fittings - Liquid Service | 10.39 |

*S3.1 PM2.5 Emission Source Profiles*

The prominent (i.e. greater than 1% of the total emissions mass applied in the modeling platform) PM2.5 emission source profiles are all composite profiles developed by Reff et al. (2009). Because Reff et al. (2009) went through the peer-review process, the composite profiles created each received 0 points for the ‘Level of Documentation’ criterion. Table S5 shows the points applied to each region for each profile, as well as the regional total score for each profile.

**Table S5.** Individual regional rankings for PM2.5 emission source profiles. The following abbreviations were used to represent US regions: NE = Northeast, SE = Southeast, OV = Ohio Valley, UM = Upper Midwest, S = South, NRP = Northern Rockies and Plains, SW = Southwest, W = West, NW = Northwest.

| **Profile** | **Representativeness of source** | | **Level of Documentation** | | | **Inventory source matches tested source** | | **Percent of weight assigned** | | **Error/**  **discrepancy**  **in data?** | | **Study region applicable?** | | | **Regional Total** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **91100**  **Unpaved Road Dust - Composite** | | | | | | |  | |  | | | |  | | |
| OV | 0 | | 0 | | | 0 | | 2 | | 0 | | 0 | | | 2 |
| UM | 0 | | 0 | | | 0 | | 2 | | 0 | | 0 | | | 2 |
| NE | 0 | | 0 | | | 0 | | 0 | | 0 | | 0 | | | 0 |
| NW | 0 | | 0 | | | 0 | | 0 | | 0 | | 1 | | | 1 |
| SE | 0 | | 0 | | | 0 | | 0 | | 0 | | 0 | | | 0 |
| S | 0 | | 0 | | | 0 | | 2 | | 0 | | 0 | | | 2 |
| SW | 0 | | 0 | | | 0 | | 2 | | 0 | | 0 | | | 2 |
| NRP | 0 | | 0 | | | 0 | | 2 | | 0 | | 1 | | | 3 |
| **91101**  **Agricultural Soil - Composite** | | | | |  | | |  | | |  | | |  | |
| OV | | 1 | | 0 | | 1 | | 2 | | 0 | | 1 | | | 5 |
| UM | | 1 | | 0 | | 1 | | 2 | | 0 | | 1 | | | 5 |
| NE | | 1 | | 0 | | 1 | | 0 | | 0 | | 1 | | | 3 |
| NW | | 1 | | 0 | | 1 | | 0 | | 0 | | 1 | | | 3 |
| SE | | 1 | | 0 | | 1 | | 0 | | 0 | | 1 | | | 3 |
| S | | 1 | | 0 | | 1 | | 1 | | 0 | | 1 | | | 4 |
| SW | | 1 | | 0 | | 1 | | 1 | | 0 | | 0 | | | 3 |
| NRP | | 1 | | 0 | | 1 | | 3 | | 0 | | 1 | | | 6 |
| **91102**  **Wildfires - Composite** | | |  | | |  | |  | |  | |  | | |  |
| OV | | 0 | 0 | | | 2 | | 3 | | 2 | | 1 | | | 8 |
| NE | | 0 | 0 | | | 2 | | 0 | | 2 | | 1 | | | 5 |
| NW | | 0 | 0 | | | 2 | | 0 | | 2 | | 1 | | | 5 |
| SE | | 0 | 0 | | | 2 | | 1 | | 2 | | 1 | | | 6 |
| S | | 0 | 0 | | | 2 | | 3 | | 2 | | 0 | | | 7 |
| SW | | 0 | 0 | | | 2 | | 3 | | 2 | | 0 | | | 7 |
| W | | 0 | 0 | | | 2 | | 3 | | 2 | | 1 | | | 8 |
| NRP | | 0 | 0 | | | 2 | | 1 | | 2 | | 1 | | | 6 |
| **91103**  **Agricultural Burning - Composite** | | | | | |  | |  | |  | |  | | |  |
| OV | | 0 | 0 | | | 2 | | 2 | | 0 | | 1 | | | 5 |
| UM | | 0 | 0 | | | 2 | | 1 | | 0 | | 1 | | | 4 |
| NE | | 0 | 0 | | | 2 | | 2 | | 0 | | 1 | | | 5 |
| NW | | 0 | 0 | | | 2 | | 0 | | 0 | | 0 | | | 2 |
| SE | | 0 | 0 | | | 2 | | 3 | | 0 | | 1 | | | 6 |
| S | | 0 | 0 | | | 2 | | 2 | | 0 | | 1 | | | 5 |
| SW | | 0 | 0 | | | 2 | | 1 | | 0 | | 1 | | | 4 |
| W | | 0 | 0 | | | 2 | | 1 | | 0 | | 0 | | | 3 |
| NRP | | 0 | 0 | | | 2 | | 1 | | 0 | | 1 | | | 4 |
| **91105**  **Residential Wood Combustion – Composite** | | | | | | | | | |  | |  | | |  |
| OV | | 1 | 0 | | | 1 | | 2 | | 0 | | 0 | | | 4 |
| UM | | 1 | 0 | | | 1 | | 3 | | 0 | | 0 | | | 5 |
| NE | | 1 | 0 | | | 1 | | 3 | | 0 | | 0 | | | 5 |
| NW | | 1 | 0 | | | 1 | | 0 | | 0 | | 0 | | | 2 |
| SE | | 1 | 0 | | | 1 | | 1 | | 0 | | 0 | | | 3 |
| S | | 1 | 0 | | | 1 | | 0 | | 0 | | 0 | | | 2 |
| SW | | 1 | 0 | | | 1 | | 2 | | 0 | | 0 | | | 4 |
| W | | 1 | 0 | | | 1 | | 0 | | 0 | | 0 | | | 2 |
| NRP | | 1 | 0 | | | 1 | | 0 | | 0 | | 0 | | | 2 |
| **91106**  **HDDV Exhaust - Composite** | | | | | |  | |  | |  | |  | | |  |
| OV | | 1 | 0 | | | 2 | | 0 | | 0 | | 0 | | | 3 |
| UM | | 1 | 0 | | | 2 | | 1 | | 0 | | 0 | | | 4 |
| NE | | 1 | 0 | | | 2 | | 1 | | 0 | | 0 | | | 4 |
| NW | | 1 | 0 | | | 2 | | 0 | | 0 | | 0 | | | 3 |
| SE | | 1 | 0 | | | 2 | | 0 | | 0 | | 0 | | | 3 |
| S | | 1 | 0 | | | 2 | | 0 | | 0 | | 0 | | | 3 |
| SW | | 1 | 0 | | | 2 | | 1 | | 0 | | 0 | | | 4 |
| W | | 1 | 0 | | | 2 | | 0 | | 0 | | 0 | | | 3 |
| NRP | | 1 | 0 | | | 2 | | 1 | | 0 | | 0 | | | 4 |
| **91107**  **Construction Dust - Composite** | | | | | |  | |  | |  | |  | | |  |
| OV | | 1 | 0 | | | 0 | | 0 | | 0 | | 1 | | | 2 |
| **91108**  **Paved Road Dust - Composite** | | | | | | | |  | |  | |  | | |  |
| OV | | 1 | 0 | | | 0 | | 0 | | 0 | | 0 | | | 1 |
| UM | | 1 | 0 | | | 0 | | 0 | | 0 | | 1 | | | 2 |
| NE | | 1 | 0 | | | 0 | | 0 | | 0 | | 1 | | | 2 |
| SE | | 1 | 0 | | | 0 | | 0 | | 0 | | 1 | | | 2 |
| S | | 1 | 0 | | | 0 | | 0 | | 0 | | 0 | | | 1 |
| SW | | 1 | 0 | | | 0 | | 0 | | 0 | | 0 | | | 1 |
| **91109**  **Prescribed Burning - Composite** | | | | | |  | |  | |  | |  | | |  |
| OV | | 0 | 0 | | | 1 | | 3 | | 1 | | 1 | | | 6 |
| UM | | 0 | 0 | | | 1 | | 3 | | 1 | | 1 | | | 6 |
| NE | | 0 | 0 | | | 1 | | 0 | | 1 | | 1 | | | 3 |
| NW | | 0 | 0 | | | 1 | | 0 | | 1 | | 0 | | | 2 |
| SE | | 0 | 0 | | | 1 | | 3 | | 1 | | 0 | | | 5 |
| S | | 0 | 0 | | | 1 | | 3 | | 1 | | 1 | | | 6 |
| SW | | 0 | 0 | | | 1 | | 3 | | 1 | | 1 | | | 6 |
| W | | 0 | 0 | | | 1 | | 2 | | 1 | | 1 | | | 5 |
| NRP | | 0 | 0 | | | 1 | | 3 | | 1 | | 1 | | | 6 |
| **91110**  **Sub-Bituminous Combustion - Composite** | | | | | | | |  | |  | |  | | |  |
| OV | | 1 | 0 | | | 2 | | 3 | | 1 | | 0 | | | 7 |
| UM | | 1 | 0 | | | 2 | | 0 | | 1 | | 0 | | | 4 |
| NE | | 1 | 0 | | | 2 | | 0 | | 1 | | 0 | | | 4 |
| NW | | 1 | 0 | | | 2 | | 0 | | 1 | | 0 | | | 4 |
| S | | 1 | 0 | | | 2 | | 0 | | 1 | | 0 | | | 4 |
| SW | | 1 | 0 | | | 2 | | 1 | | 1 | | 0 | | | 5 |
| NRP | | 1 | 0 | | | 2 | | 1 | | 1 | | 0 | | | 5 |
| **91112**  **Natural Gas Combustion - Composite** | | | | | | | |  | |  | |  | | |  |
| OV | | 0 | 0 | | | 2 | | 0 | | 1 | | 0 | | | 3 |
| UM | | 0 | 0 | | | 2 | | 0 | | 1 | | 0 | | | 3 |
| NE | | 0 | 0 | | | 2 | | 0 | | 1 | | 0 | | | 3 |
| SE | | 0 | 0 | | | 2 | | 0 | | 1 | | 0 | | | 3 |
| S | | 0 | 0 | | | 2 | | 0 | | 1 | | 0 | | | 3 |
| SW | | 0 | 0 | | | 2 | | 0 | | 1 | | 0 | | | 3 |
| W | | 0 | 0 | | | 2 | | 0 | | 1 | | 0 | | | 3 |
| **91113**  **Nonroad Gasoline Exhaust - Composite** | | | | | | | |  | |  | |  | | |  |
| OV | | 1 | 0 | | | 2 | | 0 | | 1 | | 0 | | | 4 |
| UM | | 1 | 0 | | | 2 | | 0 | | 1 | | 0 | | | 4 |
| NE | | 1 | 0 | | | 2 | | 0 | | 1 | | 0 | | | 4 |
| SE | | 1 | 0 | | | 2 | | 0 | | 1 | | 0 | | | 4 |
| SW | | 1 | 0 | | | 2 | | 0 | | 1 | | 0 | | | 4 |
| W | | 1 | 0 | | | 2 | | 0 | | 1 | | 0 | | | 4 |
| **91114**  **Wood Fired Boiler - Composite** | | | | | |  | |  | |  | |  | | |  |
| OV | | 1 | 0 | | | 2 | | 0 | | 0 | | 0 | | | 3 |
| UM | | 1 | 0 | | | 2 | | 1 | | 0 | | 0 | | | 4 |
| NW | | 1 | 0 | | | 2 | | 0 | | 0 | | 0 | | | 3 |
| S | | 1 | 0 | | | 2 | | 0 | | 0 | | 0 | | | 3 |
| **91116**  **Charbroiling - Composite** | | | | | | | |  | |  | |  | | |  |
| OV | | 0 | 0 | | | 0 | | 0 | | 0 | | 0 | | | 0 |
| UM | | 0 | 0 | | | 0 | | 0 | | 0 | | 0 | | | 0 |
| NE | | 0 | 0 | | | 0 | | 1 | | 0 | | 0 | | | 1 |
| SE | | 0 | 0 | | | 0 | | 0 | | 0 | | 0 | | | 0 |
| S | | 0 | 0 | | | 0 | | 0 | | 0 | | 0 | | | 0 |
| SW | | 0 | 0 | | | 0 | | 1 | | 0 | | 0 | | | 1 |
| **91120**  **Mineral Products - Avg - Composite** | | | | | |  | |  | |  | |  | | |  |
| UM | | 1 | 0 | | | 2 | | 0 | | 1 | | 0 | | | 4 |
| NRP | | 1 | 0 | | | 2 | | 0 | | 1 | | 0 | | | 4 |
| **91121**  **Industrial Manufacturing - Avg - Composite** | | | | | | | |  | |  | |  | | |  |
| OV | | 1 | 0 | | | 2 | | 0 | | 1 | | 0 | | | 4 |
| UM | | 1 | 0 | | | 2 | | 0 | | 1 | | 0 | | | 4 |
| S | | 1 | 0 | | | 2 | | 0 | | 1 | | 0 | | | 4 |
| **91125**  **Lignite Combustion - Composite** | | | | | | | |  | |  | |  | | |  |
| S | | 1 | 0 | | | 0 | | 0 | | 0 | | 0 | | | 1 |
| NRP | | 1 | 0 | | | 0 | | 0 | | 0 | | 0 | | | 1 |
| **91145**  **Petroleum Industry - Avg - Composite** | | | | | | | |  | |  | |  | | |  |
| S | | 1 | 0 | | | 2 | | 0 | | 1 | | 0 | | | 4 |

91100 – Unpaved Road Dust – Composite

The composite profile for unpaved road dust was created using the median of several different profiles that were created from samples taken between 1987 and 2002 across much of the US (Colorado, Arizona, Texas, California, Ohio, Illinois) as well as in Mexico (Mexico City). A variety of different unpaved road types were sampled, including a gravel parking lot, a dirt parking lot, a haul road at highway construction, a dirt road, near railroad and other unpaved parking lots and surfaces. This profile primarily received points for the percent of the emission mass assigned in the emissions modeling platform as well as the geographic location of the measurements. The unpaved road dust composite profile was prominent in the Ohio Valley, the Upper Midwest, the Northeast, the Northwest, the Southeast, the South, the Southwest and the Northern Rockies and Plains, with at least one point added for profile prominence in the Ohio Valley, the Upper Midwest, the South the Southwest and for the Northern Rockies and Plains. The measurements are representative of the West, Southwest, South and the Ohio Valley. However, because the profile is also applied in the Northwest and the Northern Rockies and Plains, points were assigned for these two regions because the study region is not applicable. This profile accounts for more than 1% of emissions in 8 regions and points were assigned in each of these regions based on the percent of emitted mass as described in Table 1.

91101 - Agricultural Soil - Composite

The composite profile for agricultural soil is derived from measurements taken between 1987-1990 in 1997 from several different agricultural soil composites (clay loam, silt loam, loamy sand, sandy loam, wheat, barley, cotton, walnut) taken in Colorado, California, Arizona and Mexico City. Because the composition of fertilizers used has slightly changed over the past couple of decades (according to the International Fertilizer Association), this profile received points for source representativeness of current conditions. Because the source classification codes applied to this profile are both crop and animal specific while the measurements are not, points were also given for the ‘Inventory source matches tested source’ category. However, because less than 10% (based on emission mass) of the source classification codes (SCCs) for the emission source profile did not match the tests used to create the profile, only one point was assigned per region. This profile also received points for regional applicability since agricultural soil varies region to region and measurements were made in the Southwest and the West, but applied across the Ohio Valley, the Upper Midwest, the Northeast, the Northwest, the Southeast, the South and the Northern Rockies and Plains. This profile accounts for more than 1% of emissions in 8 regions and points were assigned in each of these regions based on the percent of emitted mass as described in Table 1.

91102 – Wildfire- Composite

The wildfire composite profile is based on two emission source profiles derived from measurements taken in northwestern Colorado in 1995 and from measurements taken in western Texas in 2002. While the SCCs for this profile distinguish between the smoldering and flaming phase of a fire, the profile does not. Since more than 10% of fire emissions come from each of these fire phases, the profile was assigned two points per region for ‘Inventory source matches tested source.’ Because this profile is applied to many regions (Ohio Valley, Northeast, Northwest, Southeast, South, Southwest, West and the Northern Rockies and Plains) and fuel is regionally variable, this profile also received points for its prominence and regional applicability (for each region except the South and the Southwest). Finally, this profile also received points for an error in the dataset since some of the measurements used to create this composite were measurements from the combustion of fence posts, which is not at all representative of a wildfire. This profile accounts for more than 1% of emissions in 8 regions and points were assigned in each of these regions based on the percent of emitted mass as described in Table 1.

91103 – Agricultural Burning – Composite

The agricultural burning composite profile was created based on PM2.5 emission source profiles that were composed of measurements made between 1988 and 2001 in California and Oregon. The SCCs for this profile are crop specific, while the profile is not. In addition, the SCCs for the combustion of household waste and yard waste are also assigned to this profile, both of which are not representative of an agricultural burn. Because these SCCs account for greater than 10% of the total emissions mass assigned in the platform, the profile was given two points per region. This profile is also applied in all 9 regions and because fuel (crop) types vary by region, the measurements used in the creation of this profile are not entirely representative of some of the regions to which it is applied (i.e. the Ohio Valley, the Upper Midwest, the Northeast, Southeast, the South, the Southwest and the Northern Rockies and Plains). This profile was applied to emissions in 9 regions and points were assigned in each of these regions based on the percent of emitted mass as described in Table 1.

91105 – Residential Wood Combustion – Composite

The residential wood combustion composite profile was created based on measurements taken between 1989 and 2001 in Colorado and California. The profiles used in this composite included fireplace burning of softwoods, hardwoods, oak and pine and wood stove combustion of hardwoods, oak and pine. Because woodstove and fireplace emission control technology has changed in the past few decades, these measurements are likely representative of some of the technology still in use, but not all of it. Therefore, this profile was assigned one point per region for the representativeness of the emission source. This profile accounts for more than 1% of emissions in 9 regions and points were assigned in each of these regions based on the percent of emitted mass as described in Table 1.

91106 – HDDV Exhaust – Composite

This heavy-duty diesel vehicle (HDDV) exhaust emission source composite profile was created based on heavy duty diesel exhaust emissions from a food delivery truck, a dump truck, two busses, a concrete mixer and a garbage hauler taken in the winter of 1997 in Colorado. This profile is based on diesel engine emissions from 1997 and this technology has changed over the past two decades. One point was assigned per region because there is currently a mix of technologies (old and new) being used for this emission source category. This profile is also being applied to a wide range of SCCs, including agricultural equipment (e.g. tractors), construction and mining equipment, locomotives, military aircraft, stationary internal combustion engines, commercial marine vessels and rocket engine testing (Table S6). Because these inappropriate SCCs account for greater than ten percent of profile’s emission mass, two points were assigned per region for this profile. Table S3 show the most prominent SCCs (SCCs that account for greater than 80% of the total profile emission mass) applied to the composite profile based on emission mass. This profile accounts for more than 1% of emissions in 9 regions and points were assigned in each of these regions based on the percent of emitted mass as described in Table 1.

**Table S6.** Prominent SCCs applied to the HDDV Exhaust – Composite emission source profile for PM2.5 in the 2014 EPA emissions modeling platform. SCCs account for greater than 80% of the total emission mass of the profile.

|  |  |  |
| --- | --- | --- |
| **SCC** | **SCC Description** | **% of Profile Mass** |
| 2270005015 | Mobile Sources;Off-highway Vehicle Diesel;Agricultural Equipment;Agricultural Tractors | 19.32 |
| 2285002006 | Mobile Sources;Railroad Equipment;Diesel;Line Haul Locomotives: Class I Operations | 15.81 |
| 2280002200 | Mobile Sources;Marine Vessels, Commercial;Diesel;Underway emissions | 11.03 |
| 2270002066 | Mobile Sources;Off-highway Vehicle Diesel;Construction and Mining Equipment;Tractors/Loaders/Backhoes | 5.09 |
| 2270002072 | Mobile Sources;Off-highway Vehicle Diesel;Construction and Mining Equipment;Skid Steer Loaders | 4.25 |
| 2270002060 | Mobile Sources;Off-highway Vehicle Diesel;Construction and Mining Equipment;Rubber Tire Loaders | 3.02 |
| 2270002069 | Mobile Sources;Off-highway Vehicle Diesel;Construction and Mining Equipment;Crawler Tractor/Dozers | 2.98 |
| 2270002036 | Mobile Sources;Off-highway Vehicle Diesel;Construction and Mining Equipment;Excavators | 2.68 |
| 2275001000 | Mobile Sources;Aircraft;Military Aircraft;Total | 1.92 |
| 2270005020 | Mobile Sources;Off-highway Vehicle Diesel;Agricultural Equipment;Combines | 1.90 |
| 2275050011 | Mobile Sources;Aircraft;General Aviation;Piston | 1.69 |
| 2270006005 | Mobile Sources;Off-highway Vehicle Diesel;Commercial Equipment;Generator Sets | 1.68 |
| 2270002051 | Mobile Sources;Off-highway Vehicle Diesel;Construction and Mining Equipment;Off-highway Trucks | 1.58 |
| 2270002057 | Mobile Sources;Off-highway Vehicle Diesel;Construction and Mining Equipment;Rough Terrain Forklifts | 1.36 |
| 2270003060 | Mobile Sources;Off-highway Vehicle Diesel;Industrial Equipment;AC\\Refrigeration | 1.34 |
| 2275020000 | Mobile Sources;Aircraft;Commercial Aircraft;Total: All Types | 1.28 |
| 28500201 | Internal Combustion Engines;Railroad Equipment;Diesel;Yard Locomotives | 1.21 |
| 2270006025 | Mobile Sources;Off-highway Vehicle Diesel;Commercial Equipment;Welders | 1.05 |
| 2270002015 | Mobile Sources;Off-highway Vehicle Diesel;Construction and Mining Equipment;Rollers | 1.02 |

91107 – Construction Dust – Composite

The construction dust emission source composite profile is created based on measurements taken near construction sites in California, Arizona and Oregon during 1990. The measurements were taken in the West, Southwest and the Northwest while the profile is being applied to the Ohio Valley. Because the composition of dust varies region to region, a point was given for regional applicability. This profile accounts for more than 1% of emissions in 1 region and points were assigned in each of these regions based on the percent of emitted mass as described in Table 1.

91108 - Paved Road Dust – Composite

The paved road dust composite profile is created from profiles representing samples taken between 1987 and 1997 from various regions (Colorado, Ohio, Idaho, Texas, California, Arizona and Illinois) as well as samples from Mexico. Because there have been significant changes in the emissions from vehicles (exhaust, tires, brakes, etc) and land use practices since the profiles used to create this composite were developed, this profile is not likely still representative of current conditions. Therefore, one point was assigned per region for the ‘Representativeness of Source’ category. The composition of dust varies geographically. Therefore, another point was added for regional applicability in the Upper Midwest, the Northeast and the Southeast regions due to a lack of measurements for this region. This profile accounts for more than 1% of emissions in 6 regions and points were assigned in each of these regions based on the percent of emitted mass as described in Table 1.

91109 – Prescribed Burning – Composite

The composite profile for prescribed burning was created using measurements from a variety of different fuel types (loblolly pine, western hemlock, ponderosa pine, mixed hardwood forest, conifer forest, Florida palmetto and slash pine, wiregrass and longleaf pine) from the Southeast and the Northwest. While the SCCs for this profile distinguish between the smoldering and flaming phase of a fire, the profile does not. Since more than 10% of fire emissions come from each of these fire phases, the profile was assigned two points per region for ‘Inventory source matches tested source.’ In addition, because fuel varies region to region, a point was also assigned for applicable study region in the Northern Rockies and Plains, the South, the Ohio Valley, the Upper Midwest, the Southwest, the West and the Northeast. This profile accounts for more than 1% of emissions in 9 regions and points were assigned in each of these regions based on the percent of emitted mass as described in Table 1.

91110 – Sub-Bituminous Combustion – Composite

The sub-bituminous coal combustion profile was created using coal combustion measurements taken from two coal-burning boilers in 1987. One of the boilers was equipped with a baghouse while the other boiler was equipped with mechanical collectors, an electrostatic precipitator and a wet scrubber. Since 1987, several regulations have been passed that have created the need to improve the control technology for the combustion of coal (e.g. the Mercury and Air Toxics Standards). Due to updates in control technology across the EGU fleet since 1987, the typical speciation of emissions is likely to have changed as well. Therefore, this profile was assigned one point for source representativeness per region. A wide range of SCCs were applied to this profile that were both control and fuel specific. In addition to SCCs specific to sub-bituminous fuel, there were also SCCs for anthracite, bituminous coal, petroleum coke, coke and metallurgical coke. Table S7 shows the SCCs that account for the top ~80% of the profile. Two points were assigned for the ‘Inventory source matches tested source’ because less than ten percent of the SCCs applied to the profile matched the source testing done to create this profile. This profile was also assigned one point for a discrepancy in the data per region because the authors of the testing report stated that there is “high uncertainty associated with values” due to substantial variation between the source tests for measurements of sulfate, elemental carbon, organic carbon and metal. This profile accounts for more than 1% of emissions in 7 regions and points were assigned in each of these regions based on the percent of emitted mass as described in Table 1.

**Table S7.** Prominent SCCs applied to the Sub-Bituminous Combustion – Composite emission source profile for PM2.5 in the 2014 EPA emissions modeling platform. SCCs account for ~ 80% of the total emission mass of the profile

|  |  |  |
| --- | --- | --- |
| **SCC** | **SCC Description** | **% of Profile Mass** |
| 10100212 | External Combustion Boilers;Electric Generation;Bituminous Coal, Pulverized;Boiler, Dry Bottom Tangential-fired | 25.31 |
| 10100202 | External Combustion Boilers;Electric Generation;Bituminous Coal, Pulverized;Boiler, Dry Bottom | 23.48 |
| 10100222 | External Combustion Boilers;Electric Generation;Subbituminous Coal, Pulverized;Boiler, Dry Bottom | 12.37 |
| 2102002000 | Stationary Source Fuel Combustion;Industrial;Bituminous/Subbituminous Coal;Total: All Boiler Types | 12.32 |
| 10100226 | External Combustion Boilers;Electric Generation;Subbituminous Coal, Pulverized;Boiler, Dry Bottom Tangential-fired | 6.37 |

91112 – Natural Gas Combustion – Composite

The natural gas combustion emission source composite profile was created using measurements from an oil refinery taken in 2001. A wide range of SCCs are currently being applied to this profile that specify combustor type (e.g. 2 vs 4 cycle lean burn) as well as varying fuel types which may have different sulfur contents and other trace gases (e.g. natural gas, process gas, landfill waste gas). Table S8 shows the SCCs that account for the top ~80% of the emission mass of the profile. Because mismatched SCCs account for greater than 10% of the total profile emission mass, 2 points per region were assigned to the profile. In addition, comments on the Black Carbon Report to Congress suggest that the elemental carbon in this composite profile is too large. Therefore, a point, per region, was assigned to this profile for a discrepancy in data. This profile accounts for more than 1% of emissions in 7 regions and points were assigned in each of these regions based on the percent of emitted mass as described in Table 1.

**Table S8.** Prominent SCCs applied to the Natural Gas Combustion – Composite emission source profile for PM2.5 in the 2014 EPA emissions modeling platform. SCCs account for ~ 80% of the total emission mass of the profile.

|  |  |  |
| --- | --- | --- |
| **SCC** | **SCC Description** | **% of Profile Mass** |
| 20100201 | Internal Combustion Engines;Electric Generation;Natural Gas;Turbine | 24.84 |
| 20200201 | Internal Combustion Engines;Industrial;Natural Gas;Turbine | 5.25 |
| 10200602 | External Combustion Boilers;Industrial;Natural Gas;10-100 Million BTU/hr | 4.79 |
| 10200704 | External Combustion Boilers;Industrial;Process Gas;Blast Furnace Gas | 4.50 |
| 10200601 | External Combustion Boilers;Industrial;Natural Gas;> 100 Million BTU/hr | 4.27 |
| 2103006000 | Stationary Source Fuel Combustion;Commercial/Institutional;Natural Gas;Total: Boilers and IC Engines | 4.21 |
| 10100601 | External Combustion Boilers;Electric Generation;Natural Gas;Boiler, >= 100 Million BTU/hr | 3.51 |
| 20200203 | Internal Combustion Engines;Industrial;Natural Gas;Turbine: Cogeneration | 3.27 |
| 20200252 | Internal Combustion Engines;Industrial;Natural Gas;2-cycle Lean Burn | 2.77 |
| 2102006000 | Stationary Source Fuel Combustion;Industrial;Natural Gas;Total: Boilers and IC Engines | 2.39 |
| 20200202 | Internal Combustion Engines;Industrial;Natural Gas;Reciprocating | 2.17 |
| 10200701 | External Combustion Boilers;Industrial;Process Gas;Petroleum Refinery Gas | 2.15 |
| 20200254 | Internal Combustion Engines;Industrial;Natural Gas;4-cycle Lean Burn | 2.10 |
| 30500311 | Industrial Processes;Mineral Products;Brick Manufacture;Curing and Firing: Gas-fired Tunnel Kilns | 1.76 |
| 50100410 | Waste Disposal;Solid Waste Disposal - Government;Landfill Dump;Waste Gas Destruction: Waste Gas Flares | 1.69 |
| 20100802 | Internal Combustion Engines;Electric Generation;Landfill Gas;Reciprocating | 1.63 |
| 10100604 | External Combustion Boilers;Electric Generation;Natural Gas;Boiler, Tangentially Fired | 1.49 |
| 20200253 | Internal Combustion Engines;Industrial;Natural Gas;4-cycle Rich Burn | 1.43 |
| 10300602 | External Combustion Boilers;Commercial/Institutional;Natural Gas;10-100 Million BTU/hr | 1.38 |
| 30190003 | Industrial Processes;Chemical Manufacturing;Fuel Fired Equipment;Process Heater: Natural Gas | 1.24 |
| 30302352 | Industrial Processes;Primary Metal Production;Taconite Iron Ore Processing;Induration: Grate/Kiln, Gas-fired, Flux Pellets | 1.22 |
| 39000699 | Industrial Processes;In-process Fuel Use;Natural Gas;General | 1.19 |
| 31000414 | Industrial Processes;Oil and Gas Production;Process Heaters;Natural Gas: Steam Generators | 1.08 |

91113 – Nonroad Gasoline Exhaust – Composite

The nonroad gasoline exhaust composite profile is based on measurements taken in 1998 from a 1970 Volkswagen Van-camper and a 1969 Chevrolet Camaro. Based on measurements from the late 1990s and technology from the late 1960s/early 1970s, this profile is not representative of current conditions and therefore, the profile is assigned one point per region for source representativeness. In addition, the profile is extremely general, with a variety of different SCCs currently being applied including internal and external combustion engines, mining and construction equipment, agricultural equipment, lawn and garden equipment, recreation equipment and railway maintenance. Table S9 shows the SCCs that account for the top 80% of the profile emission mass. Because greater than 10% of the SCCs applied to the profile do not match the source measurements used in the creation of this profile, two points were assigned per region to the profile. Finally, the Quality rating for this profile in SPECIATE was an ‘E,’ and thus the profile was assigned one point per region for the ‘Error/Discrepancy in data’ category. This profile accounts for more than 1% of emissions in 6 regions and points were assigned in each of these regions based on the percent of emitted mass as described in Table 1.

**Table S9.** Prominent SCCs applied to the Nonroad Gasoline Exhaust – Composite emission source profile for PM2.5 in the 2014 EPA emissions modeling platform. SCCs account for ~ 80% of the total emission mass of the profile.

|  |  |  |
| --- | --- | --- |
| **SCC** | **SCC Description** | **% of Profile Mass** |
| 2260004021 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Lawn and Garden Equipment;Chain Saws < 6 HP (Commercial) | 12.04 |
| 2260001020 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Recreational Equipment;Snowmobiles | 10.95 |
| 2282005010 | Mobile Sources;Pleasure Craft;Gasoline 2-Stroke;Outboard | 10.35 |
| 2260001010 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Recreational Equipment;Motorcycles: Off-road | 9.06 |
| 2260001030 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Recreational Equipment;All Terrain Vehicles | 8.80 |
| 2260004031 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Lawn and Garden Equipment;Leafblowers/Vacuums (Commercial) | 7.09 |
| 2260004026 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Lawn and Garden Equipment;Trimmers/Edgers/Brush Cutters (Commercial) | 6.09 |
| 2282005015 | Mobile Sources;Pleasure Craft;Gasoline 2-Stroke;Personal Water Craft | 4.92 |
| 2260004025 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Lawn and Garden Equipment;Trimmers/Edgers/Brush Cutters (Residential) | 2.72 |
| 2260002039 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Construction and Mining Equipment;Concrete/Industrial Saws | 2.61 |
| 2260006010 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Commercial Equipment;Pumps | 2.08 |
| 2265001030 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Recreational Equipment;All Terrain Vehicles | 1.95 |
| 2260004020 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Lawn and Garden Equipment;Chain Saws < 6 HP (Residential) | 1.89 |

91114 – Wood Fired Boiler – Composite

The wood fired boiler composite profile was created based on a field test conducted in August 2000 of a wood-fired industrial boiler equipped with an electrostatic precipitator control device. The profile was assigned one point per region for source representativeness due to new regulations being passed on wood fired boilers since 2000. In addition, the SCCs assigned to this profile are industry specific (e.g. electricity generation, industry, commercial/institutional, pulp and paper, solid waste disposal) and in some cases, wood specific, while the profile is not. Because the SCCs that are not directly related to the measurements taken for the profile account for more than 10% of the overall profile mass, two points were assigned per region for the ‘Industry source matches tested source’ category. This profile accounts for more than 1% of emissions in 4 regions and points were assigned in each of these regions based on the percent of emitted mass as described in Table 1.

91116 - Charbroiling – Composite

The charbroiling emission source composite profile for PM2.5 was created using measurements taken between 1997 and 2002 of regular hamburger meat – 21% fat, lean hamburger meat – 10% fat, smoked chicken, charcoal chicken, propane chicken and stir fry steak. This profile accounts for more than 1% of emissions in 6 regions and points were assigned in each of these regions based on the percent of emitted mass as described in Table 1.

91120 – Mineral Products – Avg – Composite

The mineral products average composite emission source profile is an extremely general profile created in 1989 by averaging the original emission source profiles representing the source category group 305xxxxx and then removing the trace elemental values due to the questionable values according to Reff et al. (2009). The profiles were assigned one point per region for source representativeness due to the general nature of this profile and the fact that mismatched SCCs account for over 10% of the overall profile emission mass. Table S10 shows the SCCs that account for the top ~80 % of the profile emission mass. In addition, one point was assigned per region for a discrepancy in the data because the trace elemental values were removed and flagged and the Quality rating in SPECIATE for this profile is an ‘E’. This profile accounts for more than 1% of emissions in 2 regions and points were assigned in each of these regions based on the percent of emitted mass as described in Table 1.

**Table S10.** Prominent SCCs applied to the Mineral Products - Avg – Composite emission source profile for PM2.5 in the 2014 EPA emissions modeling platform. SCCs account for ~ 80% of the total emission mass of the profile.

|  |  |  |
| --- | --- | --- |
| **SCC** | **SCC Description** | **% of Profile Mass** |
| 30501703 | Industrial Processes;Mineral Products;Mineral Wool Manufacturing;Blow Chamber | 9.74 |
| 30501035 | Industrial Processes;Mineral Products;Coal Mining, Cleaning, and Material Handling;Blasting: Coal Overburden | 7.59 |
| 30501022 | Industrial Processes;Mineral Products;Coal Mining, Cleaning, and Material Handling;Drilling/Blasting | 5.96 |
| 2305000000 | Industrial Processes;Mineral Processes: SIC 32;All Processes;Total | 4.77 |
| 30510103 | Industrial Processes;Mineral Products;Bulk Materials Conveyors;Coal | 4.62 |
| 30504131 | Industrial Processes;Mineral Products;Clay processing: Kaolin;Drying, spray dryer | 4.48 |
| 30599999 | Industrial Processes;Mineral Products;Other Not Defined;Specify in Comments Field | 4.37 |
| 30501043 | Industrial Processes;Mineral Products;Coal Mining, Cleaning, and Material Handling;Open Storage Pile: Coal | 3.98 |
| 30501036 | Industrial Processes;Mineral Products;Coal Mining, Cleaning, and Material Handling;Dragline: Overburden Removal | 3.81 |
| 30501009 | Industrial Processes;Mineral Products;Coal Mining, Cleaning, and Material Handling;Raw Coal Storage | 3.41 |
| 30504140 | Industrial Processes;Mineral Products;Clay processing: Kaolin;Calcining, rotary calciner | 2.95 |
| 30510303 | Industrial Processes;Mineral Products;Bulk Materials Open Stockpiles;Coal | 2.38 |
| 30302315 | Industrial Processes;Primary Metal Production;Taconite Iron Ore Processing;Pellet Cooler | 2.32 |
| 30501099 | Industrial Processes;Mineral Products;Coal Mining, Cleaning, and Material Handling;Other Not Classified | 2.05 |
| 30501011 | Industrial Processes;Mineral Products;Coal Mining, Cleaning, and Material Handling;Coal Transfer | 2.02 |
| 30504132 | Industrial Processes;Mineral Products;Clay processing: Kaolin;Drying, apron dryer | 1.82 |
| 30515002 | Industrial Processes;Mineral Products;Calcining;General | 1.74 |
| 30388801 | Industrial Processes;Primary Metal Production;Fugitive Emissions;Specify in Comments Field | 1.48 |
| 30501046 | Industrial Processes;Mineral Products;Coal Mining, Cleaning, and Material Handling;Bulldozing: Coal | 1.24 |
| 2305080000 | Industrial Processes;Mineral Processes: SIC 32;Cut Stone and Stone Products;Total | 1.20 |
| 30302316 | Industrial Processes;Primary Metal Production;Taconite Iron Ore Processing;Pellet Transfer to Storage | 1.08 |
| 30501008 | Industrial Processes;Mineral Products;Coal Mining, Cleaning, and Material Handling;Unloading | 1.00 |
| 30501701 | Industrial Processes;Mineral Products;Mineral Wool Manufacturing;Cupola | 0.80 |
| 30504170 | Industrial Processes;Mineral Products;Clay processing: Kaolin;Product transfer | 0.80 |
| 30501014 | Industrial Processes;Mineral Products;Coal Mining, Cleaning, and Material Handling;Cleaned Coal Storage | 0.78 |
| 30510299 | Industrial Processes;Mineral Products;Bulk Materials Storage Bins;Other Not Classified | 0.77 |
| 30510199 | Industrial Processes;Mineral Products;Bulk Materials Conveyors;Other Not Classified | 0.76 |
| 30302304 | Industrial Processes;Primary Metal Production;Taconite Iron Ore Processing;Ore Transfer | 0.72 |
| 30501799 | Industrial Processes;Mineral Products;Mineral Wool Manufacturing;Other Not Classified | 0.72 |
| 30301301 | Industrial Processes;Primary Metal Production;Gold Processing;General Processes | 0.67 |

91121 – Industrial Manufacturing – Avg – Composite

Similar to SPECIATE profile # 91120, the industrial manufacturing composite profile is also an extremely general profile created in 1989 by averaging the original emission source profiles representing the source category group 3xxxxxxx and then removing the trace elemental values due to the questionable values according to Reff et al. (2009). The profiles were assigned one point per region for source representativeness due to the general nature of this profile and the fact that mismatched SCCs account for over 10% of the overall profile emission mass. Table S11 shows the SCCs that account for the top ~80 % of the profile emission mass. Because the industrial manufacturing emission source category has changed since 1989, one point was assigned per region for source representativeness. In addition, one point was assigned per region for a discrepancy in the data because the trace elemental values were removed and flagged and the Quality rating in SPECIATE for this profile is an ‘E’. This profile accounts for more than 1% of emissions in 3 regions and points were assigned in each of these regions based on the percent of emitted mass as described in Table 1.

**Table S11.** Prominent SCCs applied to the Industrial Manufacturing - Avg – Composite emission source profile for PM2.5 in the 2014 EPA emissions modeling platform. SCCs account for ~ 80% of the total emission mass of the profile.

|  |  |  |
| --- | --- | --- |
| **SCC** | **SCC Description** | **% of Profile Mass** |
| 38500101 | Industrial Processes;Cooling Tower;Process Cooling;Mechanical Draft | 30.70 |
| 39999999 | Industrial Processes;Miscellaneous Manufacturing Industries;Miscellaneous Industrial Processes;Other Not Classified | 7.81 |
| 30901202 | Industrial Processes;Fabricated Metal Products;Precious Metals Recovery;Crucible Furnace | 5.29 |
| 38500110 | Industrial Processes;Cooling Tower;Process Cooling;Other Not Classified | 4.82 |
| 39999992 | Industrial Processes;Miscellaneous Manufacturing Industries;Miscellaneous Industrial Processes;Other Not Classified | 4.12 |
| 30400320 | Industrial Processes;Secondary Metal Production;Grey Iron Foundries;Pouring/Casting | 3.81 |
| 38500102 | Industrial Processes;Cooling Tower;Process Cooling;Natural Draft | 2.78 |
| 30400331 | Industrial Processes;Secondary Metal Production;Grey Iron Foundries;Casting Shakeout | 2.48 |
| 30400303 | Industrial Processes;Secondary Metal Production;Grey Iron Foundries;Electric Induction Furnace | 2.29 |
| 30400325 | Industrial Processes;Secondary Metal Production;Grey Iron Foundries;Castings Cooling | 2.15 |
| 30400708 | Industrial Processes;Secondary Metal Production;Steel Foundries;Pouring/Casting | 2.05 |
| 39999989 | Industrial Processes;Miscellaneous Manufacturing Industries;Miscellaneous Industrial Processes;Other Not Classified | 1.68 |
| 39999994 | Industrial Processes;Miscellaneous Manufacturing Industries;Miscellaneous Industrial Processes;Other Not Classified | 1.48 |
| 30400799 | Industrial Processes;Secondary Metal Production;Steel Foundries;Other Not Classified | 1.47 |
| 30901201 | Industrial Processes;Fabricated Metal Products;Precious Metals Recovery;Reclamation Furnace | 1.28 |
| 31499999 | Industrial Processes;Transportation Equipment;Other Not Classified;Other Not Classified | 1.04 |
| 30988801 | Industrial Processes;Fabricated Metal Products;Fugitive Emissions;Specify in Comments Field | 1.03 |
| 30400350 | Industrial Processes;Secondary Metal Production;Grey Iron Foundries;Sand Grinding/Handling | 1.01 |
| 30400318 | Industrial Processes;Secondary Metal Production;Grey Iron Foundries;Pouring, Cooling | 0.98 |
| 30400310 | Industrial Processes;Secondary Metal Production;Grey Iron Foundries;Inoculation | 0.96 |
| 30400315 | Industrial Processes;Secondary Metal Production;Grey Iron Foundries;Charge Handling | 0.95 |

91125 – Lignite Combustion – Composite

The lignite combustion profile was created from profiles based on measurements from coal fired boilers equipped with a mixture of baghouse and dry/wet limestone scrubbers taken in 2002. Since 2002, several regulations have been passed that have created the need to improve the control technology for the combustion of coal (e.g. the Mercury and Air Toxics Standards). Due to updates in control technology across the EGU fleet since 2002, the typical speciation of emissions is likely to have changed as well. Therefore, this profile was assigned one point per region for source representativeness. This profile accounts for more than 1% of emissions in 2 regions and points were assigned in both regions based on the percent of emitted mass as described in Table 1.

91145 – Petroleum Industry – Avg – Composite

The petroleum industry composite profile is also an extremely general profile created in 1989 by averaging the original emission source profiles representing the source category group 306xxxxx and then removing the trace elemental values due to the questionable values according to Reff et al. (2009). Because the industrial manufacturing emission source category has changed since 1989, a point was assigned for source representativeness. In addition, mismatched SCCs account for over 10% of the overall profile emission mass so 2 points were assigned for “inventory source matches test source”. Table S12 shows the SCCs that account for the top ~80 % of the profile emission mass. One point was assigned per region for a discrepancy in the data because the trace elemental values were removed and flagged and the Quality rating in SPECIATE for this profile is an ‘E’. This profile accounts for more than 1% of emissions in 1 region and points were assigned in this region based on the percent of emitted mass as described in Table 1.

**Table S12.** Prominent SCCs applied to the Petroleum Manufacturing - Avg – Composite emission source profile for PM2.5 in the 2014 EPA emissions modeling platform. SCCs account for ~ 80% of the total emission mass of the profile.

|  |  |  |
| --- | --- | --- |
| **SCC** | **SCC Description** | **% of Profile Mass** |
| 2310000220 | Industrial Processes;Oil and Gas Exploration and Production;All Processes;Drill Rigs | 17.49 |
| 2310021400 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production;Gas Well Dehydrators | 12.44 |
| 2310021100 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production;Gas Well Heaters | 10.18 |
| 2310021302 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production;Natural Gas Fired 4Cycle Rich Burn Compressor Engines 50 To 499 HP | 8.91 |
| 30600701 | Industrial Processes;Petroleum Industry;Cooling Towers;Cooling Towers | 8.75 |
| 2310000660 | Industrial Processes;Oil and Gas Exploration and Production;All Processes;Hydraulic Fracturing Engines | 7.94 |
| 2310000330 | Industrial Processes;Oil and Gas Exploration and Production;All Processes;Artificial Lift | 5.44 |
| 2310010100 | Industrial Processes;Oil and Gas Exploration and Production;Crude Petroleum;Oil Well Heaters | 4.97 |
| 2310021351 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production;Lateral Compressors 4 Cycle Rich Burn | 3.17 |

*S3.2 VOC Emission Source Profiles*

Tables S13 and S14 show the points applied to each region for each profile, as well as the regional total score for each profile for VOC emissions based on mass and reactivity. As aforementioned, the prominent regions for a profile may differ for the mass weighted analysis (Table S13) when compared to the reactivity weighted analysis (Table S14), as the profiles that accounted for the top 2% of the total VOC emission mass for each region varied for each analysis. In addition to this, it is important to note that because the profiles analyzed here account for the top 2% of the total VOC mass in each region, it does not necessarily mean that a particular profile, and thus the SCCs associated with the source profile, are mapped to a particular region.

**Table S13.** Individual regional rankings for VOCemission source profiles based on mass. The following abbreviations were used to represent US regions: NE = Northeast, SE = Southeast, OV = Ohio Valley, UM = Upper Midwest, S = South, NRP = Northern Rockies and Plains, SW = Southwest, W = West, NW = Northwest

| **Profile** | **Representativeness of source** | **Level of Documentation** | **Inventory source matches tested source** | **Percent of VOC reactivity** | **Discrepancy/**  **error in data** | **Study region applicable?** | **Regional Total** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **0000**  **Overall Average** | | | |  |  |  |  |
| UM | 2 | 2 | 2 | 0 | 1 | 1 | 8 |
| **0121**  **Open Burning Dump - Landscape/Pruning** | | | |  |  |  |  |
| NE | 0 | 2 | 2 | 0 | 0 | 0 | 4 |
| SE | 0 | 2 | 2 | 0 | 0 | 0 | 4 |
| W | 0 | 2 | 2 | 0 | 0 | 0 | 4 |
| **1007**  **Internal Combustion Engine - Natural Gas** | | | |  |  |  |  |
| NRP | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| UM | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| W | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| **1011**  **Oil and Gas Production - Fugitives - Valves and Fittings - Liquid Service** | | | |  |  |  |  |
| NRP | 0 | 1 | 2 | 3 | 0 | 0 | 7 |
| S | 0 | 1 | 2 | 1 | 0 | 0 | 5 |
| **1188**  **Fermentation Processes** | | | |  |  |  |  |
| OV | 0 | 0 | 2 | 0 | 0 | 0 | 2 |
| **1191**  **Graphic Arts - (Printing)** | | | |  |  |  |  |
| NE | 1 | 1 | 0 | 1 | 0 | 0 | 3 |
| OV | 1 | 1 | 0 | 1 | 0 | 0 | 3 |
| SE | 1 | 1 | 0 | 0 | 0 | 0 | 2 |
| UM | 1 | 1 | 0 | 0 | 0 | 0 | 2 |
| W | 1 | 1 | 0 | 0 | 0 | 0 | 2 |
| **2487**  **Composite of 7 Emission Profiles from Crude Oil Storage Tanks - 1993** | | | |  |  |  |  |
| NRP | 0 | 1 | 2 | 3 | 0 | 0 | 6 |
| S | 0 | 1 | 2 | 3 | 0 | 0 | 6 |
| SW | 0 | 1 | 2 | 2 | 0 | 0 | 5 |
| W | 0 | 1 | 2 | 1 | 0 | 0 | 4 |
| **3001**  **Pesticides** | | | | |  |  |  |
| NW | 1 | 2 | 0 | 0 | 0 | 1 | 4 |
| OV | 1 | 2 | 0 | 0 | 0 | 1 | 4 |
| SE | 1 | 2 | 0 | 0 | 0 | 1 | 4 |
| UM | 1 | 2 | 0 | 0 | 0 | 1 | 4 |
| W | 1 | 2 | 0 | 0 | 0 | 0 | 3 |
| **3144**  **Consumer Products Composite: Solvents And Coating Related Products** | | | | |  |  |  |
| NE | 1 | 1 | 0 | 1 | 0 | 1 | 4 |
| W | 1 | 1 | 0 | 0 | 0 | 0 | 2 |
| **3145**  **Consumer Products Composite: Pesticides/FIFRA-Regulated Products** | | | | |  |  |  |
| NE | 1 | 1 | 0 | 0 | 0 | 1 | 3 |
| OV | 1 | 1 | 0 | 0 | 0 | 1 | 3 |
| SE | 1 | 1 | 0 | 0 | 0 | 1 | 3 |
| UM | 1 | 1 | 0 | 0 | 0 | 1 | 3 |
| **3146**  **Consumer Products Composite: Household Products** | | | |  |  |  |  |
| NE | 1 | 1 | 0 | 0 | 0 | 1 | 3 |
| OV | 1 | 1 | 0 | 0 | 0 | 1 | 3 |
| SE | 1 | 1 | 0 | 0 | 0 | 1 | 3 |
| SW | 1 | 1 | 0 | 0 | 0 | 1 | 3 |
| UM | 1 | 1 | 0 | 1 | 0 | 1 | 4 |
| **3147**  **Consumer Products Composite: Personal Care Products** | | | |  |  |  |  |
| NE | 1 | 1 | 0 | 0 | 0 | 1 | 3 |
| OV | 1 | 1 | 0 | 0 | 0 | 1 | 3 |
| SE | 1 | 1 | 0 | 0 | 0 | 1 | 3 |
| UM | 1 | 1 | 0 | 0 | 0 | 1 | 3 |
| **4642**  **Fireplace wood combustion - pine wood** | | | |  |  |  |  |
| NE | 1 | 0 | 2 | 2 | 1 | 0 | 6 |
| NW | 1 | 0 | 2 | 0 | 1 | 0 | 4 |
| OV | 1 | 0 | 2 | 1 | 1 | 0 | 5 |
| UM | 1 | 0 | 2 | 3 | 1 | 0 | 7 |
| **8520**  **Consumer and Commercial Products: Automotive Aftermarket Products: All Automotive Aftermarket Products** | | | | | | | |
| OV | 1 | 1 | 0 | 0 | 0 | 0 | 2 |
| SE | 1 | 1 | 0 | 0 | 0 | 0 | 2 |
| UM | 1 | 1 | 0 | 0 | 0 | 0 | 2 |
| **8744**  **Composite Profile - Architectural Coatings: Solvent Borne and water borne** | | | | | | | |
| NE | 1 | 1 | 0 | 1 | 0 | 1 | 4 |
| OV | 1 | 1 | 0 | 0 | 0 | 1 | 3 |
| SE | 1 | 1 | 0 | 1 | 0 | 1 | 4 |
| SW | 1 | 1 | 0 | 0 | 0 | 1 | 3 |
| UM | 1 | 1 | 0 | 1 | 0 | 1 | 4 |
| W | 1 | 1 | 0 | 0 | 0 | 0 | 2 |
| **8745**  **Composite Profile - Degreasing: Cold Cleaning (Batch, Conveyor, Spray Gun)** | | | | | | | |
| NE | 1 | 1 | 0 | 0 | 1 | 1 | 4 |
| OV | 1 | 1 | 0 | 0 | 1 | 1 | 4 |
| SE | 1 | 1 | 0 | 0 | 1 | 1 | 4 |
| **8869**  **Gasoline Headspace Vapor - 0% Ethanol (E0) Combined - EPAct/V2/E-89 Program** | | | | | |  |  |
| NE | 0 | 1 | 1 | 1 | 0 | 0 | 3 |
| OV | 0 | 1 | 1 | 0 | 0 | 0 | 2 |
| S | 0 | 1 | 1 | 0 | 0 | 0 | 2 |
| SE | 0 | 1 | 1 | 0 | 0 | 0 | 2 |
| UM | 0 | 1 | 1 | 0 | 0 | 0 | 2 |
| **8870**  **Gasoline Headspace Vapor - 10% Ethanol (E10) Combined - EPAct/V2/E-89 Program** | | | | | |  |  |
| NE | 0 | 1 | 1 | 1 | 0 | 0 | 3 |
| OV | 0 | 1 | 1 | 0 | 0 | 0 | 2 |
| SE | 0 | 1 | 1 | 0 | 0 | 0 | 2 |
| SW | 0 | 1 | 1 | 0 | 0 | 0 | 2 |
| UM | 0 | 1 | 1 | 1 | 0 | 0 | 3 |
| **8949**  **Natural Gas Production** | | | |  |  |  |  |
| NE | 0 | 1 | 0 | 2 | 0 | 0 | 3 |
| NRP | 0 | 1 | 0 | 1 | 0 | 0 | 2 |
| OV | 0 | 1 | 0 | 2 | 0 | 0 | 3 |
| S | 0 | 1 | 0 | 2 | 0 | 0 | 3 |
| UM | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| **95087a**  **Oil and Gas - Composite - Oil Field - Oil Tank Battery Vent Gas** | | | | | |  |  |
| S | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| **95109a**  **Oil and Gas - Composite - Oil Field - Condensate Tank Battery Vent Gas** | | | | |  |  |  |
| S | 0 | 1 | 0 | 1 | 0 | 0 | 2 |
| **95240**  **Beef Cattle Farm and Animal Waste** | | | | | | | |
| W | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| **95398**  **Composite Profile - Oil and Natural Gas Production - Condensate Tanks** | | | | | | | |
| SW | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| **95417**  **Oil and Gas Production - Composite Profile - Untreated Natural Gas, Uinta Basin** | | | | | | | |
| SW | 0 | 1 | 0 | 1 | 0 | 0 | 2 |
| **95419**  **Oil and Gas Production - Composite Profile - Oil Tank Vent Gas, Uinta Basin** | | | |  |  |  |  |
| SW | 0 | 1 | 0 | 1 | 0 | 0 | 2 |
| **95420**  **Oil and Gas Production - Composite Profile - Glycol Dehydrator, Uinta Basin** | | | | |  |  |  |
| SW | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| **95421**  **Composite Profile - Prescribed fire southeast conifer forest** | | | |  |  |  |  |
| OV | 0 | 0 | 2 | 1 | 0 | 0 | 3 |
| S | 0 | 0 | 2 | 2 | 0 | 0 | 4 |
| SE | 0 | 0 | 2 | 3 | 0 | 0 | 5 |
| UM | 0 | 0 | 2 | 2 | 0 | 0 | 4 |
| **95422**  **Composite Profile - Prescribed fire southwest conifer forest** | | | |  |  |  |  |
| OV | 0 | 0 | 2 | 3 | 0 | 0 | 5 |
| S | 0 | 0 | 2 | 2 | 0 | 0 | 4 |
| SW | 0 | 0 | 2 | 2 | 0 | 0 | 4 |
| UM | 0 | 0 | 2 | 1 | 0 | 0 | 3 |
| W | 0 | 0 | 2 | 3 | 0 | 0 | 5 |
| **95423**  **Composite Profile - Prescribed fire northwest conifer forest** | | | |  |  |  |  |
| NRP | 0 | 0 | 2 | 3 | 0 | 0 | 5 |
| NW | 0 | 0 | 2 | 3 | 0 | 0 | 5 |
| SW | 0 | 0 | 2 | 0 | 0 | 0 | 2 |
| **95424**  **Composite Profile - Wildfire northwest conifer forest** | | | | |  |  |  |
| NRP | 0 | 0 | 2 | 0 | 0 | 0 | 2 |
| NW | 0 | 0 | 2 | 3 | 0 | 0 | 5 |
| **95425**  **Composite Profile - Wildfire boreal forest** | | | | |  |  |  |
| OV | 0 | 0 | 2 | 1 | 0 | 1 | 4 |
| S | 0 | 0 | 2 | 0 | 0 | 1 | 3 |
| SE | 0 | 0 | 2 | 1 | 0 | 1 | 4 |
| **DJVNT\_R**  **Oil and Gas -Denver-Julesburg Basin Produced Gas Composition from Non-CBM Gas Wells** | | | | | |  |  |
| SW | 0 | 1 | 0 | 1 | 0 | 0 | 2 |
| **FLR99**  **Natural Gas Flare Profile with DRE >98%** | | | |  |  |  |  |
| NRP | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| **PRM01\_R**  **Oil and Gas -Permian Basin Produced Gas Composition for Non-CBM Wells** | | | | |  |  |  |
| S | 0 | 1 | 1 | 0 | 0 | 0 | 2 |
| SW | 0 | 1 | 1 | 0 | 0 | 0 | 2 |
| **SSJCO\_R**  **Oil and Gas -South San Juan Basin Produced Gas Composition from Non-CBM Gas Wells** | | | | | |  |  |
| SW | 0 | 1 | 0 | 1 | 0 | 0 | 2 |
| **SWVNT\_R**  **Oil and Gas -SW Wyoming Basin Produced Gas Composition from Non-CBM Wells** | | | | | |  |  |
| NRP | 0 | 1 | 0 | 1 | 0 | 0 | 2 |

**Table S14.** Individual regional rankings for VOC emission source profiles based on reactivity. The following abbreviations were used to represent US regions: NE = Northeast, SE = Southeast, OV = Ohio Valley, UM = Upper Midwest, S = South, NRP = Northern Rockies and Plains, SW = Southwest, W = West, NW = Northwest.

| **Profile** | **Representativeness of source** | | **Level of Documentation** | **Inventory source matches tested source** | **Percent of VOC reactivity** | | **Discrepancy/ error in data** | | | **Study region applicable?** | | | **Regional Total** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **0000**  **Overall Average** | | | |  |  | |  | | |  | | |  | |
| OV | 2 | 2 | | 2 | 0 | | 1 | | | 1 | | | 8 | |
| UM | 2 | 2 | | 2 | 0 | | 1 | | | 1 | | | 8 | |
| **0121**  **Open Burning Dump - Landscape/Pruning** | | | | |  | |  | | |  | | |  | |
| OV | 0 | 2 | | 2 | 1 | | 0 | | | 0 | | | 5 | |
| UM | 0 | 2 | | 2 | 1 | | 0 | | | 0 | | | 5 | |
| NE | 0 | 2 | | 2 | 2 | | 0 | | | 0 | | | 6 | |
| SE | 0 | 2 | | 2 | 1 | | 0 | | | 0 | | | 5 | |
| W | 0 | 2 | | 2 | 0 | | 0 | | | 0 | | | 4 | |
| **1001**  **Internal Combustion Engine - Natural Gas** | | | | |  | |  | | |  | | |  | |
| S | 0 | 1 | | 1 | 0 | | 0 | | | 0 | | | 2 | |
| SW | 0 | 1 | | 1 | 1 | | 0 | | | 0 | | | 3 | |
| **1011**  **Oil and Gas Production - Fugitives - Valves and Fittings - Liquid Service**  4 | | | | | | | | | |  | | |  | |
| S | 0 | 0 | | 2 | 1 | | 0 | | | 0 | | | 3 | |
| NRP | 0 | 0 | | 2 | 2 | | 0 | | | 0 | | | 4 | |
| **1191**  **Graphic Arts - (Printing)** | | | | | |  | |  | | |
| OV | 1 | 1 | | 0 | 1 | | 0 | | | 0 | | | 3 | |
| NE | 1 | 1 | | 0 | 0 | | 0 | | | 0 | | | 2 | |
| **2487**  **Composite of 7 Emission Profiles from Crude Oil Storage Tanks – 1993** | | | | | | | | |  | | |  | |
| S | 0 | 1 | | 2 | 2 | | 0 | | | 0 | | | 5 | |
| SW | 0 | 1 | | 2 | 2 | | 0 | | | 0 | | | 5 | |
| W | 0 | 1 | | 2 | 1 | | 0 | | | 0 | | | 4 | |
| NRP | 0 | 1 | | 2 | 3 | | 0 | | | 0 | | | 6 | |
| **3142**  **Consumer Products Composite: Adhesives And Sealants** | | | | | | | | |  | | |  | |
| NE | 1 | 1 | | 0 | 0 | | 0 | | | 1 | | | 3 | |
| **3144**  **Consumer Products Composite: Solvents And Coating Related Products** | | | | | | | | |  | | |  | |
| NE | 1 | 1 | | 0 | 1 | | 0 | | | 1 | | | 4 | |
| **3145**  **Consumer Products Composite: Pesticides/FIFRA-Regulated Products**  4 | | | | | | | | | | | | | | |
| OV | 1 | 1 | | 0 | 0 | | 0 | | | 1 | | | 3 | |
| UM | 1 | 1 | | 0 | 0 | | 0 | | | 1 | | | 3 | |
| NE | 1 | 1 | | 0 | 0 | | 0 | | | 1 | | | 3 | |
| SE | 1 | 1 | | 0 | 0 | | 0 | | | 1 | | | 3 | |
| **3146**  **Consumer Products Composite: Household Products** | | | | |  | |  | | |  | | |  | |
| OV | 1 | 1 | | 0 | 0 | | 0 | | | 1 | | | 3 | |
| UM | 1 | 1 | | 0 | 0 | | 0 | | | 1 | | | 3 | |
| NE | 1 | 1 | | 0 | 0 | | 0 | | | 1 | | | 3 | |
| SE | 1 | 1 | | 0 | 0 | | 0 | | | 1 | | | 3 | |
| **3147**  **Consumer Products Composite: Personal Care Products** | | | | |  | |  | | |  | | |  | |
| OV | 1 | 1 | | 0 | 0 | | 0 | | | 1 | | | 3 | |
| UM | 1 | 1 | | 0 | 0 | | 0 | | | 1 | | | 3 | |
| NE | 1 | 1 | | 0 | 0 | | 0 | | | 1 | | | 3 | |
| SE | 1 | 1 | | 0 | 0 | | 0 | | | 1 | | | 3 | |
| **4553**  **Meat charbroiling** | | | | |  | |  | | |  | | |  | |
| NE | 0 | 0 | | 0 | 0 | | 1 | | | 0 | | | 1 | |
| **4642**  **Fireplace wood combustion - pine wood** | | | | |  | |  | | |  | | |  | |
| OV | 1 | 0 | | 2 | 2 | | 1 | | | 0 | | | 6 | |
| UM | 1 | 0 | | 2 | 3 | | 1 | | | 0 | | | 7 | |
| NE | 1 | 0 | | 2 | 3 | | 1 | | | 0 | | | 7 | |
| NW | 1 | 0 | | 2 | 1 | | 1 | | | 0 | | | 5 | |
| SE | 1 | 0 | | 2 | 0 | | 1 | | | 0 | | | 4 | |
| SW | 1 | 0 | | 2 | 0 | | 1 | | | 0 | | | 4 | |
| **8744**  **Composite Profile - Architectural Coatings: Solvent Borne and water borne** | | | | | | | | | | | | | | |
| OV | 1 | 1 | | 0 | 0 | | 0 | | | 1 | | | 3 | |
| UM | 1 | 1 | | 0 | 1 | | 0 | | | 1 | | | 4 | |
| NE | 1 | 1 | | 0 | 1 | | 0 | | | 1 | | | 4 | |
| SE | 1 | 1 | | 0 | 0 | | 0 | | | 1 | | | 3 | |
| **8745**  **Composite Profile - Degreasing: Cold Cleaning (Batch, Conveyor, Spray Gun)** | | | | | | | | | | | |  | |  | |
| OV | 1 | 1 | | 0 | 0 | | 1 | | | 1 | | | 4 | |
| NE | 1 | 1 | | 0 | 0 | | 1 | | | 1 | | | 4 | |
| **8746**  **Composite Profile - Straw Burning** | | | | | | | | |  | | |  | |
| SE | 0 | 0 | | 2 | 0 | | 0 | | | 0 | | | 2 | |
|  |  |  | |  |  | |  | | |  | | |  | |
| **8869**  **Gasoline Headspace Vapor - 0% Ethanol (E0) Combined - EPAct/V2/E-89 Program** | | | | | | | | |  | | |  | |
| OV | 0 | 1 | | 1 | 0 | | 0 | | | 0 | | | 2 | |
| UM | 0 | 1 | | 1 | 1 | | 0 | | | 0 | | | 3 | |
| NE | 0 | 1 | | 1 | 1 | | 0 | | | 0 | | | 3 | |
| SE | 0 | 1 | | 1 | 1 | | 0 | | | 0 | | | 3 | |
| S | 0 | 1 | | 1 | 1 | | 0 | | | 0 | | | 3 | |
| NRP | 0 | 1 | | 1 | 0 | | 0 | | | 0 | | | 2 | |
| **8870**  **Gasoline Headspace Vapor - 10% Ethanol (E10) Combined - EPAct/V2/E-89 Program** | | | | | | | | |  | | |  | |
| OV | 0 | 1 | | 1 | 1 | | 0 | | | 0 | | | 3 | |
| UM | 0 | 1 | | 1 | 1 | | 0 | | | 0 | | | 3 | |
| NE | 0 | 1 | | 1 | 1 | | 0 | | | 0 | | | 3 | |
| SE | 0 | 1 | | 1 | 1 | | 0 | | | 0 | | | 3 | |
| S | 0 | 1 | | 1 | 0 | | 0 | | | 0 | | | 2 | |
| SW | 0 | 1 | | 1 | 1 | | 0 | | | 0 | | | 3 | |
| **8949**  **Natural Gas Production** | | | | |  | |  | | |  | | |  | |
| OV | 0 | 1 | | 0 | 1 | | 0 | | | 0 | | | 2 | |
| NE | 0 | 1 | | 0 | 1 | | 0 | | | 0 | | | 2 | |
| S | 0 | 1 | | 0 | 2 | | 0 | | | 0 | | | 3 | |
| NRP | 0 | 1 | | 0 | 1 | | 0 | | | 0 | | | 2 | |
| **95398**  **Composite Profile - Oil and Natural Gas Production - Condensate Tanks** | | | | | | | | |  | | |  | |
| SW | 0 | 0 | | 0 | 1 | | 0 | | | 0 | | | 1 | |
| **95417**  **Oil and Gas Production - Composite Profile - Untreated Natural Gas, Uinta Basin** | | | | | | | | |  | | |  | |
| SW | 0 | 1 | | 0 | 1 | | 0 | | | 0 | | | 2 | |
| **95419**  **Oil and Gas Production - Composite Profile - Oil Tank Vent Gas, Uinta Basin** | | | | | | | | |  | | |  | |
| SW | 0 | 1 | | 0 | 1 | | 0 | | | 0 | | | 2 | |
| **95420**  **Oil and Gas Production - Composite Profile - Glycol Dehydrator, Uinta Basin** | | | | | | | | | | | | | | |
| SW | 0 | 1 | | 0 | 1 | | 0 | | | 0 | | | 2 | |
| **95421**  **Composite Profile - Prescribed fire southeast conifer forest** | | | | |  | |  | | |  | | |  | |
| OV | 0 | 0 | | 2 | 1 | | 0 | | | 0 | | | 3 | |
| UM | 0 | 0 | | 2 | 2 | | 0 | | | 0 | | | 4 | |
| NE | 0 | 0 | | 2 | 1 | | 0 | | | 0 | | | 3 | |
| SE | 0 | 0 | | 2 | 3 | | 0 | | | 0 | | | 5 | |
| S | 0 | 0 | | 2 | 3 | | 0 | | | 0 | | | 5 | |
| **95422**  **Composite Profile - Prescribed fire southwest conifer forest** | | | | |  | |  | | |  | | |  | |
| OV | 0 | 0 | | 2 | 3 | | 0 | | | 0 | | | 5 | |
| UM | 0 | 0 | | 2 | 1 | | 0 | | | 0 | | | 3 | |
| S | 0 | 0 | | 2 | 2 | | 0 | | | 0 | | | 4 | |
| SW | 0 | 0 | | 2 | 3 | | 0 | | | 0 | | | 5 | |
| W | 0 | 0 | | 2 | 3 | | 0 | | | 0 | | | 5 | |
| **95423**  **Composite Profile - Prescribed fire northwest conifer forest** | | | | | | | | |  | | |  | |
| NW | 0 | 0 | | 2 | 3 | | 0 | | | 0 | | | 5 | |
| SW | 0 | 0 | | 2 | 1 | | 0 | | | 0 | | | 3 | |
| NRP | 0 | 0 | | 2 | 3 | | 0 | | | 0 | | | 5 | |
| **95424**  **Composite Profile - Wildfire northwest conifer forest** | | | | | | | | |  | | |  | |
| NW | 0 | 0 | | 2 | 3 | | 0 | | | 0 | | | 5 | |
| NRP | 0 | 0 | | 2 | 1 | | 0 | | | 0 | | | 3 | |
| **95425**  **Composite Profile - Wildfire boreal forest** | | | | | | | | |  | | |  | |
| OV | 0 | 0 | | 2 | 2 | | 0 | | | 1 | | | 5 | |
| NE | 0 | 0 | | 2 | 0 | | 0 | | | 1 | | | 3 | |
| SE | 0 | 0 | | 2 | 1 | | 0 | | | 1 | | | 4 | |
| S | 0 | 0 | | 2 | 1 | | 0 | | | 1 | | | 4 | |
| **95109a**  **Oil and Gas - Composite - Oil Field - Condensate Tank Battery Vent Gas** | | | | | | | | | | | | | | |
| S | 0 | 1 | | 0 | 0 | | 0 | | | 0 | | | 1 | |
| **DJVNT\_R**  **Oil and Gas -Denver-Julesburg Basin Produced Gas Composition from Non-CBM Gas Wells** | | | | | | | | | | | | | |
| SW | 0 | 1 | | 0 | 1 | | 0 | | | 0 | | | 2 | |
| **FLR99**  **Natural Gas Flare Profile with DRE >98%** | | | | | | | | |  | | |  | |
| NRP | 0 | 0 | | 0 | 2 | | 0 | | | 0 | | | 2 | |
| **PRM01\_R**  **Oil and Gas -Permian Basin Produced Gas Composition for Non-CBM Wells** | | | | | | | | |  | | |  | |
| S | 0 | 1 | | 1 | 0 | | 0 | | | 0 | | | 2 | |
| SW | 0 | 1 | | 1 | 0 | | 0 | | | 0 | | | 2 | |
| **SSJCO\_R**  **Oil and Gas -South San Juan Basin Produced Gas Composition from Non-CBM Gas Wells** | | | | | | | | | | | | | |
| SW | 0 | 1 | | 0 | 1 | | 0 | | | 0 | | | 2 | |
| **SWVNT\_R**  **Oil and Gas -SW Wyoming Basin Produced Gas Composition from Non-CBM Wells** | | | | | | | | |  | | |  | |
| NRP | 0 | 1 | | 0 | 1 | | 0 | | | 0 | | | 0 | |

0000 – Overall Average

Also known as the ‘King of all Profiles,’ the overall average profile is an average of all the emission source categories for which there is no emission profile. Because of this, the overall average is assigned two points for source representativeness, two points for the reliability of reference, two points for the inventory source not matching the SCCs for which it is applied, one point for a discrepancy in data (the profile has a J rating of 1 and a Quality score of ‘E’ in SPECIATE and is also assigned one point for regional applicability for both regions in which it is prominent (Upper Midwest, West). Table S15 shows the SCCs that account for the top 80% of the profile emission mass. This profile accounts for more than 2% of emissions and reactivity in 2 regions and points were assigned in both regions based on the percent of emitted mass and percent of reactivity as described in Table 1.

**Table S15.** Prominent SCCs applied to the Overall Average emission source profile for VOC in the 2014 EPA emissions modeling platform. SCCs account for ~ 80% of the total emission mass of the profile.

|  |  |  |
| --- | --- | --- |
| **SCC** | **SCC Description** | **% of Profile Mass** |
| 30299998 | Industrial Processes;Food and Agriculture;Other Not Specified;Other Not Classified | 6.45 |
| 2401010000 | Solvent Utilization;Surface Coating;Textile Products: SIC 22;Total: All Solvent Types | 4.91 |
| 2680001000 | Waste Disposal, Treatment, and Recovery;Composting;100% Biosolids (e.g., sewage sludge, manure, mixtures of these matls);All Processes | 4.55 |
| 30201916 | Industrial Processes;Food and Agriculture;Vegetable Oil Processing;Oil Extraction | 3.51 |
| 30201998 | Industrial Processes;Food and Agriculture;Vegetable Oil Processing;Soybean Oil Production: Complete Process-Solvent Loss (average) | 2.94 |
| 30500623 | Industrial Processes;Mineral Products;Cement Manufacturing (Dry Process);Preheater/Precalciner Kiln | 2.75 |
| 30203201 | Industrial Processes;Food and Agriculture;Bakeries;Bread Baking: Sponge-Dough Process | 2.49 |
| 38500101 | Industrial Processes;Cooling Tower;Process Cooling;Mechanical Draft | 2.41 |
| 30203202 | Industrial Processes;Food and Agriculture;Bakeries;Bread Baking: Straight-Dough Process | 1.97 |
| 30288801 | Industrial Processes;Food and Agriculture;Fugitive Emissions;Specify in Comments Field | 1.72 |
| 30203299 | Industrial Processes;Food and Agriculture;Bakeries;Other Not Classified | 1.52 |
| 30200756 | Industrial Processes;Food and Agriculture;Grain Millings;Wet Corn Milling: Milling | 1.40 |
| 30201997 | Industrial Processes;Food and Agriculture;Vegetable Oil Processing;Soybean Oil Production: Complete Process-Solvent Loss(Plant-specific) | 1.22 |
| 30201999 | Industrial Processes;Food and Agriculture;Vegetable Oil Processing;Other Not Classified | 1.18 |
| 50400201 | Waste Disposal;Site Remediation;General Processes;Miscellaneous | 1.08 |
| 39000699 | Industrial Processes;In-process Fuel Use;Natural Gas;General | 1.04 |
| 2640000000 | Waste Disposal, Treatment, and Recovery;TSDFs;All TSDF Types;Total: All Processes | 0.95 |
| 50300899 | Waste Disposal;Solid Waste Disposal - Industrial;Treatment, Storage, Disposal/TSDF;General: Fugitive Emissions | 0.94 |
| 30399999 | Industrial Processes;Primary Metal Production;Other Not Classified;Other Not Classified | 0.91 |
| 30201608 | Industrial Processes;Food and Agriculture;Sugar Beet Processing;Pulp Dryer : Natural Gas-fired | 0.91 |
| 30203399 | Industrial Processes;Food and Agriculture;Tobacco Processing;Other Not Classified | 0.88 |
| 2399000000 | Industrial Processes;Industrial Processes: NEC;Industrial Processes: NEC;Total | 0.88 |
| 40714697 | Chemical Evaporation;Organic Chemical Storage;Fixed Roof Tanks - Miscellaneous;Other: Breathing Loss | 0.88 |
| 40714698 | Chemical Evaporation;Organic Chemical Storage;Fixed Roof Tanks - Miscellaneous;Other: Working Loss | 0.87 |
| 30300999 | Industrial Processes;Primary Metal Production;Steel Manufacturing (See 3-03-015 for Integrated Iron & Steel MACT);Other Not Classified | 0.80 |
| 62540023 | MACT Source Categories;Food and Agricultural Processes;Cellulose Food Casing Manufacture;Viscose Processing: Regeneration | 0.79 |
| 30800703 | Industrial Processes;Rubber and Miscellaneous Plastics Products;Fiberglass Resin Products;Solvent Consumption | 0.78 |
| 30200754 | Industrial Processes;Food and Agriculture;Grain Millings;Wet Corn Milling: Dryers | 0.78 |
| 2810030000 | Miscellaneous Area Sources;Other Combustion;Structure Fires;Unspecified | 0.77 |
| 30102110 | Industrial Processes;Chemical Manufacturing;Sodium Carbonate;Trona Calcining \*\* | 0.76 |
| 31499999 | Industrial Processes;Transportation Equipment;Other Not Classified;Other Not Classified | 0.71 |
| 30200787 | Industrial Processes;Food and Agriculture;Grain Millings;Soybean: Bean Conditioning | 0.65 |
| 30200899 | Industrial Processes;Food and Agriculture;Feed Manufacture;Not Classified \*\* | 0.65 |
| 40202402 | Chemical Evaporation;Surface Coating Operations;Large Aircraft;Cleaning/Pretreatment | 0.58 |
| 30300825 | Industrial Processes;Primary Metal Production;Iron Production (See 3-03-015 for Integrated Iron & Steel MACT);Cast House | 0.55 |
| 30200789 | Industrial Processes;Food and Agriculture;Grain Millings;Soybean: Meal Dryer | 0.53 |
| 30501204 | Industrial Processes;Mineral Products;Fiberglass Manufacturing;Forming: Rotary Spun (Wool-type Fiber) | 0.51 |
| 64470010 | MACT Source Categories;Cellulose-based Resins;Cellophane Manufacturing;Production of Viscose Solution | 0.51 |
| 2305000000 | Industrial Processes;Mineral Processes: SIC 32;All Processes;Total | 0.51 |
| 30501402 | Industrial Processes;Mineral Products;Glass Manufacture;Container Glass: Melting Furnace | 0.50 |
| 30282501 | Industrial Processes;Food and Agriculture;Wastewater, Points of Generation;Mineral Oil Stripper | 0.50 |
| 30200799 | Industrial Processes;Food and Agriculture;Grain Millings;See Comments \*\* | 0.50 |
| 30501205 | Industrial Processes;Mineral Products;Fiberglass Manufacturing;Curing Oven: Rotary Spun (Wool-type Fiber) | 0.46 |
| 30800112 | Industrial Processes;Rubber and Miscellaneous Plastics Products;Tire Manufacture;Milling | 0.45 |
| 30501299 | Industrial Processes;Mineral Products;Fiberglass Manufacturing;Other Not Classified | 0.45 |
| 30504010 | Industrial Processes;Mineral Products;Mining and Quarrying of Nonmetallic Minerals;Underground Ventilation | 0.45 |
| 30500706 | Industrial Processes;Mineral Products;Cement Manufacturing (Wet Process);Kilns | 0.45 |
| 30201931 | Industrial Processes;Food and Agriculture;Vegetable Oil Processing;Meal Preparation: Dryer | 0.45 |
| 30400318 | Industrial Processes;Secondary Metal Production;Grey Iron Foundries;Pouring, Cooling | 0.44 |
| 30500205 | Industrial Processes;Mineral Products;Asphalt Concrete;Drum Dryer: Drum Mix Plant (see 3-05-002-55 thru -63 for subtypes) | 0.43 |
| 31480001 | Industrial Processes;Transportation Equipment;Equipment Leaks;Equipment Leaks | 0.42 |
| 30501001 | Industrial Processes;Mineral Products;Coal Mining, Cleaning, and Material Handling;Fluidized Bed Reactor | 0.42 |
| 30599999 | Industrial Processes;Mineral Products;Other Not Defined;Specify in Comments Field | 0.42 |
| 30405001 | Industrial Processes;Secondary Metal Production;Miscellaneous Casting Fabricating;Other Not Classified | 0.41 |
| 30800704 | Industrial Processes;Rubber and Miscellaneous Plastics Products;Fiberglass Resin Products;Adhesive Consumption | 0.41 |
| 30201902 | Industrial Processes;Food and Agriculture;Vegetable Oil Processing;Cottonseed Oil: General | 0.41 |
| 30300106 | Industrial Processes;Primary Metal Production;Alumina Electrolytic Reduction;Degassing | 0.40 |
| 30500405 | Industrial Processes;Mineral Products;Calcium Carbide;Primary/Secondary Crushing | 0.40 |
| 30200767 | Industrial Processes;Food and Agriculture;Grain Millings;Fiber Drying: Drying Corn Hulls after Separation from Starch & Gluten | 0.39 |
| 31401512 | Industrial Processes;Transportation Equipment;Boat Manufacturing;Open Contact Molding: Spray Gel Coat Application | 0.38 |
| 31401517 | Industrial Processes;Transportation Equipment;Boat Manufacturing;Open Contact Molding: Resin Spray Layup | 0.38 |
| 30203801 | Industrial Processes;Food and Agriculture;Animal/Poultry Rendering;General | 0.37 |
| 30501520 | Industrial Processes;Mineral Products;Gypsum Manufacture;Drying Kiln | 0.34 |
| 30201899 | Industrial Processes;Food and Agriculture;Candy Manufacturing;Other Not Classified | 0.34 |
| 31401510 | Industrial Processes;Transportation Equipment;Boat Manufacturing;Molding and Lamination Operations | 0.33 |
| 30500622 | Industrial Processes;Mineral Products;Cement Manufacturing (Dry Process);Preheater Kiln | 0.33 |
| 30201919 | Industrial Processes;Food and Agriculture;Vegetable Oil Processing;Fugitive Leaks | 0.33 |
| 30502910 | Industrial Processes;Mineral Products;Lightweight Aggregate Manufacture;Rotary Kiln | 0.32 |
| 30200784 | Industrial Processes;Food and Agriculture;Grain Millings;Soybean: Drying | 0.31 |
| 30800111 | Industrial Processes;Rubber and Miscellaneous Plastics Products;Tire Manufacture;Compounding | 0.31 |
| 30300931 | Industrial Processes;Primary Metal Production;Steel Manufacturing (See 3-03-015 for Integrated Iron & Steel MACT);Hot Rolling | 0.31 |
| 30501215 | Industrial Processes;Mineral Products;Fiberglass Manufacturing;Curing Oven (Textile-type Fiber) | 0.31 |
| 33000499 | Industrial Processes;Textile Products;Fabric Finishing;Other Not Classified | 0.31 |
| 30201917 | Industrial Processes;Food and Agriculture;Vegetable Oil Processing;Meal Preparation | 0.31 |
| 30200951 | Industrial Processes;Food and Agriculture;Beer Production;Can Filling Line | 0.30 |
| 41000202 | Chemical Evaporation;Dry Cleaning;Petroleum Solvent - Commercial;Stoddard | 0.30 |
| 30200801 | Industrial Processes;Food and Agriculture;Feed Manufacture;General \*\* | 0.30 |
| 30201601 | Industrial Processes;Food and Agriculture;Sugar Beet Processing;Pulp Dryer : Coal-fired | 0.29 |
| 50300602 | Waste Disposal;Solid Waste Disposal - Industrial;Landfill Dump;Liquid Waste Disposal | 0.28 |
| 30501099 | Industrial Processes;Mineral Products;Coal Mining, Cleaning, and Material Handling;Other Not Classified | 0.27 |
| 30501214 | Industrial Processes;Mineral Products;Fiberglass Manufacturing;Forming Process (Textile-type Fiber) | 0.27 |
| 30200911 | Industrial Processes;Food and Agriculture;Beer Production;Fugitive Emissions: General | 0.27 |
| 31400903 | Industrial Processes;Transportation Equipment;Automobiles/Truck Assembly Operations;Stamping | 0.27 |
| 30500699 | Industrial Processes;Mineral Products;Cement Manufacturing (Dry Process);Other Not Classified | 0.26 |
| 30400299 | Industrial Processes;Secondary Metal Production;Copper;Other Not Classified | 0.26 |
| 33000106 | Industrial Processes;Textile Products;Miscellaneous;Drying | 0.24 |
| 30588801 | Industrial Processes;Mineral Products;Fugitive Emissions;Specify in Comments Field | 0.24 |
| 40202502 | Chemical Evaporation;Surface Coating Operations;Miscellaneous Metal Parts;Cleaning/Pretreatment | 0.23 |
| 30200904 | Industrial Processes;Food and Agriculture;Beer Production;Aging Tank: Secondary Fermentation | 0.23 |
| 30499999 | Industrial Processes;Secondary Metal Production;Other Not Classified;Specify in Comments Field | 0.23 |
| 30201401 | Industrial Processes;Food and Agriculture;Starch Manufacturing;Combined Operations | 0.23 |
| 30201906 | Industrial Processes;Food and Agriculture;Vegetable Oil Processing;Corn Oil: General | 0.23 |
| 30200953 | Industrial Processes;Food and Agriculture;Beer Production;Bottle Filling Line | 0.22 |
| 30201421 | Industrial Processes;Food and Agriculture;Starch Manufacturing;Fugitive Emissions: General | 0.22 |
| 30700630 | Industrial Processes;Pulp and Paper and Wood Products;Particleboard Manufacture;Direct Natural Gas-fired Rotary Dryer, Softwood | 0.22 |
| 30203803 | Industrial Processes;Food and Agriculture;Animal/Poultry Rendering;Cooking | 0.22 |
| 30501403 | Industrial Processes;Mineral Products;Glass Manufacture;Flat Glass: Melting Furnace | 0.21 |
| 30500850 | Industrial Processes;Mineral Products;Ceramic Clay/Tile Manufacture;Firing - Natural Gas-fired Kiln | 0.21 |
| 30200806 | Industrial Processes;Food and Agriculture;Feed Manufacture;Pellet Coolers | 0.21 |
| 30200821 | Industrial Processes;Food and Agriculture;Feed Manufacture;Fugitive Emissions: General | 0.21 |
| 68480001 | MACT Source Categories;Miscellaneous Processes (Chemicals);Equipment Leaks;Equipment Leaks | 0.21 |
| 64880001 | MACT Source Categories;Miscellaneous Polymers;Equipment Leaks;Equipment Leaks | 0.21 |
| 30200903 | Industrial Processes;Food and Agriculture;Beer Production;Brew Kettle \*\* (use SCC 3-02-009-07) | 0.20 |

0121 - Open Burning Dump - Landscape/Pruning

The profile for open burning dump specific to landscape pruning was created in the 1970s and is based on engineering judgement. Due to lack of documentation, this profile received two points per region. The SCCs applied to this profile range from open burning of vegetation and yard debris to the open burning of residential household waste and general refuse. Because mismatched SCCs account for greater than 10% of the profile mass, this profile received two points per region for “inventory source matches tested source”. This profile accounts for more than 2% of emissions and reactivity in 4 and 5 regions respectively. Points were assigned in these regions based on the percent of emitted mass and percent of reactivity as described in Table 1.

1001 – Internal Combustion Engine – Natural Gas

The internal combustion engine (natural gas specific) emission source profile was created prior to 1985 based on samples taken from two reciprocating engines operating under normal conditions. Another point was added per region for the level of documentation, as the data for this profile came from a report and was not peer-reviewed. The SCCs applied to this profile include a variety of internal combustion engines for natural gas and liquified petroleum gas, compressor engines used in onshore gas production, as well as an SCC for a surface coating oven heater for liquified petroleum gas. Because over 10% of the profile mass is applied to SCCs which matches the inventory source, 1 point was assigned per region. This profile accounts for more than 2% of reactivity in 2 regions. Points were assigned in these regions based on the percent of reactivity as described in Table 1.

1007 - Mineral Products - Asphaltic Concrete

This emission source profile was created in 1985 based on two samples taken of slow-cure asphalt that was prepared and distilled to generate organic samples that could be representative of emissions during application. Because this profile is based on a report that does not include peer-reviewed data, this profile was assigned one point per region for the level of documentation. This profile accounts for more than 2% of emissions in 2 regions. Points were assigned in these regions based on the percent of emitted mass as described in Table 1.

1011 - Oil and Gas Production - Fugitives - Valves and Fittings - Liquid Service

This emission source profile was developed in 1979 based on liquid service species data developed for the American Petroleum Institute. Because the data for this profile came from a report, this profile received one point per region for the level of documentation. The SCCs applied to this profile cover many aspects of crude oil production, liquid waste treatment and oil and gas exploration and production. Because mismatched SCCs account for greater than 10% of the overall profile mass, two points were assigned per region to this profile. This profile accounts for more than 2% of emissions and reactivity in 2 regions. Points were assigned in these regions based on the percent of emitted mass as described in Table 1.

1188 - Fermentation Processes

The fermentation processes emission source profile was created based on emissions data from four fermentation units in a whiskey distillery taken in 1974. While the testing done for this profile was whiskey specific, the SCCs that are currently being applied to the profile are not. Because greater than ten percent of the profile weight was assigned to SCCs that are not whiskey specific, two points was assigned to the profile. This profile accounts for more than 2% of reactivity in 1 region. Points were assigned in this region based on the percent of reactivity as described in Table 1.

1191 - Graphic Arts - Printing

The emission source profile for printing of graphic arts is based on a site visit and a survey sent out by mail in 1978 that included participation from the following types of companies: flexographic, lithographic, gravure, letterpress, printing inks. Due to changes in printing technology and regulations on VOC emissions from the graphic arts industry (e.g. 40 CFR Part 60 Subpart QQ) in the last 40 years, one point was assigned per region for source representativeness. In addition to this, because the data was obtained from a report that did not go through the peer review process, one point was assigned per region for the level of documentation. Finally, this profile accounts for more than 2% of emissions and reactivity in 2 and 6 regions respectively. Points were assigned in these regions based on the percent of emitted mass and percent of reactivity as described in Table 1.

2487 - Composite of 7 Emission Profiles from Crude Oil Storage Tanks – 1993

This profile is based on measurements taken in Oklahoma in 1989. The reference for this profile is a report that has not been through the peer review process, so another point was assigned per region for the level of documentation. Because greater than ten percent of the profile accounts for SCCs that do not match the data created by the emission source profile, two points were assigned to each region. This profile accounts for more than 2% of emissions in 4 regions. Points were assigned in these regions based on the percent of emitted mass as described in Table 1.

3001 – Pesticides

The pesticides VOC emission source profile is based on the 2000 California statewide consumer product survey conducted by CARB. In this survey, CARB aggregates product composition data by product category. While aggregated survey data is publicly available there is no accompanying documentation. Consequently, the profile was assigned 2 points for the level of documentation. This profile was assigned an additional point per region for source representativeness since there have been changes in the composition of pesticides since 2000. Finally, these data are based formulations sold in California. The state of California has state regulations on the VOC content for some products. While some states have adopted California standards, it is not known how representative these California-specific product formulations are for other parts of the country. Therefore, one point was assigned per region (except for the West) for region applicability. This profile accounts for more than 2% of emissions in 4 regions. Points were assigned in these regions based on the percent of emitted mass as described in Table 1.

3142-3147 – Consumer Products

The consumer product profiles (profile #3142 (Consumer Products Composite: Adhesives and Sealants), #3144 (Consumer Products Composite: Solvents And Coating Related Products), #3145 (Consumer Products Composite: Pesticides/FIFRA-Regulated Products), 3146 (Consumer Products Composite: Household Products) and #3147 (Consumer Products Composite: Personal Care Products)) are based on a 1997 consumer products survey conducted by CARB. Because the composition of consumer products has changed since 1997, one point per region was applied to each of the consumer product composite profiles. In addition, because the data for this was documented in a report that did not undergo the peer review process, one point per region was assigned to the profile. The state of California has state regulations on the VOC content for some products. While some states have adopted California standards, it is not known how representative these California-specific product formulations are for other parts of the country. Therefore, one point was assigned per region (except for the West) for region applicability. These profiles accounts for more than 2% of emissions and reactivity in 1-6 regions. Points were assigned in these regions based on the percent of emitted mass and percent of reactivity as described in Table 1.

4553 - Meat charbroiling

The meat charbroiling emission source profile for VOC is based on measurements taken at a large institutional-scale natural gas fired char-broiler using commercially distributed preformed hamburger patties. The Quality rating in SECIATE for this profile is an ‘E,’ and therefore, the profile was assigned a point for discrepancy. This profile accounts for more than 2% of reactivity in 1 region. Points were assigned in this region based on percent of reactivity as described in Table 1.

4642 - Fireplace wood combustion - pine wood

The fireplace wood combustion profile that is specific to pine wood was created based on measurements taken from a residential fireplace located in southern Los Angeles, California, in 1998. Because fireplaces have changed since 1998, but there are still numerous pre-1998 fireplaces in use, one point was assigned per profile for source representativeness. While the profile is specific to pine wood, the SCCs applied to the profile are not. In addition to this, the SCCs applied to the profile also include other combustion units, such as woodstoves. Because greater than 10% of the total profile emission mass is assigned to SCCs that don’t necessarily match the profile, two points were assigned per region. In addition, because the Quality rating for this profile was an ‘E’ one point was also assigned per region for a discrepancy in data. This profile accounts for more than 2% of emissions and reactivity in 7 and 6 regions respectively. Points were assigned in these regions based on the percent of emitted mass and percent of reactivity as described in Table 1.

8520 - Consumer and Commercial Products: Automotive Aftermarket Products: All Automotive Aftermarket Products

The consumer and commercial products emission source profile for automotive aftermarket products was developed based on a survey conducted in the early 1990s. Because this product formulations have likely changed since then, one point was assigned to the profile for source representativeness. The data for this profile was obtained from a report that did not go through the peer review process and, therefore, one point was assigned per region for the level of documentation. This profile accounts for more than 2% of emissions in 3 regions. Points were assigned in these regions based on the percent of emitted as described in Table 1.

8744 - Composite Profile - Architectural Coatings: Solvent Borne and Water Borne

This composite profile was created from architectural coatings profiles for solvent borne coatings and water borne coatings that were based on the 1997 CARB Aerosol Coating Survey. This profile received a point per region for source appropriateness because the composition of aerosol coatings has changed since 1997. In addition to this, another point was assigned to the profile per region because the data came from a report that has not gone through the peer review process. Because this profile is based on products from California, where there are stricter environmental regulations on VOC content of products, these data may not be representative of the rest of the US. Therefore, one point was assigned per region for regional applicability. This profile accounts for more than 2% of emissions and reactivity in 3 and 4 regions respectively. Points were assigned in these regions based on the percent of emitted mass and percent of reactivity as described in Table 1.

8745 - Composite Profile - Degreasing: Cold Cleaning - Batch, Conveyor, Spray Gun

This composite profile was created from a number of solvent cleaning and degreasing profiles that were based on survey data from the 1995 CARB Solvent Cleaning/Degreasing Source Category Emission Inventory. As the composition of degreasing solvents has likely changed since 1995, one point was assigned per region for source appropriateness. In addition to this, because the state of California has state regulations on the VOC content for some products. While some states have adopted California standards, it is not known how representative these California-specific product formulations are for other parts of the country. Therefore, one point was assigned per region for region applicability. Because this profile is based on a report as opposed to a peer reviewed journal article, one point per region was assigned. Finally, the median Quality rating for this profile in SPECIATE is an ‘E’, therefore, one point was assigned per region for discrepancy in the data. This profile accounts for more than 2% of emissions and reactivity in 1 and 2 regions respectively. Points were assigned in these regions based on the percent of emitted mass and percent of reactivity as described in Table 1.

8746 - Composite Profile - Straw Burning

This profile is based on measurements from the combustion of rice straw from California and the combustion of wheat straw from Washington. While this profile contains measurements from the combustion of wheat straw and rice straw, the SCCs applied to this profile also include the combustion of alfalfa, asparagus, red beans, corn, soybeans, cotton, grasses, fallow, hay, peas, sugar cane, apples, apricots, cherries, nectarines, olives, peaches, pears, prunes, and unspecified vine crops. Because greater than ten percent of the overall profile mass was assigned to the mismatched SCCs, two points were assigned per region to the profile. This profile accounts for more than 2% of reactivity in 1 region. Points were assigned in this region based on the percent of reactivity as described in Table 1.

8869/8870 - Gasoline Headspace Vapor

The profiles for gasoline headspace vapor include profile # 8869 (Gasoline Headspace Vapor - 0% Ethanol (E0) Combined - EPAct/V2/E-89 Program – 2010) and #8870 (Gasoline Headspace Vapor - 10% Ethanol (E10) Combined - EPAct/V2/E-89 Program) in SPECIATE, which were developed in 2010 based on fuel samples from the EPAct test program - Phase 3 EPAct/V2 E-89 Test Program. Because these profiles are based on reports that did not go through the peer review process, one point was assigned per region for level of documentation. In addition, there are a few SCCs applied to the profile that don’t match the inventory source, such as an SCC for thinning solvents used in surface coating operations, a number of profiles for petroleum liquids storage, tank cars and trucks with crude oil and jet fuel, marine vessels with kerosene and soil/groundwater remediation. Because these mismatched SCCs account for less than ten percent of the overall profile mass, only one point was assigned per region. These profiles account for more than 2% of emissions and reactivity in 3-4 regions respectively. Points were assigned in these regions based on the percent of emitted mass and percent of reactivity as described in Table 1.

8949 - Natural Gas Production

The emission source profile for natural gas production was created in 2011 and is based on gas composition data from numerous sources across the industry (e.g. CENRAP database, GTI database, Gulf-wide Emission Inventory Study, Union Gas, Marcellus, Wyoming DEQ). A point was added per region for the level of documentation as the data for this profile is a memo describing the datasets used in the creation of the profile. This profile accounts for more than 2% of emissions and reactivity in 7 and 4 regions respectively. Points were assigned in these regions based on the percent of emitted mass and percent of reactivity as described in Table 1.

95240 - Beef Cattle Farm and Animal Waste

This emission source profile was created based on direct measurements made from livestock (beef cattle, dairy cattle, swine) and poultry waste emissions. This profile accounts for more than 2% of emissions in 1 region. Points were assigned in this region based on the percent of emitted mass as described in Table 1.

95398 - Composite Profile - Oil and Natural Gas Production - Condensate Tanks

This profile was created based on samples from condensate tank thief hatch leaks and other emission points prior to the control device taken in 2011 in the Denver-Julesburg Basin in Colorado. This profile accounts for more than 2% of reactivity in 1 region. Points were assigned in this region based on the percent of reactivity as described in Table 1.

95417 - Oil and Gas Production - Composite Profile - Untreated Natural Gas, Uinta Basin

The composite emission source profile for untreated natural gas in the Uinta Basin was developed based on emissions from fugitive leaks, pneumatic controllers and pneumatic pumps at oil and gas production sites measured in 2013. One point was added for level of documentation as the data for this profile did not undergo the peer review process. This profile accounts for more than 2% of reactivity in 1 region. Points were assigned in this region based on the percent of reactivity as described in Table 1.

95419 - Oil and Gas Production - Composite Profile - Oil Tank Vent Gas, Uinta Basin

The composite profile for oil tank vent gas in the Uinta Basin was developed based on emissions of tank vapors from oil storage tanks at well pads taken in 2013. Similar to SPECIATE profile # 95417, this profile also received points for the level of documentation (non-peer reviewed data). This profile accounts for more than 2% of reactivity in 1 region. Points were assigned in this region based on the percent of reactivity as described in Table 1.

95420 - Oil and Gas Production - Composite Profile - Glycol Dehydrator, Uinta Basin

This profile was based on emissions of vapors from glycol dehydration still vents at oil and gas production sites in the Uinta Basin taken in 2013. Similar to profile 95417 in SPECIATE (Oil and Gas Production - Composite Profile - Untreated Natural Gas, Uinta Basin and profile 95419 in SPECIATE (Oil and Gas Production - Composite Profile - Oil Tank Vent Gas, Uinta Basin)), this profile was assigned a point for level of documentation. This profile accounts for more than 2% reactivity in 1 region. Points were assigned in this region based on the percent of reactivity as described in Table 1.

95421 - Composite Profile - Prescribed fire southeast conifer forest

The emission source profile for prescribed fire in the southeast conifer forest was created based on in-situ and field measurements of fuel from the southeastern US. The SCCs applied to this profile are specific to the smoldering and flaming phase of the fire, while the profile is not. Because flaming and smoldering emissions each account for more than 10% of the emissions assigned to this profile, two points were assigned per region the for the “inventory source matches tested source” category. This profile accounts for more than 2% of emissions and reactivity in 6 and 5 regions respectively. Points were assigned in these regions based on the percent of emitted mass and percent of reactivity as described in Table 1.

95422 - Composite Profile - Prescribed fire southwest conifer forest

The emission source profile for prescribed fire in the southwest conifer forest was created based on in-situ and field measurements of fuel from the Southwest, the Southeast and the West. Similar to profile #95421 in SPECIATE (Composite Profile - Prescribed fire southeast conifer forest), the SCCs applied to this profile are specific to the smoldering and flaming phase of the fire, while the profile is not. Because flaming and smoldering emissions each account for more than 10% of the emissions assigned to this profile, two points were assigned per region the for the inventory source matches tested source category. This profile accounts for more than 2% of emissions and reactivity in 7 and 5 regions respectively. Points were assigned in these regions based on the percent of emitted mass and percent of reactivity as described in Table 1.

95423 - Composite Profile - Prescribed fire northwest conifer forest

The emission source profile for prescribed fire in the northwest conifer forest was created based on in-situ and field measurements of fuel from the Northern Rockies and Plains, the West and the and the Northwest. Similar to profile #95421 (Composite Profile - Prescribed fire southeast conifer forest) and #95422 (Composite Profile - Prescribed fire southwest conifer forest) in SPECIATE, the SCCs applied to this profile are specific to the smoldering and flaming phase of the fire, while the profile is not. Because flaming and smoldering emissions each account for more than 10% of the emissions assigned to this profile, two points were assigned per region the for the inventory source matches tested source category. This profile accounts for more than 2% of emissions and reactivity in 2 and 3 regions respectively. Points were assigned in these regions based on the percent of emitted mass and percent of reactivity as described in Table 1.

95424 - Composite Profile - Wildfire northwest conifer forest

Similar to the other composite fire emission profiles in SPECIATE (profile #95422-94523), this profile was derived from in-situ and laboratory measurements of fuel from the West, the Northwest and the Northern Rockies and Plains. The SCCs applied to this profile are specific to the smoldering and flaming phase of the fire, while the profile is not. Because flaming and smoldering emissions each account for more than 10% of the emissions assigned to this profile, two points were assigned per region the for the inventory source matches tested source category. This profile accounts for more than 2% of emissions and reactivity in 1 and 2 regions respectively. Points were assigned in these regions based on the percent of emitted mass and percent of reactivity as described in Table 1.

95425 - Composite Profile - Wildfire boreal forest

The final fire composite emissions source profile is for wildfires in the boreal forest, where boreal forest is a biome characterized by coniferous forests. Similar to profile #95421-95424 in SPECIATE, this profile was also based on laboratory and in situ measurements of fuels from Canada and Alaska and does not account for flaming and smoldering, while the SCCs do. This profile is prominent in the Ohio Valley, the South, the Southeast and the Northeast for emitted mass and reactivity in addition to being prominent in the Southwest for emissions based on mass. Because the fuels used to create the profile did not come from these regions, one point per region was assigned for regional applicability. This profile accounts for more than 2% of emissions and reactivity in 5 and 4 regions respectively. Points were assigned in these regions based on the percent of emitted mass and percent of reactivity as described in Table 1.

95087a - Oil and Gas - Composite - Oil Field - Oil Tank Battery Vent Gas

The oil and gas composite profile for oil tank battery vent gas was created based on vent gas samples taken from oil storage tanks at well head and gathering site tank batteries in East Texas in 2006. Because this profile was derived from report data that did not go through the peer review process, one point was assigned per region for the level of documentation. This profile accounts for more than 2% of emissions in 1 region. Points were assigned in this region based on the percent of emitted mass as described in Table 1.

95109a - Oil and Gas - Composite - Oil Field - Condensate Tank Battery Vent Gas

The oil and gas composite profile for condensate tank battery vent gas was created based on vent gas samples taken from condensate storage tanks at well head and gathering site tank batteries in East Texas in 2006. Because this profile was derived from report data that did not go through the peer review process, one point was assigned for the level of documentation. This profile accounts for more than 2% of emissions and reactivity in 1 region. Points were assigned in this region based on the percent of emitted mass and percent of reactivity as described in Table 1.

DJVNT\_R - Oil and Gas -Denver-Julesburg Basin Produced Gas Composition from Non-CBM Gas Wells

The oil and gas emission source profile for the Denver-Julesburg Basin gas from non-CBM wells was based on GC/MS analysis of produced gas from non-CBM gas wells taken in 2006. Because this data was based on a report that did not go through the peer review process, one point was assigned for the level of documentation. This profile accounts for more than 2% of reactivity 1 region. Points were assigned in this based on the percent of reactivity as described in Table 1.

FLR99 - Natural Gas Flare Profile with DRE >98%

The natural gas flare with DRE > 98% emission source profile was created using data from flare study conducted in 2010 in Texas. The emission source profile was created based on hydrocarbon measurements for air assisted flare. A mixture of propylene and natural gas was used as vent gas for testing. This profile accounts for more than 2% of emissions and reactivity 1 region. Points were assigned in this region based on the percent of emitted mass and percent of reactivity as described in Table 1.

PRM01\_R - Oil and Gas -Permian Basin Produced Gas Composition for Non-CBM Wells

This profile was developed based on gas chromatography/mass spectrometry (GC/MS) analyses of gas samples taken from non-CBM wells in the Permian Basin in 2006. Because this profile is based on a report that did not go through the peer review process, one point per region was assigned to the profile. In addition, because some of the SCCs applied to the profile (cumulatively accounting for less than 10% of the total profile mass) were specific to CBM wells, while the profile is specific to non-CBM wells, another point per region was assigned to the profile. This profile accounts for more than 2% of emissions and reactivity in 1 and 2 regions respectively. Points were assigned in these regions based on the percent of emitted mass and percent of reactivity as described in Table 1.

SSJCO\_R - Oil and Gas -South San Juan Basin Produced Gas Composition from Non-CBM Gas Wells

This profile was developed based on gas chromatography/mass spectrometry (GC/MS) analyses of gas samples taken from non-CBM wells in the San Juan Basin in 2006. This profile is based on data that did not go through the peer review process, therefore it was assigned one point for level of documentation. This profile accounts for more than 2% of reactivity 1 region. Points were assigned in this region based on the percent of reactivity as described in Table 1.

SWVNT\_R - Oil and Gas -SW Wyoming Basin Produced Gas Composition from Non-CBM Wells

This profile was developed based on gas chromatography/mass spectrometry (GC/MS) analyses of gas samples taken from non-CBM wells in the SW Wyoming Basin in 2006. This profile is based on data that did not go through the peer review process, therefore it was assigned one point for level of documentation. This profile accounts for more than 2% of reactivity 1 region. Points were assigned in this region based on the percent of reactivity as described in Table 1.

**S4. Individual Profile Needs**

*S4.1 PM2.5 Emission Source Profile Needs*

91100 – Unpaved Road Dust – Composite

The primary concern with PM2.5 emission source profile #91100 in SPECIATE (Unpaved Road Dust) is specificity due to the profile only containing data that represents the West, Southwest, South and the Ohio Valley, yet being applied on a nearly national scale. Therefore, new data representing the Upper Midwest, Northeast, Northwest, Southeast and Northern Rockies and Plains would be beneficial to the profile.

91101 - Agricultural Soil - Composite

The concerns with the PM2.5 emission source profile for agricultural soil falls into the specificity category. Because soil varies regionally, samples from the Ohio Valley, the Upper Midwest, the Northeast, the Southeast and the Northern Rockies and Plains would create a profile with a better representation of soil at the national level. While there are a wide range of SCCs applied to the profile based on crop management technique and livestock type/management, 99% of the profile total emission mass is applied to the SCC for emissions from tilling. Therefore, measurements of dust created from agricultural tilling would be the most beneficial.

91102 – Wildfire- Composite

There are three major recommendations for the wildfire composite PM2.5 emission source profile. The first recommendation for this profile is to remove the fencepost measurements that were used in the creation of the profile. In addition, because wildfire fuel varies at the regional scale, measurements representing fuel from the Ohio Valley, the Upper Midwest, the Northeast, the Northwest, the Southwest and the West would be beneficial. Another potential update would include differentiating between the smoldering and flaming phases, as there are significant differences in emissions between the two stages of a fire.

91103 – Agricultural Burning – Composite

The agricultural burning emission source profile also falls under the specificity category. Because the SCCs applied to the profile are crop specific and emissions differ based on crop type and region, crop- or region-specific emission source profiles are recommended. The following regions are not represented in the data used to create the profile: the Ohio Valley, the Upper Midwest, the Northeast, Southeast, the South, the Southwest and the Northern Rockies and Plains. Table S16 shows the SCCs currently being applied to the emission source profile and thus the different crop types represented. In addition to this, there are several waste disposal/open burning SCCs currently being applied to this profile. Because this profile is not representative of emissions from waste burning, it is recommended that emissions tests be conducted to aid in creation of new profiles for open burning of household waste and open burning of yard waste (vegetation).

**Table S16.** SCCs currently being applied to profile #91103 in SPECIATE (Agricultural Burning – Composite).

|  |  |  |
| --- | --- | --- |
| **SCC** | **SCC Description** | **% of Profile Mass** |
| 2610000500 | Waste Disposal, Treatment, and Recovery;Open Burning;All Categories;Land Clearing Debris (use 28-10-005-000 for Logging Debris Burning) | 47.86 |
| 2610030000 | Waste Disposal, Treatment, and Recovery;Open Burning;Residential;Household Waste (use 26-10-000-xxx for Yard Wastes) | 29.03 |
| 2801500170 | Miscellaneous Area Sources;Agriculture Production - Crops - as nonpoint;Agricultural Field Burning - whole field set on fire;Field Crop is Grasses: Burning Techniques Not Important | 11.44 |
| 2801500000 | Miscellaneous Area Sources;Agriculture Production - Crops - as nonpoint;Agricultural Field Burning - whole field set on fire;Unspecified crop type and Burn Method | 4.20 |
| 2801500250 | Miscellaneous Area Sources;Agriculture Production - Crops - as nonpoint;Agricultural Field Burning - whole field set on fire;Field Crop is Sugar Cane: Burning Techniques Not Significant | 2.24 |
| 2801500141 | Miscellaneous Area Sources;Agriculture Production - Crops - as nonpoint;Agricultural Field Burning - whole field set on fire;Field Crop is Bean (red): Headfire Burning | 0.84 |
| 2801500261 | Miscellaneous Area Sources;Agriculture Production - Crops - as nonpoint;Agricultural Field Burning - whole field set on fire;Field Crop is Wheat: Headfire Burning | 0.73 |
| 2610000300 | Waste Disposal, Treatment, and Recovery;Open Burning;All Categories;Yard Waste - Weed Species Unspecified (incl Grass) | 0.67 |
| 2610000100 | Waste Disposal, Treatment, and Recovery;Open Burning;All Categories;Yard Waste - Leaf Species Unspecified | 0.60 |
| 2801500150 | Miscellaneous Area Sources;Agriculture Production - Crops - as nonpoint;Agricultural Field Burning - whole field set on fire;Field Crop is Corn: Burning Techniques Not Important | 0.58 |
| 2610000400 | Waste Disposal, Treatment, and Recovery;Open Burning;All Categories;Yard Waste - Brush Species Unspecified | 0.57 |
| 2801500262 | Miscellaneous Area Sources;Agriculture Production - Crops - as nonpoint;Agricultural Field Burning - whole field set on fire;Field Crop is Wheat: Backfire Burning | 0.42 |
| 2801500171 | Miscellaneous Area Sources;Agriculture Production - Crops - as nonpoint;Agricultural Field Burning - whole field set on fire;Fallow | 0.22 |
| 2801500264 | Miscellaneous Area Sources;Agriculture Production - Crops - as nonpoint;Agricultural Field Burning - whole field set on fire;DoubleCrop Winter Wheat and Soybeans | 0.13 |
| 50200207 | Waste Disposal;Solid Waste Disposal - Commercial/Institutional;Open Burning;Forest Residues | 0.12 |
| 2801500111 | Miscellaneous Area Sources;Agriculture Production - Crops - as nonpoint;Agricultural Field Burning - whole field set on fire;Field Crop is Alfalfa : Headfire Burning | 0.10 |
| 2801500160 | Miscellaneous Area Sources;Agriculture Production - Crops - as nonpoint;Agricultural Field Burning - whole field set on fire;Field Crop is Cotton: Burning Techniques Not Important | 0.09 |
| 2801500181 | Miscellaneous Area Sources;Agriculture Production - Crops - as nonpoint;Agricultural Field Burning - whole field set on fire;Field Crop is Hay (wild): Headfire Burning | 0.06 |
| 2801500300 | Miscellaneous Area Sources;Agriculture Production - Crops - as nonpoint;Agricultural Field Burning - whole field set on fire;Orchard Crop Unspecified | 0.03 |
| 2801500320 | Miscellaneous Area Sources;Agriculture Production - Crops - as nonpoint;Agricultural Field Burning - whole field set on fire;Orchard Crop is Apple | 0.02 |
| 2801500100 | Miscellaneous Area Sources;Agriculture Production - Crops - as nonpoint;Agricultural Field Burning - whole field set on fire;Field Crops Unspecified | 0.01 |
| 2801500500 | Miscellaneous Area Sources;Agriculture Production - Crops - as nonpoint;Agricultural Field Burning - whole field set on fire;Vine Crop Unspecified | 0.01 |
| 2801500201 | Miscellaneous Area Sources;Agriculture Production - Crops - as nonpoint;Agricultural Field Burning - whole field set on fire;Field Crop is Pea: Headfire Burning | 0.01 |
| 2801500350 | Miscellaneous Area Sources;Agriculture Production - Crops - as nonpoint;Agricultural Field Burning - whole field set on fire;Orchard Crop is Cherry | 0.01 |
| 2801500420 | Miscellaneous Area Sources;Agriculture Production - Crops - as nonpoint;Agricultural Field Burning - whole field set on fire;Orchard Crop is Pear | 0.00 |
| 2801500410 | Miscellaneous Area Sources;Agriculture Production - Crops - as nonpoint;Agricultural Field Burning - whole field set on fire;Orchard Crop is Peach | 0.00 |
| 50300201 | Waste Disposal;Solid Waste Disposal - Industrial;Open Burning;Wood/Vegetation/Leaves | 0.00 |
| 2801500151 | Miscellaneous Area Sources;Agriculture Production - Crops - as nonpoint;Agricultural Field Burning - whole field set on fire;Double Crop Winter Wheat and Corn | 0.00 |
| 2801500263 | Miscellaneous Area Sources;Agriculture Production - Crops - as nonpoint;Agricultural Field Burning - whole field set on fire;DoubleCrop Winter Wheat and Cotton | 0.00 |
| 2801500152 | Miscellaneous Area Sources;Agriculture Production - Crops - as nonpoint;Agricultural Field Burning - whole field set on fire;DoubleCrop Corn and Soybeans | 0.00 |
| 2801500430 | Miscellaneous Area Sources;Agriculture Production - Crops - as nonpoint;Agricultural Field Burning - whole field set on fire;Orchard Crop is Prune | 0.00 |
| 2801500330 | Miscellaneous Area Sources;Agriculture Production - Crops - as nonpoint;Agricultural Field Burning - whole field set on fire;Orchard Crop is Apricot | 0.00 |
| 2801500120 | Miscellaneous Area Sources;Agriculture Production - Crops - as nonpoint;Agricultural Field Burning - whole field set on fire;Field Crop is Asparagus: Burning Techniques Not Significant | 0.00 |
| 2801500390 | Miscellaneous Area Sources;Agriculture Production - Crops - as nonpoint;Agricultural Field Burning - whole field set on fire;Orchard Crop is Nectarine | 0.00 |
| 2801500220 | Miscellaneous Area Sources;Agriculture Production - Crops - as nonpoint;Agricultural Field Burning - whole field set on fire;Field Crop is Rice: Burning Techniques Not Significant | 0.00 |
| 2801500400 | Miscellaneous Area Sources;Agriculture Production - Crops - as nonpoint;Agricultural Field Burning - whole field set on fire;Orchard Crop is Olive | 0.00 |

91105 – Residential Wood Combustion – Composite

The composite profile for residential wood combustion both needs new data as well as needs to be updated based on specificity. Because this profile is based on measurements from outdated technology, new measurements are needed from a variety of different device types, including fireplaces, wood stoves, furnaces, hydronic heaters and a fire pit. For a more specific description, please refer to Table S17, which shows the SCCs currently being applied to this emission source profile.

**Table S17.** SCCs currently being applied to profile # 91105 in SPECIATE (Residential Wood Combustion – Composite).

|  |  |  |
| --- | --- | --- |
| **SCC** | **SCC Description** | **% of Profile Mass** |
| 2104008610 | Stationary Source Fuel Combustion;Residential;Wood;Hydronic heater: outdoor | 23.51 |
| 2104008310 | Stationary Source Fuel Combustion;Residential;Wood;Woodstove: freestanding, non-EPA certified | 20.56 |
| 2104008320 | Stationary Source Fuel Combustion;Residential;Wood;Woodstove: freestanding, EPA certified, non-catalytic | 14.13 |
| 2104008330 | Stationary Source Fuel Combustion;Residential;Wood;Woodstove: freestanding, EPA certified, catalytic | 9.73 |
| 2104008100 | Stationary Source Fuel Combustion;Residential;Wood;Fireplace: general | 9.20 |
| 2104008700 | Stationary Source Fuel Combustion;Residential;Wood;Outdoor wood burning device, NEC (fire-pits, chimeas, etc) | 6.18 |
| 2104008510 | Stationary Source Fuel Combustion;Residential;Wood;Furnace: Indoor, cordwood-fired, non-EPA certified | 6.11 |
| 2104008210 | Stationary Source Fuel Combustion;Residential;Wood;Woodstove: fireplace inserts; non-EPA certified | 4.62 |
| 2104009000 | Stationary Source Fuel Combustion;Residential;Firelog;Total: All Combustor Types | 2.38 |
| 2104008220 | Stationary Source Fuel Combustion;Residential;Wood;Woodstove: fireplace inserts; EPA certified; non-catalytic | 1.85 |
| 2104008230 | Stationary Source Fuel Combustion;Residential;Wood;Woodstove: fireplace inserts; EPA certified; catalytic | 0.91 |
| 2104008400 | Stationary Source Fuel Combustion;Residential;Wood;Woodstove: pellet-fired, general (freestanding or FP insert) | 0.81 |

91106 – HDDV Exhaust – Composite

The emission source profile for HDDV (Heavy Duty Diesel Vehicle) exhaust has an issue with specificity and is also in need of new data. Not only are the measurements used to create this profile old and a poor representation of the emission source category, there is also an extremely large range of SCCs being applied to this profile, with the top 80% listed in Table S3. The major emission source categories that need to be better represented include agricultural equipment, construction and mining equipment, locomotives, military aircrafts, stationary internal combustion engines, commercial marine vessels and rocket engines. For a complete list of SCCs applied to this profile, see Table S18.

**Table S18.** SCCs currently being applied to profile # 91106 in SPECIATE (HDDV Exhaust – Composite).

|  |  |  |
| --- | --- | --- |
| **SCC** | **SCC Description** | **% of Profile Mass** |
| 2270005015 | Mobile Sources;Off-highway Vehicle Diesel;Agricultural Equipment;Agricultural Tractors | 19.32 |
| 2285002006 | Mobile Sources;Railroad Equipment;Diesel;Line Haul Locomotives: Class I Operations | 15.81 |
| 2280002200 | Mobile Sources;Marine Vessels, Commercial;Diesel;Underway emissions | 11.03 |
| 2270002066 | Mobile Sources;Off-highway Vehicle Diesel;Construction and Mining Equipment;Tractors/Loaders/Backhoes | 5.09 |
| 2270002072 | Mobile Sources;Off-highway Vehicle Diesel;Construction and Mining Equipment;Skid Steer Loaders | 4.25 |
| 2270002060 | Mobile Sources;Off-highway Vehicle Diesel;Construction and Mining Equipment;Rubber Tire Loaders | 3.02 |
| 2270002069 | Mobile Sources;Off-highway Vehicle Diesel;Construction and Mining Equipment;Crawler Tractor/Dozers | 2.98 |
| 2270002036 | Mobile Sources;Off-highway Vehicle Diesel;Construction and Mining Equipment;Excavators | 2.68 |
| 2275001000 | Mobile Sources;Aircraft;Military Aircraft;Total | 1.92 |
| 2270005020 | Mobile Sources;Off-highway Vehicle Diesel;Agricultural Equipment;Combines | 1.90 |
| 2275050011 | Mobile Sources;Aircraft;General Aviation;Piston | 1.69 |
| 2270006005 | Mobile Sources;Off-highway Vehicle Diesel;Commercial Equipment;Generator Sets | 1.68 |
| 2270002051 | Mobile Sources;Off-highway Vehicle Diesel;Construction and Mining Equipment;Off-highway Trucks | 1.58 |
| 2270002057 | Mobile Sources;Off-highway Vehicle Diesel;Construction and Mining Equipment;Rough Terrain Forklifts | 1.36 |
| 2270003060 | Mobile Sources;Off-highway Vehicle Diesel;Industrial Equipment;AC\\Refrigeration | 1.34 |
| 2275020000 | Mobile Sources;Aircraft;Commercial Aircraft;Total: All Types | 1.28 |
| 28500201 | Internal Combustion Engines;Railroad Equipment;Diesel;Yard Locomotives | 1.21 |
| 2270006025 | Mobile Sources;Off-highway Vehicle Diesel;Commercial Equipment;Welders | 1.05 |
| 2270002015 | Mobile Sources;Off-highway Vehicle Diesel;Construction and Mining Equipment;Rollers | 1.02 |
| 2270003020 | Mobile Sources;Off-highway Vehicle Diesel;Industrial Equipment;Forklifts | 0.93 |
| 2275050012 | Mobile Sources;Aircraft;General Aviation;Turbine | 0.93 |
| 2270006015 | Mobile Sources;Off-highway Vehicle Diesel;Commercial Equipment;Air Compressors | 0.83 |
| 2275060012 | Mobile Sources;Aircraft;Air Taxi;Turbine | 0.78 |
| 2285002007 | Mobile Sources;Railroad Equipment;Diesel;Line Haul Locomotives: Class II / III Operations | 0.74 |
| 2270002048 | Mobile Sources;Off-highway Vehicle Diesel;Construction and Mining Equipment;Graders | 0.73 |
| 2270002018 | Mobile Sources;Off-highway Vehicle Diesel;Construction and Mining Equipment;Scrapers | 0.72 |
| 2280002100 | Mobile Sources;Marine Vessels, Commercial;Diesel;Port emissions | 0.69 |
| 2270008005 | Mobile Sources;Off-highway Vehicle Diesel;Airport Ground Support Equipment;Airport Ground Support Equipment | 0.65 |
| 20100101 | Internal Combustion Engines;Electric Generation;Distillate Oil (Diesel);Turbine | 0.63 |
| 2282020005 | Mobile Sources;Pleasure Craft;Diesel;Inboard/Sterndrive | 0.61 |
| 2270004066 | Mobile Sources;Off-highway Vehicle Diesel;Lawn and Garden Equipment;Chippers/Stump Grinders (Commercial) | 0.60 |
| 2270002030 | Mobile Sources;Off-highway Vehicle Diesel;Construction and Mining Equipment;Trenchers | 0.57 |
| 2270004046 | Mobile Sources;Off-highway Vehicle Diesel;Lawn and Garden Equipment;Front Mowers (Commercial) | 0.49 |
| 2270002045 | Mobile Sources;Off-highway Vehicle Diesel;Construction and Mining Equipment;Cranes | 0.48 |
| 2270003070 | Mobile Sources;Off-highway Vehicle Diesel;Industrial Equipment;Terminal Tractors | 0.48 |
| 2270005055 | Mobile Sources;Off-highway Vehicle Diesel;Agricultural Equipment;Other Agricultural Equipment | 0.47 |
| 2270006010 | Mobile Sources;Off-highway Vehicle Diesel;Commercial Equipment;Pumps | 0.44 |
| 2270003040 | Mobile Sources;Off-highway Vehicle Diesel;Industrial Equipment;Other General Industrial Equipment | 0.43 |
| 2270007015 | Mobile Sources;Off-highway Vehicle Diesel;Logging Equipment;Forest Eqp - Feller/Bunch/Skidder | 0.42 |
| 20200102 | Internal Combustion Engines;Industrial;Distillate Oil (Diesel);Reciprocating | 0.40 |
| 20100102 | Internal Combustion Engines;Electric Generation;Distillate Oil (Diesel);Reciprocating | 0.38 |
| 2270002033 | Mobile Sources;Off-highway Vehicle Diesel;Construction and Mining Equipment;Bore/Drill Rigs | 0.37 |
| 2270003030 | Mobile Sources;Off-highway Vehicle Diesel;Industrial Equipment;Sweepers/Scrubbers | 0.37 |
| 2270002081 | Mobile Sources;Off-highway Vehicle Diesel;Construction and Mining Equipment;Other Construction Equipment | 0.35 |
| 2270005035 | Mobile Sources;Off-highway Vehicle Diesel;Agricultural Equipment;Sprayers | 0.34 |
| 2270002003 | Mobile Sources;Off-highway Vehicle Diesel;Construction and Mining Equipment;Pavers | 0.33 |
| 2270005060 | Mobile Sources;Off-highway Vehicle Diesel;Agricultural Equipment;Irrigation Sets | 0.31 |
| 2270002075 | Mobile Sources;Off-highway Vehicle Diesel;Construction and Mining Equipment;Off-highway Tractors | 0.28 |
| 2275070000 | Mobile Sources;Aircraft;Aircraft Auxiliary Power Units;Total | 0.26 |
| 2270005045 | Mobile Sources;Off-highway Vehicle Diesel;Agricultural Equipment;Swathers | 0.24 |
| 2270003010 | Mobile Sources;Off-highway Vehicle Diesel;Industrial Equipment;Aerial Lifts | 0.23 |
| 2270009010 | Mobile Sources;Off-highway Vehicle Diesel;Underground Mining Equipment;Other Underground Mining Equipment | 0.21 |
| 2285002015 | Mobile Sources;Railroad Equipment;Diesel;Railway Maintenance | 0.20 |
| 2275060011 | Mobile Sources;Aircraft;Air Taxi;Piston | 0.18 |
| 20300101 | Internal Combustion Engines;Commercial/Institutional;Distillate Oil (Diesel);Reciprocating | 0.17 |
| 2270005030 | Mobile Sources;Off-highway Vehicle Diesel;Agricultural Equipment;Agricultural Mowers | 0.16 |
| 2270010010 | Mobile Sources;Off-highway Vehicle Diesel;Industrial Equipment;Other Oil Field Equipment | 0.15 |
| 2270002054 | Mobile Sources;Off-highway Vehicle Diesel;Construction and Mining Equipment;Crushing/Processing Equipment | 0.14 |
| 2270004056 | Mobile Sources;Off-highway Vehicle Diesel;Lawn and Garden Equipment;Lawn and Garden Tractors (Commercial) | 0.13 |
| 2270001060 | Mobile Sources;Off-highway Vehicle Diesel;Recreational Equipment;Specialty Vehicles/Carts | 0.12 |
| 2270005025 | Mobile Sources;Off-highway Vehicle Diesel;Agricultural Equipment;Balers | 0.12 |
| 2270002027 | Mobile Sources;Off-highway Vehicle Diesel;Construction and Mining Equipment;Signal Boards/Light Plants | 0.11 |
| 2285002009 | Mobile Sources;Railroad Equipment;Diesel;Line Haul Locomotives: Commuter Lines | 0.11 |
| 20100109 | Internal Combustion Engines;Electric Generation;Distillate Oil (Diesel);Turbine: Exhaust | 0.11 |
| 20400201 | Internal Combustion Engines;Engine Testing;Rocket Engine Testing;Rocket Motor: Solid Propellant | 0.09 |
| 20400402 | Internal Combustion Engines;Engine Testing;Reciprocating Engine;Diesel/Kerosene | 0.09 |
| 20200401 | Internal Combustion Engines;Industrial;Large Bore Engine;Diesel | 0.09 |
| 2285002008 | Mobile Sources;Railroad Equipment;Diesel;Line Haul Locomotives: Passenger Trains (Amtrak) | 0.07 |
| 2270002024 | Mobile Sources;Off-highway Vehicle Diesel;Construction and Mining Equipment;Surfacing Equipment | 0.07 |
| 2801520000 | Miscellaneous Area Sources;Agriculture Production - Crops;Orchard Heaters;Total, all fuels | 0.07 |
| 2270004071 | Mobile Sources;Off-highway Vehicle Diesel;Lawn and Garden Equipment;Turf Equipment (Commercial) | 0.07 |
| 2270002021 | Mobile Sources;Off-highway Vehicle Diesel;Construction and Mining Equipment;Paving Equipment | 0.07 |
| 20400302 | Internal Combustion Engines;Engine Testing;Turbine;Diesel/Kerosene | 0.06 |
| 2270003050 | Mobile Sources;Off-highway Vehicle Diesel;Industrial Equipment;Other Material Handling Equipment | 0.05 |
| 2270005040 | Mobile Sources;Off-highway Vehicle Diesel;Agricultural Equipment;Tillers : 6 HP | 0.05 |
| 2285002010 | Mobile Sources;Railroad Equipment;Diesel;Yard Locomotives | 0.05 |
| 2270006030 | Mobile Sources;Off-highway Vehicle Diesel;Commercial Equipment;Pressure Washers | 0.04 |
| 2104011000 | Stationary Source Fuel Combustion;Residential;Kerosene;Total: All Heater Types | 0.04 |
| 2270002039 | Mobile Sources;Off-highway Vehicle Diesel;Construction and Mining Equipment;Concrete/Industrial Saws | 0.04 |
| 2270006035 | Mobile Sources;Off-highway Vehicle Diesel;Commercial Equipment;Hydro-power Units | 0.03 |
| 20200101 | Internal Combustion Engines;Industrial;Distillate Oil (Diesel);Turbine | 0.03 |
| 20200103 | Internal Combustion Engines;Industrial;Distillate Oil (Diesel);Turbine: Cogeneration | 0.03 |
| 20100901 | Internal Combustion Engines;Electric Generation;Kerosene/Naphtha (Jet Fuel);Turbine | 0.03 |
| 28888801 | Internal Combustion Engines;Fugitive Emissions;Other Not Classified;Specify in Comments | 0.03 |
| 2270002078 | Mobile Sources;Off-highway Vehicle Diesel;Construction and Mining Equipment;Dumpers/Tenders | 0.02 |
| 20200107 | Internal Combustion Engines;Industrial;Distillate Oil (Diesel);Reciprocating: Exhaust | 0.02 |
| 2810040000 | Miscellaneous Area Sources;Other Combustion;Aircraft/Rocket Engine Firing and Testing;Total | 0.02 |
| 20400101 | Internal Combustion Engines;Engine Testing;Aircraft Engine Testing;Turbojet | 0.02 |
| 2270002042 | Mobile Sources;Off-highway Vehicle Diesel;Construction and Mining Equipment;Cement and Mortar Mixers | 0.02 |
| 20400110 | Internal Combustion Engines;Engine Testing;Aircraft Engine Testing;Jet A Fuel | 0.02 |
| 2270005010 | Mobile Sources;Off-highway Vehicle Diesel;Agricultural Equipment;2-Wheel Tractors | 0.02 |
| 20400199 | Internal Combustion Engines;Engine Testing;Aircraft Engine Testing;Other Not Classified | 0.02 |
| 2270002009 | Mobile Sources;Off-highway Vehicle Diesel;Construction and Mining Equipment;Plate Compactors | 0.01 |
| 20100107 | Internal Combustion Engines;Electric Generation;Distillate Oil (Diesel);Reciprocating: Exhaust | 0.01 |
| 20400112 | Internal Combustion Engines;Engine Testing;Aircraft Engine Testing;JP-4 Fuel | 0.01 |
| 20100909 | Internal Combustion Engines;Electric Generation;Kerosene/Naphtha (Jet Fuel);Turbine: Exhaust | 0.01 |
| 20400303 | Internal Combustion Engines;Engine Testing;Turbine;Distillate Oil | 0.01 |
| 2103011000 | Stationary Source Fuel Combustion;Commercial/Institutional;Kerosene;Total: All Combustor Types | 0.01 |
| 2282020010 | Mobile Sources;Pleasure Craft;Diesel;Outboard | 0.01 |
| 2270004036 | Mobile Sources;Off-highway Vehicle Diesel;Lawn and Garden Equipment;Snowblowers (Commercial) | 0.01 |
| 20400305 | Internal Combustion Engines;Engine Testing;Turbine;Kerosene/Naphtha | 0.01 |
| 20200901 | Internal Combustion Engines;Industrial;Kerosene/Naphtha (Jet Fuel);Turbine | 0.01 |
| 20400102 | Internal Combustion Engines;Engine Testing;Aircraft Engine Testing;Turboshaft | 0.01 |
| 27000320 | Internal Combustion Engines;Off-highway Diesel Engines;Industrial Equipment;Industrial Fork Lift: Diesel | 0.01 |
| 20200902 | Internal Combustion Engines;Industrial;Kerosene/Naphtha (Jet Fuel);Reciprocating | 0.01 |
| 20200104 | Internal Combustion Engines;Industrial;Distillate Oil (Diesel);Reciprocating: Cogeneration | < 0.01 |
| 2102011000 | Stationary Source Fuel Combustion;Industrial;Kerosene;Total: All Boiler Types | < 0.01 |
| 20400111 | Internal Combustion Engines;Engine Testing;Aircraft Engine Testing;JP-5 Fuel | < 0.01 |
| 20300102 | Internal Combustion Engines;Commercial/Institutional;Distillate Oil (Diesel);Turbine | < 0.01 |
| 2270004076 | Mobile Sources;Off-highway Vehicle Diesel;Lawn and Garden Equipment;Other Lawn and Garden Equipment (Commercial) | < 0.01 |
| 20300107 | Internal Combustion Engines;Commercial/Institutional;Distillate Oil (Diesel);Reciprocating: Exhaust | < 0.01 |
| 20200407 | Internal Combustion Engines;Industrial;Large Bore Engine;Exhaust | < 0.01 |
| 50100601 | Waste Disposal;Solid Waste Disposal - Government;Fire Fighting;Structure: Jet Fuel | < 0.01 |
| 20100902 | Internal Combustion Engines;Electric Generation;Kerosene/Naphtha (Jet Fuel);Reciprocating | < 0.01 |
| 2270002006 | Mobile Sources;Off-highway Vehicle Diesel;Construction and Mining Equipment;Tampers/Rammers | < 0.01 |
| 20200109 | Internal Combustion Engines;Industrial;Distillate Oil (Diesel);Turbine: Exhaust | < 0.01 |
| 20400403 | Internal Combustion Engines;Engine Testing;Reciprocating Engine;Distillate Oil | < 0.01 |
| 20400406 | Internal Combustion Engines;Engine Testing;Reciprocating Engine;Kerosene/Naphtha (Jet Fuel) | < 0.01 |
| 2270006020 | Mobile Sources;Off-highway Vehicle Diesel;Commercial Equipment;Gas Compressors | < 0.01 |
| 20100105 | Internal Combustion Engines;Electric Generation;Distillate Oil (Diesel);Reciprocating: Crankcase Blowby | < 0.01 |
| 20400202 | Internal Combustion Engines;Engine Testing;Rocket Engine Testing;Liquid Propellant | < 0.01 |
| 2270004031 | Mobile Sources;Off-highway Vehicle Diesel;Lawn and Garden Equipment;Leafblowers/Vacuums (Commercial) | < 0.01 |
| 20200105 | Internal Combustion Engines;Industrial;Distillate Oil (Diesel);Reciprocating: Crankcase Blowby | < 0.01 |
| 20400399 | Internal Combustion Engines;Engine Testing;Turbine;Other Not Classified | < 0.01 |
| 20200106 | Internal Combustion Engines;Industrial;Distillate Oil (Diesel);Reciprocating: Evaporative Losses (Fuel Storage and Delivery System) | < 0.01 |
| 20300106 | Internal Combustion Engines;Commercial/Institutional;Distillate Oil (Diesel);Reciprocating: Evaporative Losses (Fuel Storage and Delivery System) | < 0.01 |
| 20300109 | Internal Combustion Engines;Commercial/Institutional;Distillate Oil (Diesel);Turbine: Exhaust | < 0.01 |
| 20100106 | Internal Combustion Engines;Electric Generation;Distillate Oil (Diesel);Reciprocating: Evaporative Losses (Fuel Storage and Delivery System) | < 0.01 |
| 2270007010 | Mobile Sources;Off-highway Vehicle Diesel;Logging Equipment;Shredders : 6 HP | < 0.01 |
| 20300909 | Internal Combustion Engines;Commercial/Institutional;Kerosene/Naphtha (Jet Fuel);Turbine: Exhaust | < 0.01 |
| 20300901 | Internal Combustion Engines;Commercial/Institutional;Kerosene/Naphtha (Jet Fuel);Turbine: JP-4 | < 0.01 |
| 20200406 | Internal Combustion Engines;Industrial;Large Bore Engine;Evaporative Losses (Fuel Storage and Delivery System) | < 0.01 |
| 50100603 | Waste Disposal;Solid Waste Disposal - Government;Fire Fighting;Structure: Kerosene | < 0.01 |

91107 – Construction Dust – Composite

The primary need for the construction dust emission source profile is measurements made in the Ohio Valley region which is the only region for which this profile is applied to > 1% of emitted PM2.5 mass. In particular, emissions from general road construction (institutional, residential, construction) are needed.

91108 - Paved Road Dust – Composite

The primary concerns with the emission source profile for paved road dust falls under the specificity category, with new measurements from different geographic locations (Upper Midwest, Northeast, and Southeast) needed to create a better representation of the regional differences in paved dust emissions.

91109 – Prescribed Burning – Composite

Because fuel varies on a regional basis, measurements representing the Ohio Valley, the Upper Midwest, the Northeast, the Northwest, the Southwest and the West are recommended to help improve this emission source profile. In addition, another improvement would be the creation of separate profiles differentiating between the smoldering and flaming phase, as there are significant differences in emissions between the two stages of a fire.

91110 – Sub-Bituminous Combustion – Composite

The sub-bituminous coal combustion emission source profile needs both new data due to advancements in the control devices used since the creation of the profile as well as improvements with specificity. The SCCs applied to the profile specify equipment and coal type, as shown in Table S19. Therefore, measurements that fit the control categories listed are recommended. In addition to this, it is also recommended that the SCCs that refer to coal types other than sub-bituminous be mapped elsewhere. Otherwise, measurements based on these coal types are needed and the profile should be altered to a more generic coal combustion emission source profile.

**Table S19.** SCCs currently being applied to profile # 91110 in SPECIATE (Sub-Bituminous Combustion – Composite).

|  |  |  |
| --- | --- | --- |
| **SCC** | **SCC Description** | **% of Profile Mass** |
| 10100212 | External Combustion Boilers;Electric Generation;Bituminous Coal, Pulverized;Boiler, Dry Bottom Tangential-fired | 25.34 |
| 10100202 | External Combustion Boilers;Electric Generation;Bituminous Coal, Pulverized;Boiler, Dry Bottom | 23.59 |
| 10100222 | External Combustion Boilers;Electric Generation;Subbituminous Coal, Pulverized;Boiler, Dry Bottom | 12.37 |
| 2102002000 | Stationary Source Fuel Combustion;Industrial;Bituminous/Subbituminous Coal;Total: All Boiler Types | 12.32 |
| 10100226 | External Combustion Boilers;Electric Generation;Subbituminous Coal, Pulverized;Boiler, Dry Bottom Tangential-fired | 6.37 |
| 10100203 | External Combustion Boilers;Electric Generation;Bituminous Coal;Boiler, Cyclone Furnace | 3.41 |
| 10100215 | External Combustion Boilers;Electric Generation;Bituminous Coal;Cell Burner | 2.17 |
| 10100223 | External Combustion Boilers;Electric Generation;Subbituminous Coal;Cyclone Furnace | 1.85 |
| 10100201 | External Combustion Boilers;Electric Generation;Bituminous Coal, Pulverized;Boiler, Wet Bottom | 1.75 |
| 10200202 | External Combustion Boilers;Industrial;Bituminous Coal;Pulverized Coal: Dry Bottom | 1.27 |
| 10200204 | External Combustion Boilers;Industrial;Bituminous Coal;Spreader Stoker | 1.17 |
| 2103002000 | Stationary Source Fuel Combustion;Commercial/Institutional;Bituminous/Subbituminous Coal;Total: All Boiler Types | 0.67 |
| 10100101 | External Combustion Boilers;Electric Generation;Anthracite Coal, Pulverized;Boiler | 0.60 |
| 10200201 | External Combustion Boilers;Industrial;Bituminous Coal;Pulverized Coal: Wet Bottom | 0.50 |
| 10100221 | External Combustion Boilers;Electric Generation;Subbituminous Coal, Pulverized;Boiler, Wet Bottom | 0.47 |
| 30300306 | Industrial Processes;Primary Metal Production;By-product Coke Manufacturing;Oven Underfiring | 0.37 |
| 10100218 | External Combustion Boilers;Electric Generation;Bituminous Coal;Boiler, Atmospheric Fluidized Bed Combustion: Circulating Bed | 0.36 |
| 10100204 | External Combustion Boilers;Electric Generation;Bituminous Coal;Boiler, Spreader Stoker | 0.35 |
| 10200224 | External Combustion Boilers;Industrial;Subbituminous Coal;Spreader Stoker | 0.34 |
| 10100801 | External Combustion Boilers;Electric Generation;Petroleum Coke;All Boiler Sizes | 0.28 |
| 30300302 | Industrial Processes;Primary Metal Production;Metallurgical Coke Manufacturing;By-product Process: Oven Charging | 0.26 |
| 30300317 | Industrial Processes;Primary Metal Production;Metallurgical Coke Manufacturing;By-product Process: Combustion Stack: Coke Oven Gas (COG) | 0.24 |
| 10200203 | External Combustion Boilers;Industrial;Bituminous Coal;Cyclone Furnace | 0.24 |
| 10200222 | External Combustion Boilers;Industrial;Subbituminous Coal;Pulverized Coal: Dry Bottom | 0.22 |
| 10200225 | External Combustion Boilers;Industrial;Subbituminous Coal;Traveling Grate (Overfeed) Stoker | 0.21 |
| 30300303 | Industrial Processes;Primary Metal Production;Metallurgical Coke Manufacturing;By-product Process: Oven Pushing | 0.21 |
| 10200217 | External Combustion Boilers;Industrial;Bituminous Coal;Atmospheric Fluidized Bed Combustion: Bubbling Bed | 0.18 |
| 10100217 | External Combustion Boilers;Electric Generation;Bituminous Coal;Boiler, Atmospheric Fluidized Bed Combustion: Bubbling Bed | 0.17 |
| 30300304 | Industrial Processes;Primary Metal Production;Metallurgical Coke Manufacturing;By-product Process: Quenching | 0.17 |
| 10200802 | External Combustion Boilers;Industrial;Petroleum Coke;All Boiler Sizes | 0.15 |
| 10200205 | External Combustion Boilers;Industrial;Bituminous Coal;Overfeed Stoker | 0.15 |
| 10100238 | External Combustion Boilers;Electric Generation;Subbituminous Coal;Boiler, Atmospheric Fluidized Bed Combustion: Circulating Bed | 0.14 |
| 10300209 | External Combustion Boilers;Commercial/Institutional;Bituminous Coal;Spreader Stoker | 0.12 |
| 30300331 | Industrial Processes;Primary Metal Production;Metallurgical Coke Manufacturing;By-product Process: General | 0.12 |
| 10200226 | External Combustion Boilers;Industrial;Subbituminous Coal;Pulverized Coal: Dry Bottom Tangential | 0.12 |
| 10200221 | External Combustion Boilers;Industrial;Subbituminous Coal;Pulverized Coal: Wet Bottom | 0.11 |
| 30300313 | Industrial Processes;Primary Metal Production;Metallurgical Coke Manufacturing;Coal Preheater | 0.10 |
| 30302357 | Industrial Processes;Primary Metal Production;Taconite Iron Ore Processing;Induration: Grate/Kiln, Coke & Coal-fired, Acid Pellets | 0.09 |
| 10200804 | External Combustion Boilers;Industrial;Petroleum Coke;Cogeneration | 0.09 |
| 30300315 | Industrial Processes;Primary Metal Production;Metallurgical Coke Manufacturing;By-product Process: Gas By-product Plant | 0.08 |
| 10200219 | External Combustion Boilers;Industrial;Bituminous Coal;Cogeneration | 0.08 |
| 30302360 | Industrial Processes;Primary Metal Production;Taconite Iron Ore Processing;Induration: Grate/Kiln, Coal-fired, Flux Pellets | 0.07 |
| 10200218 | External Combustion Boilers;Industrial;Bituminous Coal;Atmospheric Fluidized Bed Combustion: Circulating Bed | 0.07 |
| 10100224 | External Combustion Boilers;Electric Generation;Subbituminous Coal;Boiler, Spreader Stoker | 0.07 |
| 39000289 | Industrial Processes;In-process Fuel Use;Bituminous Coal;General (Bituminous) | 0.06 |
| 10200212 | External Combustion Boilers;Industrial;Bituminous Coal;Pulverized Coal: Dry Bottom (Tangential) | 0.06 |
| 10300207 | External Combustion Boilers;Commercial/Institutional;Bituminous Coal;Overfeed Stoker | 0.06 |
| 39000899 | Industrial Processes;In-process Fuel Use;Coke;General: Coke | 0.05 |
| 30500313 | Industrial Processes;Mineral Products;Brick Manufacture;Curing and Firing: Coal-fired Tunnel Kilns | 0.05 |
| 10100205 | External Combustion Boilers;Electric Generation;Bituminous Coal;Boiler, Traveling Grate (Overfeed) Stoker | 0.05 |
| 30300312 | Industrial Processes;Primary Metal Production;Metallurgical Coke Manufacturing;Coke Crushing/Screening/Handling | 0.05 |
| 10200229 | External Combustion Boilers;Industrial;Subbituminous Coal;Cogeneration | 0.04 |
| 30300307 | Industrial Processes;Primary Metal Production;Metallurgical Coke Manufacturing;Coal Crushing/Handling | 0.04 |
| 30300314 | Industrial Processes;Primary Metal Production;Metallurgical Coke Manufacturing;By-product Process: Topside Leaks, Lid Leaks | 0.04 |
| 30300399 | Industrial Processes;Primary Metal Production;Metallurgical Coke Manufacturing;By-product Process: Not Classified | 0.04 |
| 39000201 | Industrial Processes;In-process Fuel Use;Bituminous Coal;Cement Kiln/Dryer (Bituminous Coal) | 0.03 |
| 10300218 | External Combustion Boilers;Commercial/Institutional;Bituminous Coal;Atmospheric Fluidized Bed Combustion: Circulating Bed | 0.03 |
| 10100237 | External Combustion Boilers;Electric Generation;Subbituminous Coal;Boiler, Atmospheric Fluidized Bed Combustion: Bubbling Bed | 0.03 |
| 10300102 | External Combustion Boilers;Commercial/Institutional;Anthracite Coal;Traveling Grate (Overfeed) Stoker | 0.02 |
| 10300208 | External Combustion Boilers;Commercial/Institutional;Bituminous Coal;Underfeed Stoker | 0.02 |
| 30300308 | Industrial Processes;Primary Metal Production;Metallurgical Coke Manufacturing;By-product Process: Oven/Door Leaks | 0.02 |
| 10300205 | External Combustion Boilers;Commercial/Institutional;Bituminous Coal;Pulverized Coal: Wet Bottom | 0.02 |
| 39000889 | Industrial Processes;In-process Fuel Use;Coke;General | 0.02 |
| 39000288 | Industrial Processes;In-process Fuel Use;Bituminous Coal;General (Subbituminous) | 0.02 |
| 20100301 | Internal Combustion Engines;Electric Generation;Gasified Coal;Turbine | 0.02 |
| 10300225 | External Combustion Boilers;Commercial/Institutional;Subbituminous Coal;Traveling Grate (Overfeed) Stoker | 0.02 |
| 10200104 | External Combustion Boilers;Industrial;Anthracite Coal;Traveling Grate (Overfeed) Stoker | 0.02 |
| 2102001000 | Stationary Source Fuel Combustion;Industrial;Anthracite Coal;Total: All Boiler Types | 0.02 |
| 10300206 | External Combustion Boilers;Commercial/Institutional;Bituminous Coal;Pulverized Coal: Dry Bottom | 0.01 |
| 30300310 | Industrial Processes;Primary Metal Production;Metallurgical Coke Manufacturing;Coal Crushing | 0.01 |
| 39000199 | Industrial Processes;In-process Fuel Use;Anthracite Coal;General | 0.01 |
| 30300318 | Industrial Processes;Primary Metal Production;Metallurgical Coke Manufacturing;By-product Process: Combustion Stack: Blast Furnace Gas (BFG) | 0.01 |
| 10300217 | External Combustion Boilers;Commercial/Institutional;Bituminous Coal;Atmospheric Fluidized Bed Combustion: Bubbling Bed | 0.01 |
| 10300203 | External Combustion Boilers;Commercial/Institutional;Bituminous Coal;Cyclone Furnace | 0.01 |
| 10200206 | External Combustion Boilers;Industrial;Bituminous Coal;Underfeed Stoker | 0.01 |
| 30302359 | Industrial Processes;Primary Metal Production;Taconite Iron Ore Processing;Induration: Grate/Kiln, Coal-fired, Acid Pellets | 0.01 |
| 10100225 | External Combustion Boilers;Electric Generation;Subbituminous Coal;Boiler, Traveling Grate (Overfeed) Stoker | 0.01 |
| 10300222 | External Combustion Boilers;Commercial/Institutional;Subbituminous Coal;Pulverized Coal: Dry Bottom | 0.01 |
| 10300224 | External Combustion Boilers;Commercial/Institutional;Subbituminous Coal;Spreader Stoker | 0.01 |
| 10300216 | External Combustion Boilers;Commercial/Institutional;Bituminous Coal;Pulverized Coal: Dry Bottom (Tangential) | 0.01 |
| 30500316 | Industrial Processes;Mineral Products;Brick Manufacture;Curing and Firing: Coal-fired Periodic Kilns | 0.01 |
| 10200117 | External Combustion Boilers;Industrial;Anthracite Coal;Fluidized Bed Boiler Burning Anthracite-Culm Fuel | < 0.01 |
| 30300316 | Industrial Processes;Primary Metal Production;Metallurgical Coke Manufacturing;Coal Storage Pile | < 0.01 |
| 30300309 | Industrial Processes;Primary Metal Production;Metallurgical Coke Manufacturing;Coal Conveying | < 0.01 |
| 30300305 | Industrial Processes;Primary Metal Production;Metallurgical Coke Manufacturing;Coal Unloading | < 0.01 |
| 10300214 | External Combustion Boilers;Commercial/Institutional;Bituminous Coal;Hand-fired | < 0.01 |
| 30300311 | Industrial Processes;Primary Metal Production;Metallurgical Coke Manufacturing;Coal Screening | < 0.01 |
| 2103001000 | Stationary Source Fuel Combustion;Commercial/Institutional;Anthracite Coal;Total: All Boiler Types | < 0.01 |
| 10300101 | External Combustion Boilers;Commercial/Institutional;Anthracite Coal;Pulverized Coal | < 0.01 |
| 30300361 | Industrial Processes;Primary Metal Production;Metallurgical Coke Manufacturing;By-product Process: Chemical Plant: Equipment Leaks | < 0.01 |
| 30300401 | Industrial Processes;Primary Metal Production;Coke Manufacture: Beehive Process;General | < 0.01 |
| 10200101 | External Combustion Boilers;Industrial;Anthracite Coal;Pulverized Coal | < 0.01 |
| 10100102 | External Combustion Boilers;Electric Generation;Anthracite Coal;Boiler, Traveling Grate (Overfeed) Stoker | < 0.01 |
| 10300103 | External Combustion Boilers;Commercial/Institutional;Anthracite Coal;Hand-fired | < 0.01 |

91112 – Natural Gas Combustion – Composite

The natural gas combustion composite emission source profile needs new data as well as an update in specificity due to the generalness of profile, as evident by the wide range of SCCs being applied to this one emission profile (Table S20).

**Table S20.** SCCs currently being applied to profile # 91112 in SPECIATE (Natural Gas Combustion – Composite).

|  |  |  |
| --- | --- | --- |
| SCC | SCC Description | % of Profile Mass |
| 20100201 | Internal Combustion Engines;Electric Generation;Natural Gas;Turbine | 24.84 |
| 20200201 | Internal Combustion Engines;Industrial;Natural Gas;Turbine | 5.25 |
| 10200602 | External Combustion Boilers;Industrial;Natural Gas;10-100 Million BTU/hr | 4.79 |
| 10200704 | External Combustion Boilers;Industrial;Process Gas;Blast Furnace Gas | 4.50 |
| 10200601 | External Combustion Boilers;Industrial;Natural Gas;> 100 Million BTU/hr | 4.27 |
| 2103006000 | Stationary Source Fuel Combustion;Commercial/Institutional;Natural Gas;Total: Boilers and IC Engines | 4.21 |
| 10100601 | External Combustion Boilers;Electric Generation;Natural Gas;Boiler, >= 100 Million BTU/hr | 3.51 |
| 20200203 | Internal Combustion Engines;Industrial;Natural Gas;Turbine: Cogeneration | 3.27 |
| 20200252 | Internal Combustion Engines;Industrial;Natural Gas;2-cycle Lean Burn | 2.77 |
| 2102006000 | Stationary Source Fuel Combustion;Industrial;Natural Gas;Total: Boilers and IC Engines | 2.39 |
| 20200202 | Internal Combustion Engines;Industrial;Natural Gas;Reciprocating | 2.17 |
| 10200701 | External Combustion Boilers;Industrial;Process Gas;Petroleum Refinery Gas | 2.15 |
| 20200254 | Internal Combustion Engines;Industrial;Natural Gas;4-cycle Lean Burn | 2.10 |
| 30500311 | Industrial Processes;Mineral Products;Brick Manufacture;Curing and Firing: Gas-fired Tunnel Kilns | 1.76 |
| 50100410 | Waste Disposal;Solid Waste Disposal - Government;Landfill Dump;Waste Gas Destruction: Waste Gas Flares | 1.69 |
| 20100802 | Internal Combustion Engines;Electric Generation;Landfill Gas;Reciprocating | 1.63 |
| 10100604 | External Combustion Boilers;Electric Generation;Natural Gas;Boiler, Tangentially Fired | 1.49 |
| 20200253 | Internal Combustion Engines;Industrial;Natural Gas;4-cycle Rich Burn | 1.43 |
| 10300602 | External Combustion Boilers;Commercial/Institutional;Natural Gas;10-100 Million BTU/hr | 1.38 |
| 30190003 | Industrial Processes;Chemical Manufacturing;Fuel Fired Equipment;Process Heater: Natural Gas | 1.24 |
| 30302352 | Industrial Processes;Primary Metal Production;Taconite Iron Ore Processing;Induration: Grate/Kiln, Gas-fired, Flux Pellets | 1.22 |
| 39000699 | Industrial Processes;In-process Fuel Use;Natural Gas;General | 1.19 |
| 31000414 | Industrial Processes;Oil and Gas Production;Process Heaters;Natural Gas: Steam Generators | 1.08 |
| 10200603 | External Combustion Boilers;Industrial;Natural Gas;< 10 Million BTU/hr | 0.98 |
| 30390024 | Industrial Processes;Primary Metal Production;Fuel Fired Equipment;Process Gas: Flares | 0.86 |
| 20100209 | Internal Combustion Engines;Electric Generation;Natural Gas;Turbine: Exhaust | 0.79 |
| 31000404 | Industrial Processes;Oil and Gas Production;Process Heaters;Natural Gas | 0.62 |
| 20300203 | Internal Combustion Engines;Commercial/Institutional;Natural Gas;Turbine: Cogeneration | 0.58 |
| 30302351 | Industrial Processes;Primary Metal Production;Taconite Iron Ore Processing;Induration: Grate/Kiln, Gas-fired, Acid Pellets | 0.57 |
| 30590003 | Industrial Processes;Mineral Products;Fuel Fired Equipment;Natural Gas: Process Heaters | 0.56 |
| 30600105 | Industrial Processes;Petroleum Industry;Process Heaters;Natural Gas-fired | 0.56 |
| 10300601 | External Combustion Boilers;Commercial/Institutional;Natural Gas;> 100 Million BTU/hr | 0.55 |
| 30302381 | Industrial Processes;Primary Metal Production;Taconite Iron Ore Processing;Induration: Straight Grate, Gas-fired, Acid Pellets | 0.55 |
| 10200604 | External Combustion Boilers;Industrial;Natural Gas;Cogeneration | 0.54 |
| 10200707 | External Combustion Boilers;Industrial;Process Gas;Coke Oven Gas | 0.53 |
| 30290003 | Industrial Processes;Food and Agriculture;Fuel Fired Equipment;Natural Gas: Process Heaters | 0.52 |
| 10300603 | External Combustion Boilers;Commercial/Institutional;Natural Gas;< 10 Million BTU/hr | 0.49 |
| 30190004 | Industrial Processes;Chemical Manufacturing;Fuel Fired Equipment;Process Heater: Process Gas | 0.44 |
| 50200601 | Waste Disposal;Solid Waste Disposal - Commercial/Institutional;Landfill Dump;Waste Gas Flares \*\* (Use 5-01-004-10) | 0.43 |
| 10200799 | External Combustion Boilers;Industrial;Process Gas;Other: Specify in Comments | 0.43 |
| 50300601 | Waste Disposal;Solid Waste Disposal - Industrial;Landfill Dump;Waste Gas Flares | 0.42 |
| 39900601 | Industrial Processes;Miscellaneous Manufacturing Industries;Process Heater/Furnace;Natural Gas | 0.42 |
| 20300202 | Internal Combustion Engines;Commercial/Institutional;Natural Gas;Turbine | 0.39 |
| 20100202 | Internal Combustion Engines;Electric Generation;Natural Gas;Reciprocating | 0.39 |
| 30390003 | Industrial Processes;Primary Metal Production;Fuel Fired Equipment;Natural Gas: Process Heaters | 0.37 |
| 10201401 | External Combustion Boilers;Industrial;CO Boiler;Natural Gas | 0.36 |
| 10500106 | External Combustion;Space Heaters;Industrial;Natural Gas | 0.35 |
| 20100801 | Internal Combustion Engines;Electric Generation;Landfill Gas;Turbine | 0.34 |
| 10100602 | External Combustion Boilers;Electric Generation;Natural Gas;Boiler < 100 Million BTU, except tangential | 0.31 |
| 20300201 | Internal Combustion Engines;Commercial/Institutional;Natural Gas;Reciprocating | 0.30 |
| 10201402 | External Combustion Boilers;Industrial;CO Boiler;Process Gas | 0.29 |
| 30190013 | Industrial Processes;Chemical Manufacturing;Fuel Fired Equipment;Incinerator: Natural Gas | 0.27 |
| 30490033 | Industrial Processes;Secondary Metal Production;Fuel Fired Equipment;Natural Gas: Furnaces | 0.27 |
| 30390004 | Industrial Processes;Primary Metal Production;Fuel Fired Equipment;Process Gas: Process Heaters | 0.26 |
| 20101001 | Internal Combustion Engines;Electric Generation;Geysers/Geothermal;Steam Turbine | 0.22 |
| 50100421 | Waste Disposal;Solid Waste Disposal - Government;Landfill Dump;Waste Gas Recovery: Internal Combustion Device | 0.22 |
| 30500850 | Industrial Processes;Mineral Products;Ceramic Clay/Tile Manufacture;Firing - Natural Gas-fired Kiln | 0.21 |
| 30490003 | Industrial Processes;Secondary Metal Production;Fuel Fired Equipment;Natural Gas: Process Heaters | 0.20 |
| 30190014 | Industrial Processes;Chemical Manufacturing;Fuel Fired Equipment;Incinerator: Process Gas | 0.20 |
| 20300802 | Internal Combustion Engines;Commercial/Institutional;Landfill Gas;Reciprocating | 0.19 |
| 30990003 | Industrial Processes;Fabricated Metal Products;Fuel Fired Equipment;Natural Gas: Process Heaters | 0.18 |
| 31000415 | Industrial Processes;Oil and Gas Production;Process Heaters;Process Gas: Steam Generators | 0.16 |
| 20300801 | Internal Combustion Engines;Commercial/Institutional;Landfill Gas;Turbine | 0.16 |
| 40201001 | Chemical Evaporation;Surface Coating Operations;Coating Oven Heater;Natural Gas | 0.15 |
| 20200705 | Internal Combustion Engines;Industrial;Process Gas;Refinery Gas: Turbine | 0.15 |
| 2102007000 | Stationary Source Fuel Combustion;Industrial;Liquified Petroleum Gas (LPG);Total: All Boiler Types | 0.14 |
| 39000603 | Industrial Processes;In-process Fuel Use;Natural Gas;Lime Kiln | 0.13 |
| 30302312 | Industrial Processes;Primary Metal Production;Taconite Iron Ore Processing;Indurating Furnace: Gas Fired\*\* (see 3-03-023-51 thru -88) | 0.13 |
| 10500206 | External Combustion;Space Heaters;Commercial/Institutional;Natural Gas | 0.12 |
| 39990003 | Industrial Processes;Miscellaneous Manufacturing Industries;Miscellaneous Manufacturing Industries;Natural Gas: Process Heaters | 0.12 |
| 20200714 | Internal Combustion Engines;Industrial;Process Gas;Turbine: Exhaust | 0.11 |
| 20100807 | Internal Combustion Engines;Electric Generation;Landfill Gas;Reciprocating: Exhaust | 0.10 |
| 10300799 | External Combustion Boilers;Commercial/Institutional;Process Gas;Other Not Classified | 0.09 |
| 30501619 | Industrial Processes;Mineral Products;Lime Manufacture;Calcining: Gas-fired Rotary Kiln | 0.08 |
| 30302382 | Industrial Processes;Primary Metal Production;Taconite Iron Ore Processing;Induration: Straight Grate, Gas-fired, Flux Pellets | 0.08 |
| 2103007000 | Stationary Source Fuel Combustion;Commercial/Institutional;Liquified Petroleum Gas (LPG);Total: All Combustor Types | 0.07 |
| 10100701 | External Combustion Boilers;Electric Generation;Process Gas;Boiler, >= 100 Million BTU/hr | 0.07 |
| 20300702 | Internal Combustion Engines;Commercial/Institutional;Digester Gas;Reciprocating: POTW Digester Gas | 0.07 |
| 31000160 | Industrial Processes;Oil and Gas Production;Crude Oil Production;Flares | 0.07 |
| 10100702 | External Combustion Boilers;Electric Generation;Process Gas;Boiler < 100 Million Btu/hr | 0.06 |
| 10300701 | External Combustion Boilers;Commercial/Institutional;Process Gas;POTW Digester Gas-fired Boiler | 0.06 |
| 20200256 | Internal Combustion Engines;Industrial;Natural Gas;4-cycle Clean Burn | 0.06 |
| 20200209 | Internal Combustion Engines;Industrial;Natural Gas;Turbine: Exhaust | 0.06 |
| 30190023 | Industrial Processes;Chemical Manufacturing;Fuel Fired Equipment;Flare: Natural Gas | 0.06 |
| 40290013 | Chemical Evaporation;Surface Coating Operations;Fuel Fired Equipment;Natural Gas: Incinerator/Afterburner | 0.06 |
| 10301002 | External Combustion Boilers;Commercial/Institutional;Liquified Petroleum Gas (LPG);Propane | 0.05 |
| 10300811 | External Combustion Boilers;Commercial/Institutional;Landfill Gas;Landfill Gas | 0.05 |
| 30609903 | Industrial Processes;Petroleum Industry;Incinerators;Natural Gas | 0.05 |
| 30700752 | Industrial Processes;Pulp and Paper and Wood Products;Plywood Operations;Softwood Veneer Dryer: Direct Natural Gas-fired: Heated Zones | 0.04 |
| 10200710 | External Combustion Boilers;Industrial;Process Gas;Cogeneration | 0.04 |
| 20200255 | Internal Combustion Engines;Industrial;Natural Gas;2-cycle Clean Burn | 0.04 |
| 10201002 | External Combustion Boilers;Industrial;Liquified Petroleum Gas (LPG);Propane | 0.04 |
| 30500206 | Industrial Processes;Mineral Products;Asphalt Concrete;Asphalt Heater: Natural Gas | 0.04 |
| 20100809 | Internal Combustion Engines;Electric Generation;Landfill Gas;Turbine: Exhaust | 0.03 |
| 30501623 | Industrial Processes;Mineral Products;Lime Manufacture;Calcining: Gas-fired Parallel Flow Regenerative Kiln | 0.03 |
| 20200204 | Internal Combustion Engines;Industrial;Natural Gas;Reciprocating: Cogeneration | 0.03 |
| 30600903 | Industrial Processes;Petroleum Industry;Flares;Natural Gas | 0.03 |
| 50100789 | Waste Disposal;Solid Waste Disposal - Government;Sewage Treatment;Sludge Digester Gas Flare | 0.03 |
| 39990013 | Industrial Processes;Miscellaneous Manufacturing Industries;Miscellaneous Manufacturing Industries;Natural Gas: Incinerators | 0.03 |
| 30600108 | Industrial Processes;Petroleum Industry;Process Heaters;Landfill Gas-fired | 0.02 |
| 20300809 | Internal Combustion Engines;Commercial/Institutional;Landfill Gas;Turbine: Exhaust | 0.02 |
| 20201607 | Internal Combustion Engines;Industrial;Methanol;Reciprocating: Exhaust | 0.02 |
| 30291001 | Industrial Processes;Food and Agriculture;Fuel Fired Equipment;Broiling Food: Natural Gas | 0.02 |
| 50290010 | Waste Disposal;Solid Waste Disposal - Commercial/Institutional;Auxillary Fuel/No Emissions;Liquified Petroleum Gas (LPG) | 0.02 |
| 30590013 | Industrial Processes;Mineral Products;Fuel Fired Equipment;Natural Gas: Incinerators | 0.02 |
| 50100420 | Waste Disposal;Solid Waste Disposal - Government;Landfill Dump;Waste Gas Recovery: Gas Turbines | 0.02 |
| 50100412 | Waste Disposal;Solid Waste Disposal - Government;Landfill Dump;Waste Gas Destruction: Other | 0.02 |
| 50290006 | Waste Disposal;Solid Waste Disposal - Commercial/Institutional;Auxillary Fuel/No Emissions;Natural Gas | 0.02 |
| 30500314 | Industrial Processes;Mineral Products;Brick Manufacture;Curing and Firing: Gas-fired Periodic Kilns | 0.02 |
| 20100206 | Internal Combustion Engines;Electric Generation;Natural Gas;Reciprocating: Evaporative Losses (Fuel Delivery System) | 0.02 |
| 50190006 | Waste Disposal;Solid Waste Disposal - Government;Auxillary Fuel/No Emissions;Natural Gas | 0.02 |
| 39000602 | Industrial Processes;In-process Fuel Use;Natural Gas;Cement Kiln/Dryer | 0.02 |
| 30700756 | Industrial Processes;Pulp and Paper and Wood Products;Plywood Operations;Hardwood Veneer Dryer: Indirect-heated: Heated Zones | 0.02 |
| 10101002 | External Combustion Boilers;Electric Generation;Liquified Petroleum Gas (LPG);Propane | 0.01 |
| 20400301 | Internal Combustion Engines;Engine Testing;Turbine;Natural Gas | 0.01 |
| 39001099 | Industrial Processes;In-process Fuel Use;Liquified Petroleum Gas;General | 0.01 |
| 20200701 | Internal Combustion Engines;Industrial;Process Gas;Turbine | 0.01 |
| 20300204 | Internal Combustion Engines;Commercial/Institutional;Natural Gas;Reciprocating: Cogeneration | 0.01 |
| 20300209 | Internal Combustion Engines;Commercial/Institutional;Natural Gas;Turbine: Exhaust | 0.01 |
| 30890003 | Industrial Processes;Rubber and Miscellaneous Plastics Products;Fuel Fired Equipment;Natural Gas: Process Heaters | 0.01 |
| 31000209 | Industrial Processes;Oil and Gas Production;Natural Gas Production;Incinerators Burning Waste Gas or Augmented Waste Gas | 0.01 |
| 20100207 | Internal Combustion Engines;Electric Generation;Natural Gas;Reciprocating: Exhaust | 0.01 |
| 10201601 | External Combustion Boilers;Industrial;Methanol;Industrial Boiler | 0.01 |
| 10100703 | External Combustion Boilers;Electric Generation;Petroleum Refinery Gas;Boiler | 0.01 |
| 20100702 | Internal Combustion Engines;Electric Generation;Process Gas;Reciprocating | 0.01 |
| 50390006 | Waste Disposal;Solid Waste Disposal - Industrial;Auxillary Fuel/No Emissions;Natural Gas | 0.01 |
| 50390007 | Waste Disposal;Solid Waste Disposal - Industrial;Auxillary Fuel/No Emissions;Process Gas | 0.01 |
| 30390013 | Industrial Processes;Primary Metal Production;Fuel Fired Equipment;Natural Gas: Incinerators | 0.01 |
| 30500332 | Industrial Processes;Mineral Products;Brick Manufacture;Curing and Firing: Gas-fired Kiln, Other Type | 0.01 |
| 39901001 | Industrial Processes;Miscellaneous Manufacturing Industries;Process Heater/Furnace;LPG | 0.01 |
| 20200702 | Internal Combustion Engines;Industrial;Process Gas;Reciprocating Engine | 0.01 |
| 20300701 | Internal Combustion Engines;Commercial/Institutional;Digester Gas;Turbine | 0.01 |
| 30990013 | Industrial Processes;Fabricated Metal Products;Fuel Fired Equipment;Natural Gas: Incinerators | 0.01 |
| 49090013 | Chemical Evaporation;Organic Solvent Evaporation;Fuel Fired Equipment;Incinerator: Natural Gas | 0.01 |
| 39990023 | Industrial Processes;Miscellaneous Manufacturing Industries;Miscellaneous Manufacturing Industries;Natural Gas: Flares | 0.01 |
| 30701020 | Industrial Processes;Pulp and Paper and Wood Products;Oriented Strandboard (OSB) Manufacture;Rotary Strand Dryer: Direct Natural Gas-fired: Hardwood | 0.01 |
| 30600905 | Industrial Processes;Petroleum Industry;Flares;Liquified Petroleum Gas | 0.01 |
| 30590005 | Industrial Processes;Mineral Products;Fuel Fired Equipment;Liquified Petroleum Gas (LPG): Process Heaters | 0.01 |
| 20100707 | Internal Combustion Engines;Electric Generation;Process Gas;Reciprocating: Exhaust | 0.01 |
| 30890013 | Industrial Processes;Rubber and Miscellaneous Plastics Products;Fuel Fired Equipment;Natural Gas: Incinerators | 0.01 |
| 30390023 | Industrial Processes;Primary Metal Production;Fuel Fired Equipment;Natural Gas: Flares | 0.01 |
| 20201609 | Internal Combustion Engines;Industrial;Methanol;Turbine: Exhaust | < 0.01 |
| 39000605 | Industrial Processes;In-process Fuel Use;Natural Gas;Metal Melting \*\* | < 0.01 |
| 20400404 | Internal Combustion Engines;Engine Testing;Reciprocating Engine;Process Gas | < 0.01 |
| 30490013 | Industrial Processes;Secondary Metal Production;Fuel Fired Equipment;Natural Gas: Incinerators | < 0.01 |
| 30490004 | Industrial Processes;Secondary Metal Production;Fuel Fired Equipment;Process Gas: Process Heaters | < 0.01 |
| 30302345 | Industrial Processes;Primary Metal Production;Taconite Iron Ore Processing;Bentonite Transfer to Blending | < 0.01 |
| 31390003 | Industrial Processes;Electrical Equipment;Process Heaters;Natural Gas | < 0.01 |
| 30609905 | Industrial Processes;Petroleum Industry;Incinerators;Liquified Petroleum Gas | < 0.01 |
| 50100411 | Waste Disposal;Solid Waste Disposal - Government;Landfill Dump;Waste Gas Destruction: Incinerators | < 0.01 |
| 10500110 | External Combustion;Space Heaters;Industrial;Liquified Petroleum Gas (LPG) | < 0.01 |
| 30500840 | Industrial Processes;Mineral Products;Ceramic Clay/Tile Manufacture;Presinter Thermal Processing - Natural Gas-fired Kiln | < 0.01 |
| 30490023 | Industrial Processes;Secondary Metal Production;Fuel Fired Equipment;Natural Gas: Flares | < 0.01 |
| 30505020 | Industrial Processes;Mineral Products;Asphalt Processing (Blowing);Asphalt Heater: Natural Gas | < 0.01 |
| 10301003 | External Combustion Boilers;Commercial/Institutional;Liquified Petroleum Gas (LPG);Butane/Propane Mixture: Specify Percent Butane in Comments | < 0.01 |
| 30490034 | Industrial Processes;Secondary Metal Production;Fuel Fired Equipment;Process Gas: Furnaces | < 0.01 |
| 10201003 | External Combustion Boilers;Industrial;Liquified Petroleum Gas (LPG);Butane/Propane Mixture: Specify Percent Butane in Comments | < 0.01 |
| 30490024 | Industrial Processes;Secondary Metal Production;Fuel Fired Equipment;Process Gas: Flares | < 0.01 |
| 20200712 | Internal Combustion Engines;Industrial;Process Gas;Reciprocating: Exhaust | < 0.01 |
| 20201001 | Internal Combustion Engines;Industrial;Liquified Petroleum Gas (LPG);Propane: Reciprocating | < 0.01 |
| 40290023 | Chemical Evaporation;Surface Coating Operations;Fuel Fired Equipment;Natural Gas: Flares | < 0.01 |
| 30500821 | Industrial Processes;Mineral Products;Ceramic Clay/Tile Manufacture;Calcining-Natural Gas-fired Rotary Calciner | < 0.01 |
| 30700753 | Industrial Processes;Pulp and Paper and Wood Products;Plywood Operations;Softwood Veneer Dryer: Direct Natural Gas-fired: Cooling Section | < 0.01 |
| 30700611 | Industrial Processes;Pulp and Paper and Wood Products;Particleboard Manufacture;Direct Natural Gas-Fired Rotary Dryer, Unspecified Pines | < 0.01 |
| 20201013 | Internal Combustion Engines;Industrial;Liquified Petroleum Gas (LPG);Turbine: Cogeneration | < 0.01 |
| 30290005 | Industrial Processes;Food and Agriculture;Fuel Fired Equipment;Liquified Petroleum Gas (LPG): Process Heaters | < 0.01 |
| 20301001 | Internal Combustion Engines;Commercial/Institutional;Liquified Petroleum Gas (LPG);Propane: Reciprocating | < 0.01 |
| 10101501 | External Combustion Boilers;Electric Generation;Geothermal Power Plants;Geothermal Power Plant: Off-gas Ejectors | < 0.01 |
| 20300705 | Internal Combustion Engines;Commercial/Institutional;Digester Gas;Reciprocating: Crankcase Blowby | < 0.01 |
| 50300789 | Waste Disposal;Solid Waste Disposal - Industrial;Liquid Waste;Sludge Digester Gas Flare | < 0.01 |
| 10500210 | External Combustion;Space Heaters;Commercial/Institutional;Liquified Petroleum Gas (LPG) | < 0.01 |
| 30500209 | Industrial Processes;Mineral Products;Asphalt Concrete;Asphalt Heater: LPG | < 0.01 |
| 50490004 | Waste Disposal;Site Remediation;General Processes;Incinerators: Process Gas | < 0.01 |
| 40201004 | Chemical Evaporation;Surface Coating Operations;Coating Oven Heater;Liquified Petroleum Gas (LPG) | < 0.01 |
| 30490014 | Industrial Processes;Secondary Metal Production;Fuel Fired Equipment;Process Gas: Incinerators | < 0.01 |
| 49090023 | Chemical Evaporation;Organic Solvent Evaporation;Fuel Fired Equipment;Flare: Natural Gas | < 0.01 |
| 30508909 | Industrial Processes;Mineral Products;Talc Processing;Natural Gas Fired Crude Ore Dryer | < 0.01 |
| 39900801 | Industrial Processes;Miscellaneous Manufacturing Industries;Process Heater/Furnace;Landfill Gas | < 0.01 |
| 30990023 | Industrial Processes;Fabricated Metal Products;Fuel Fired Equipment;Natural Gas: Flares | < 0.01 |
| 27300320 | Internal Combustion Engines;Off-highway LPG-fueled Engines;Industrial Equipment;Industrial Fork Lift: Liquified Petroleum Gas (LPG) | < 0.01 |
| 20201011 | Internal Combustion Engines;Industrial;Liquified Petroleum Gas (LPG);Turbine | < 0.01 |
| 20400409 | Internal Combustion Engines;Engine Testing;Reciprocating Engine;Liquified Petroleum Gas (LPG) | < 0.01 |
| 50100423 | Waste Disposal;Solid Waste Disposal - Government;Landfill Dump;Waste Gas Recovery: Boiler | < 0.01 |
| 30302354 | Industrial Processes;Primary Metal Production;Taconite Iron Ore Processing;Induration: Grate/Kiln, Gas & Oil-fired, Flux Pellets | < 0.01 |
| 20300207 | Internal Combustion Engines;Commercial/Institutional;Natural Gas;Reciprocating: Exhaust | < 0.01 |
| 30390014 | Industrial Processes;Primary Metal Production;Fuel Fired Equipment;Process Gas: Incinerators | < 0.01 |
| 20201002 | Internal Combustion Engines;Industrial;Liquified Petroleum Gas (LPG);Butane: Reciprocating | < 0.01 |
| 20101030 | Internal Combustion Engines;Electric Generation;Geysers/Geothermal;Pipeline Fugitives: Blowdown | < 0.01 |
| 49090015 | Chemical Evaporation;Organic Solvent Evaporation;Fuel Fired Equipment;Other Incinerators: Recovered Solvents | < 0.01 |
| 20201012 | Internal Combustion Engines;Industrial;Liquified Petroleum Gas (LPG);Reciprocating Engine | < 0.01 |
| 10101001 | External Combustion Boilers;Electric Generation;Liquified Petroleum Gas (LPG);Butane | < 0.01 |
| 20100805 | Internal Combustion Engines;Electric Generation;Landfill Gas;Reciprocating: Crankcase Blowby | < 0.01 |
| 50100422 | Waste Disposal;Solid Waste Disposal - Government;Landfill Dump;Waste Gas Recovery: Other | < 0.01 |
| 50190010 | Waste Disposal;Solid Waste Disposal - Government;Auxillary Fuel/No Emissions;Liquified Petroleum Gas (LPG) | < 0.01 |
| 30890004 | Industrial Processes;Rubber and Miscellaneous Plastics Products;Fuel Fired Equipment;Liquified Petroleum Gas (LPG): Process Heaters | < 0.01 |
| 10301001 | External Combustion Boilers;Commercial/Institutional;Liquified Petroleum Gas (LPG);Butane | < 0.01 |
| 20101020 | Internal Combustion Engines;Electric Generation;Geysers/Geothermal;Well Pad Fugitives: Blowdown | < 0.01 |
| 30700750 | Industrial Processes;Pulp and Paper and Wood Products;Plywood Operations;Direct Natural Gas-Fired Dryer: Non-specified Pine Species Veneer | < 0.01 |
| 20200207 | Internal Combustion Engines;Industrial;Natural Gas;Reciprocating: Exhaust | < 0.01 |
| 10201001 | External Combustion Boilers;Industrial;Liquified Petroleum Gas (LPG);Butane | < 0.01 |
| 20200251 | Internal Combustion Engines;Industrial;Natural Gas;2-cycle Rich Burn | < 0.01 |
| 10100704 | External Combustion Boilers;Electric Generation;Process Gas;Blast Furnace Gas | < 0.01 |
| 50390010 | Waste Disposal;Solid Waste Disposal - Industrial;Auxillary Fuel/No Emissions;Liquified Petroleum Gas (LPG) | < 0.01 |
| 20200205 | Internal Combustion Engines;Industrial;Natural Gas;Reciprocating: Crankcase Blowby | < 0.01 |
| 30890023 | Industrial Processes;Rubber and Miscellaneous Plastics Products;Fuel Fired Equipment;Natural Gas: Flares | < 0.01 |
| 50100432 | Waste Disposal;Solid Waste Disposal - Government;Landfill Dump;Waste Gas Purification: Membranes | < 0.01 |
| 30505023 | Industrial Processes;Mineral Products;Asphalt Processing (Blowing);Asphalt Heater: LP Gas | < 0.01 |
| 30490035 | Industrial Processes;Secondary Metal Production;Fuel Fired Equipment;Propane: Furnaces | < 0.01 |
| 30600107 | Industrial Processes;Petroleum Industry;Process Heaters;LPG-fired | < 0.01 |
| 20200706 | Internal Combustion Engines;Industrial;Process Gas;Refinery Gas: Reciprocating Engine | < 0.01 |
| 30400407 | Industrial Processes;Secondary Metal Production;Lead;Pot Furnace Heater: Natural Gas | < 0.01 |
| 20300206 | Internal Combustion Engines;Commercial/Institutional;Natural Gas;Reciprocating: Evaporative Losses (Fuel Delivery System) | < 0.01 |
| 20300707 | Internal Combustion Engines;Commercial/Institutional;Digester Gas;Reciprocating: Exhaust | < 0.01 |
| 20201007 | Internal Combustion Engines;Industrial;Liquified Petroleum Gas (LPG);Reciprocating: Exhaust | < 0.01 |

91113 – Nonroad Gasoline Exhaust – Composite

The emission source profile for nonroad gasoline exhaust is also both in need of new measurements, based on the categories represented by the SCCs applied to the profile as well as in need of an update based on specificity, due to the variety of SCCs currently being applied in the emissions modeling platform (Table S21). The source categories in most need of source testing are gasoline powered chain saws, snowmobiles, outboard motors for boats, motorcycles, all-terrain vehicles, leaf blowers and commercial edgers.

**Table S21.** SCCs currently being applied to profile # 91113 in SPECIATE (Nonroad Gasoline Exhaust – Composite).

|  |  |  |
| --- | --- | --- |
| **SCC** | **SCC Description** | **% of Profile Mass** |
| 2260004021 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Lawn and Garden Equipment;Chain Saws < 6 HP (Commercial) | 12.04 |
| 2260001020 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Recreational Equipment;Snowmobiles | 10.95 |
| 2282005010 | Mobile Sources;Pleasure Craft;Gasoline 2-Stroke;Outboard | 10.35 |
| 2260001010 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Recreational Equipment;Motorcycles: Off-road | 9.06 |
| 2260001030 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Recreational Equipment;All Terrain Vehicles | 8.80 |
| 2260004031 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Lawn and Garden Equipment;Leafblowers/Vacuums (Commercial) | 7.09 |
| 2260004026 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Lawn and Garden Equipment;Trimmers/Edgers/Brush Cutters (Commercial) | 6.09 |
| 2282005015 | Mobile Sources;Pleasure Craft;Gasoline 2-Stroke;Personal Water Craft | 4.92 |
| 2260004025 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Lawn and Garden Equipment;Trimmers/Edgers/Brush Cutters (Residential) | 2.72 |
| 2260002039 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Construction and Mining Equipment;Concrete/Industrial Saws | 2.61 |
| 2260006010 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Commercial Equipment;Pumps | 2.08 |
| 2265001030 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Recreational Equipment;All Terrain Vehicles | 1.95 |
| 2260004020 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Lawn and Garden Equipment;Chain Saws < 6 HP (Residential) | 1.89 |
| 2260004030 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Lawn and Garden Equipment;Leafblowers/Vacuums (Residential) | 1.70 |
| 2265004071 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Lawn and Garden Equipment;Turf Equipment (Commercial) | 1.57 |
| 2260007005 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Logging Equipment;Chain Saws : 6 HP | 1.53 |
| 2265004010 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Lawn and Garden Equipment;Lawn Mowers (Residential) | 1.16 |
| 2265006005 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Commercial Equipment;Generator Sets | 1.13 |
| 2265004055 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Lawn and Garden Equipment;Lawn and Garden Tractors (Residential) | 0.98 |
| 2260002006 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Construction and Mining Equipment;Tampers/Rammers | 0.89 |
| 2282010005 | Mobile Sources;Pleasure Craft;Gasoline 4-Stroke;Inboard/Sterndrive | 0.88 |
| 2265004011 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Lawn and Garden Equipment;Lawn Mowers (Commercial) | 0.85 |
| 2260004036 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Lawn and Garden Equipment;Snowblowers (Commercial) | 0.74 |
| 2265006030 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Commercial Equipment;Pressure Washers | 0.64 |
| 2265006010 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Commercial Equipment;Pumps | 0.62 |
| 2265003060 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Industrial Equipment;AC\\Refrigeration | 0.60 |
| 2265006025 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Commercial Equipment;Welders | 0.59 |
| 2260004016 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Lawn and Garden Equipment;Rotary Tillers < 6 HP (Commercial) | 0.58 |
| 2260004035 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Lawn and Garden Equipment;Snowblowers (Residential) | 0.39 |
| 2265004056 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Lawn and Garden Equipment;Lawn and Garden Tractors (Commercial) | 0.39 |
| 2265004016 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Lawn and Garden Equipment;Rotary Tillers < 6 HP (Commercial) | 0.34 |
| 2260006005 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Commercial Equipment;Generator Sets | 0.28 |
| 2265004031 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Lawn and Garden Equipment;Leafblowers/Vacuums (Commercial) | 0.25 |
| 2265001050 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Recreational Equipment;Golf Carts | 0.23 |
| 2265006015 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Commercial Equipment;Air Compressors | 0.22 |
| 2265001010 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Recreational Equipment;Motorcycles: Off-road | 0.22 |
| 2265004066 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Lawn and Garden Equipment;Chippers/Stump Grinders (Commercial) | 0.15 |
| 2260004015 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Lawn and Garden Equipment;Rotary Tillers < 6 HP (Residential) | 0.14 |
| 2265002021 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Construction and Mining Equipment;Paving Equipment | 0.12 |
| 2265002039 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Construction and Mining Equipment;Concrete/Industrial Saws | 0.11 |
| 2265002030 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Construction and Mining Equipment;Trenchers | 0.09 |
| 2265002072 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Construction and Mining Equipment;Skid Steer Loaders | 0.09 |
| 2265004015 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Lawn and Garden Equipment;Rotary Tillers < 6 HP (Residential) | 0.09 |
| 2265007010 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Logging Equipment;Shredders : 6 HP | 0.09 |
| 2265004076 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Lawn and Garden Equipment;Other Lawn and Garden Equipment (Commercial) | 0.08 |
| 2265003020 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Industrial Equipment;Forklifts | 0.08 |
| 2265004041 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Lawn and Garden Equipment;Rear Engine Riding Mowers (Commercial) | 0.08 |
| 2265004040 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Lawn and Garden Equipment;Rear Engine Riding Mowers (Residential) | 0.08 |
| 2265002042 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Construction and Mining Equipment;Cement and Mortar Mixers | 0.08 |
| 2260005035 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Agricultural Equipment;Sprayers | 0.07 |
| 2265004075 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Lawn and Garden Equipment;Other Lawn and Garden Equipment (Residential) | 0.07 |
| 2265005060 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Agricultural Equipment;Irrigation Sets | 0.07 |
| 2265002024 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Construction and Mining Equipment;Surfacing Equipment | 0.07 |
| 20201702 | Internal Combustion Engines;Industrial;Gasoline;Reciprocating Engine | 0.06 |
| 2265005040 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Agricultural Equipment;Tillers : 6 HP | 0.06 |
| 20400401 | Internal Combustion Engines;Engine Testing;Reciprocating Engine;Gasoline | 0.06 |
| 2265002009 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Construction and Mining Equipment;Plate Compactors | 0.06 |
| 2265004046 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Lawn and Garden Equipment;Front Mowers (Commercial) | 0.05 |
| 2265008005 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Airport Ground Support Equipment;Airport Ground Support Equipment | 0.05 |
| 2265005035 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Agricultural Equipment;Sprayers | 0.05 |
| 2265004051 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Lawn and Garden Equipment;Shredders < 6 HP (Commercial) | 0.05 |
| 2265002015 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Construction and Mining Equipment;Rollers | 0.04 |
| 2265004036 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Lawn and Garden Equipment;Snowblowers (Commercial) | 0.04 |
| 2265003040 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Industrial Equipment;Other General Industrial Equipment | 0.04 |
| 2265010010 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Industrial Equipment;Other Oil Field Equipment | 0.04 |
| 2260002009 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Construction and Mining Equipment;Plate Compactors | 0.04 |
| 2265006035 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Commercial Equipment;Hydro-power Units | 0.04 |
| 2260002021 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Construction and Mining Equipment;Paving Equipment | 0.03 |
| 20300301 | Internal Combustion Engines;Commercial/Institutional;Gasoline;Reciprocating | 0.03 |
| 2260001060 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Recreational Equipment;Specialty Vehicles/Carts | 0.03 |
| 2265003010 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Industrial Equipment;Aerial Lifts | 0.03 |
| 2265002066 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Construction and Mining Equipment;Tractors/Loaders/Backhoes | 0.02 |
| 2265001060 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Recreational Equipment;Specialty Vehicles/Carts | 0.02 |
| 2265005015 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Agricultural Equipment;Agricultural Tractors | 0.02 |
| 2265004035 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Lawn and Garden Equipment;Snowblowers (Residential) | 0.02 |
| 2265002060 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Construction and Mining Equipment;Rubber Tire Loaders | 0.02 |
| 2265003030 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Industrial Equipment;Sweepers/Scrubbers | 0.02 |
| 2265005055 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Agricultural Equipment;Other Agricultural Equipment | 0.02 |
| 2265005010 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Agricultural Equipment;2-Wheel Tractors | 0.02 |
| 2265005030 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Agricultural Equipment;Agricultural Mowers | 0.02 |
| 2265002033 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Construction and Mining Equipment;Bore/Drill Rigs | 0.01 |
| 2260006035 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Commercial Equipment;Hydro-power Units | 0.01 |
| 2265002003 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Construction and Mining Equipment;Pavers | 0.01 |
| 2265004026 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Lawn and Garden Equipment;Trimmers/Edgers/Brush Cutters (Commercial) | 0.01 |
| 2265004030 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Lawn and Garden Equipment;Leafblowers/Vacuums (Residential) | 0.01 |
| 2265005045 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Agricultural Equipment;Swathers | 0.01 |
| 20201701 | Internal Combustion Engines;Industrial;Gasoline;Turbine | 0.01 |
| 2265002078 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Construction and Mining Equipment;Dumpers/Tenders | 0.01 |
| 2260002054 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Construction and Mining Equipment;Crushing/Processing Equipment | 0.01 |
| 2260003030 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Industrial Equipment;Sweepers/Scrubbers | 0.01 |
| 2265004025 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Lawn and Garden Equipment;Trimmers/Edgers/Brush Cutters (Residential) | 0.01 |
| 2265005025 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Agricultural Equipment;Balers | 0.01 |
| 2260004071 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Lawn and Garden Equipment;Turf Equipment (Commercial) | < 0.01 |
| 2265002054 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Construction and Mining Equipment;Crushing/Processing Equipment | < 0.01 |
| 2265003070 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Industrial Equipment;Terminal Tractors | < 0.01 |
| 20400499 | Internal Combustion Engines;Engine Testing;Reciprocating Engine;Other Not Classified | < 0.01 |
| 2285004015 | Mobile Sources;Railroad Equipment;Gasoline, 4-Stroke;Railway Maintenance | < 0.01 |
| 2265002057 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Construction and Mining Equipment;Rough Terrain Forklifts | < 0.01 |
| 2265004050 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Lawn and Garden Equipment;Shredders < 6 HP (Residential) | < 0.01 |
| 2265002027 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Construction and Mining Equipment;Signal Boards/Light Plants | < 0.01 |
| 2265002081 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Construction and Mining Equipment;Other Construction Equipment | < 0.01 |
| 2265002045 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Construction and Mining Equipment;Cranes | < 0.01 |
| 2265003050 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Industrial Equipment;Other Material Handling Equipment | < 0.01 |
| 2265002006 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Construction and Mining Equipment;Tampers/Rammers | < 0.01 |
| 2260006015 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Commercial Equipment;Air Compressors | < 0.01 |
| 2265007015 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Logging Equipment;Forest Eqp - Feller/Bunch/Skidder | < 0.01 |
| 2265005020 | Mobile Sources;Off-highway Vehicle Gasoline, 4-Stroke;Agricultural Equipment;Combines | < 0.01 |
| 2260003040 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Industrial Equipment;Other General Industrial Equipment | < 0.01 |
| 2260002027 | Mobile Sources;Off-highway Vehicle Gasoline, 2-Stroke;Construction and Mining Equipment;Signal Boards/Light Plants | < 0.01 |
| 26500320 | Internal Combustion Engines;Off-highway 4-stroke Gasoline Engines;Industrial Equipment;Industrial Fork Lift: Gasoline Engine (4-stroke) | < 0.01 |
| 20201707 | Internal Combustion Engines;Industrial;Gasoline;Reciprocating: Exhaust | < 0.01 |
| 10201701 | External Combustion Boilers;Industrial;Gasoline;Industrial Boiler | < 0.01 |

91114 – Wood Fired Boiler – Composite

The emission source profile for PM2.5 emissions from wood fired boilers is also in need of new measurements that are both representative of current technology as well as representative of all the SCCs applied to the profile. The SCCs applied to this profile are industry specific and, in some cases, wood specific (Table S22). Therefore, measurements that match these SCCs would greatly benefit the profile.

**Table S22.** SCCs currently being applied to profile # 91114 in SPECIATE (Wood Fired Boiler – Composite).

|  |  |  |
| --- | --- | --- |
| SCC | SCC Description | % of Profile Mass |
| 2102008000 | Stationary Source Fuel Combustion;Industrial;Wood;Total: All Boiler Types | 79.08 |
| 2103008000 | Stationary Source Fuel Combustion;Commercial/Institutional;Wood;Total: All Boiler Types | 5.94 |
| 10200902 | External Combustion Boilers;Industrial;Wood/Bark Waste;Wood/Bark-fired Boiler | 5.16 |
| 10201101 | External Combustion Boilers;Industrial;Bagasse;All Boiler Sizes | 2.64 |
| 10200901 | External Combustion Boilers;Industrial;Wood/Bark Waste;Bark-fired Boiler | 1.51 |
| 10200905 | External Combustion Boilers;Industrial;Wood/Bark Waste;Wood/Bark-fired Boiler (< 50,000 Lb Steam) \*\* | 0.54 |
| 10200911 | External Combustion Boilers;Industrial;Wood/Bark Waste;Stoker boilers \*\* | 0.53 |
| 10200903 | External Combustion Boilers;Industrial;Wood/Bark Waste;Wood-fired Boiler - Wet Wood (>=20% moisture) | 0.53 |
| 10100902 | External Combustion Boilers;Electric Generation;Wood/Bark Waste;Wood/Bark Fired Boiler | 0.40 |
| 10200906 | External Combustion Boilers;Industrial;Wood/Bark Waste;Wood-fired Boiler (< 50,000 Lb Steam) \*\* | 0.38 |
| 10300902 | External Combustion Boilers;Commercial/Institutional;Wood/Bark Waste;Wood/Bark-fired Boiler | 0.34 |
| 10200908 | External Combustion Boilers;Industrial;Wood/Bark Waste;Wood-fired Boiler - Dry Wood (<20% moisture) | 0.31 |
| 10100903 | External Combustion Boilers;Electric Generation;Wood/Bark Waste;Wood-fired Boiler - Wet Wood (>=20% moisture) | 0.28 |
| 10300903 | External Combustion Boilers;Commercial/Institutional;Wood/Bark Waste;Wood-fired Boiler - Wet Wood (>=20% moisture) | 0.28 |
| 10200907 | External Combustion Boilers;Industrial;Wood/Bark Waste;Wood Cogeneration | 0.26 |
| 30700606 | Industrial Processes;Pulp and Paper and Wood Products;Particleboard Manufacture;Direct Wood-fired Rotary Dryer, Southern Yellow Pine | 0.24 |
| 30701001 | Industrial Processes;Pulp and Paper and Wood Products;Oriented Strandboard (OSB) Manufacture;Direct Wood-fired Rotary Dryer, Unspecified Pines | 0.21 |
| 39000999 | Industrial Processes;In-process Fuel Use;Wood;General: Wood | 0.17 |
| 30700661 | Industrial Processes;Pulp and Paper and Wood Products;Particleboard Manufacture;Board Cooler: Urea Formaldehyde Resin | 0.15 |
| 10200912 | External Combustion Boilers;Industrial;Wood/Bark Waste;Fluidized bed combustion boiler | 0.14 |
| 10100901 | External Combustion Boilers;Electric Generation;Wood/Bark Waste;Bark-fired Boiler | 0.14 |
| 10100912 | External Combustion Boilers;Electric Generation;Wood/Bark Waste;Fluidized bed combustion boilers | 0.10 |
| 10200904 | External Combustion Boilers;Industrial;Wood/Bark Waste;Bark-fired Boiler (< 50,000 Lb Steam) \*\* | 0.09 |
| 10100911 | External Combustion Boilers;Electric Generation;Wood/Bark Waste;Stoker boilers \*\* | 0.08 |
| 39000989 | Industrial Processes;In-process Fuel Use;Wood;General | 0.07 |
| 10200910 | External Combustion Boilers;Industrial;Wood/Bark Waste;Fuel cell/Dutch oven boilers \*\* | 0.06 |
| 50300106 | Waste Disposal;Solid Waste Disposal - Industrial;Incineration;Trench Burner: Wood | 0.06 |
| 30700610 | Industrial Processes;Pulp and Paper and Wood Products;Particleboard Manufacture;Direct Wood-fired Rotary Dryer, Hardwoods | 0.05 |
| 30701010 | Industrial Processes;Pulp and Paper and Wood Products;Oriented Strandboard (OSB) Manufacture;Rotary Strand Dryer: Direct Wood-fired: Hardwood | 0.04 |
| 30700602 | Industrial Processes;Pulp and Paper and Wood Products;Particleboard Manufacture;Direct Wood-fired Rotary Dryer, Unspecified Pines, <730F Inlet Air | 0.03 |
| 30700625 | Industrial Processes;Pulp and Paper and Wood Products;Particleboard Manufacture;Direct Wood-fired Rotary Dryer, Softwood, green (:50%inlet moisture) | 0.03 |
| 10100908 | External Combustion Boilers;Electric Generation;Wood/Bark Waste;Wood-fired Boiler - Dry Wood (<20% moisture) | 0.02 |
| 10101101 | External Combustion Boilers;Electric Generation;Bagasse;All Boiler Sizes | 0.02 |
| 30700608 | Industrial Processes;Pulp and Paper and Wood Products;Particleboard Manufacture;Direct Wood-fired Rotary Dryer, mixed soft/hardwoods | 0.02 |
| 30700621 | Industrial Processes;Pulp and Paper and Wood Products;Particleboard Manufacture;Direct Wood-fired Rotary Final Dryer, Unspecified Pines | 0.02 |
| 10300911 | External Combustion Boilers;Commercial/Institutional;Wood/Bark Waste;Stoker boilers \*\* | 0.01 |
| 30700632 | Industrial Processes;Pulp and Paper and Wood Products;Particleboard Manufacture;Direct Natural Gas-fired Rotary Dryer, Hardwood | 0.01 |
| 50200201 | Waste Disposal;Solid Waste Disposal - Commercial/Institutional;Open Burning;Wood | 0.01 |
| 30701008 | Industrial Processes;Pulp and Paper and Wood Products;Oriented Strandboard (OSB) Manufacture;Direct Wood-fired Rotary Dryer, Aspen | 0.01 |
| 10300908 | External Combustion Boilers;Commercial/Institutional;Wood/Bark Waste;Wood-fired Boiler - Dry Wood (<20% moisture) | 0.01 |
| 30700607 | Industrial Processes;Pulp and Paper and Wood Products;Particleboard Manufacture;Direct Wood-fired Rotary Dryer, Softwood | 0.01 |
| 10500209 | External Combustion;Space Heaters;Commercial/Institutional;Wood | 0.01 |
| 50100510 | Waste Disposal;Solid Waste Disposal - Government;Other Incineration;Trench Burner: Wood | 0.01 |
| 10300901 | External Combustion Boilers;Commercial/Institutional;Wood/Bark Waste;Bark-fired Boiler | 0.00 |
| 10201901 | External Combustion Boilers;Industrial;Wood Residuals;Boiler, Stoker | 0.00 |
| 10300912 | External Combustion Boilers;Commercial/Institutional;Wood/Bark Waste;Fluidized bed combustion boilers | 0.00 |
| 50300105 | Waste Disposal;Solid Waste Disposal - Industrial;Incineration;Conical Design (Tee Pee) Wood Refuse | 0.00 |
| 50100604 | Waste Disposal;Solid Waste Disposal - Government;Fire Fighting;Structure: Wood Pallets | 0.00 |

91116 - Charbroiling – Composite

Although the emission source profile for charbroiling did not receive points based on specificity errors (due to measurements from the charbroiling of each meat type used to create the profile), it could be potentially improved through the creation of meat-specific charbroiling emission source profiles.

91120 – Mineral Products – Avg – Composite

The emission source profile for mineral products is an extremely general composite profile with over 300 SCCs currently being applied to the profile, ranging from metal production to mineral production (ceramic clay, brick, asphalt concrete, lime, talc). However, because the profile only accounts for 0.6% of all emissions at the national level, breaking this profile into several different emission source profiles is not a top priority.

91121 – Industrial Manufacturing – Avg – Composite

Similar to SPECIATE profile #91120, the industrial manufacturing composite profile is also an extremely general profile that is applied to a small fraction of emissions and is therefore not a top priority at this time.

91125 – Lignite Combustion – Composite

The lignite combustion emission source profile needs new data measurements representing the SCCs listed in Table S23.

**Table S23.** SCCs currently being applied to profile #91125 in SPECIATE (Lignite Combustion– Composite).

|  |  |  |
| --- | --- | --- |
| SCC | SCC Description | % of Profile Mass |
| 10100302 | External Combustion Boilers;Electric Generation;Pulverized Lignite;Boiler, Dry Bottom Tangential-fired | 69.08 |
| 10100301 | External Combustion Boilers;Electric Generation;Pulverized Lignite;Boiler, Dry Bottom Wall-fired | 19.08 |
| 10100303 | External Combustion Boilers;Electric Generation;Lignite;Cyclone Furnace | 9.06 |
| 10100317 | External Combustion Boilers;Electric Generation;Lignite;Boiler, Atmospheric Fluidized Bed Combustion - Bubbling Bed | 2.58 |
| 10100306 | External Combustion Boilers;Electric Generation;Lignite;Boiler, Spreader Stoker | 0.12 |
| 10200306 | External Combustion Boilers;Industrial;Lignite;Spreader Stoker | 0.08 |
| 10200303 | External Combustion Boilers;Industrial;Lignite;Cyclone Furnace | < 0.01 |
| 10200307 | External Combustion Boilers;Industrial;Lignite;Cogeneration | < 0.01 |
| 10300306 | External Combustion Boilers;Commercial/Institutional;Lignite;Pulverized Coal: Dry Bottom, Tangential Fired | < 0.01 |

91145 – Petroleum Industry – Avg – Composite

The petroleum industry composite profile is also an extremely general profile that represents less than 1% of the total US emissions and therefore is not a top priority at this time.

*S4.2 VOC Emission Source Profile Needs*

0000 – Overall Average

The overall average emission source profile is the profile that is used for those SCCs that do not have an appropriate emission source profile to be mapped against. Therefore, this profile has a significant specificity issue and should be broken up into several new or existing emission source profiles for the different source categories, such as external combustion boilers, internal combustion engines, chemical manufacturing, food and agricultural industrial processes, metal production, mineral products, petroleum industry, pulp and paper, transportation, photographic film manufacturing, textiles, leather products, chemical evaporation and waste disposal. The top 80% of the emission source profiles applied are listed in Table S12.

0121 - Open Burning Dump - Landscape/Pruning

The emission source profile for open burning dump/landscape pruning needs new data as well as an update in specificity. In the current emissions modeling platform, the SCCs for the open burning of household waste and the open burning of general refuse are mapped to the emission source profile for the open burning of landscape/pruning. Therefore, a new emission source profile for the open burning of household waste would help improve the modeling platform.

1001 – Internal Combustion Engine – Natural Gas

The internal combustion engine for natural gas emission source profile is both in need of new measurements based on the SCCs applied to the profile (Table S24) as well as an update on specificity, as there is a wide range of profiles assigned to the emission source category.

**Table S24.** SCCs currently being applied to profile # 1001 in SPECIATE (Internal Combustion Engine – Natural Gas).

|  |  |  |
| --- | --- | --- |
| **SCC** | **SCC Description** | **% of Profile Mass** |
| 20200254 | Internal Combustion Engines;Industrial;Natural Gas;4-cycle Lean Burn | 26.82 |
| 20200253 | Internal Combustion Engines;Industrial;Natural Gas;4-cycle Rich Burn | 14.50 |
| 20200252 | Internal Combustion Engines;Industrial;Natural Gas;2-cycle Lean Burn | 10.52 |
| 20200202 | Internal Combustion Engines;Industrial;Natural Gas;Reciprocating | 9.49 |
| 2310000330 | Industrial Processes;Oil and Gas Exploration and Production;All Processes;Artificial Lift | 7.37 |
| 2310021302 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production;Natural Gas Fired 4Cycle Rich Burn Compressor Engines 50 To 499 HP | 5.44 |
| 2310021202 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production;Natural Gas Fired 4Cycle Lean Burn Compressor Engines 50 To 499 HP | 5.20 |
| 20100802 | Internal Combustion Engines;Electric Generation;Landfill Gas;Reciprocating | 2.73 |
| 2310020600 | Industrial Processes;Oil and Gas Exploration and Production;Natural Gas;Compressor Engines | 2.69 |
| 2310021203 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production;Natural Gas Fired 4Cycle Lean Burn Compressor Engines 500+ HP | 1.85 |
| 2310021102 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production;Natural Gas Fired 2Cycle Lean Burn Compressor Engines 50 To 499 HP | 1.83 |
| 20300201 | Internal Combustion Engines;Commercial/Institutional;Natural Gas;Reciprocating | 1.78 |
| 2310021251 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production;Lateral Compressors 4 Cycle Lean Burn | 1.41 |
| 2310021351 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production;Lateral Compressors 4 Cycle Rich Burn | 1.19 |
| 31000203 | Industrial Processes;Oil and Gas Production;Natural Gas Production;Compressors (See also 310003-12 and -13) | 1.15 |
| 2310023202 | Industrial Processes;Oil and Gas Exploration and Production;Coal Bed Methane Natural Gas;CBM Fired 4Cycle Lean Burn Compressor Engines 50 To 499 HP | 0.92 |
| 2310021403 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production;Nat Gas Fired 4Cycle Rich Burn Compressor Engines 500+ HP w/NSCR | 0.84 |
| 20100202 | Internal Combustion Engines;Electric Generation;Natural Gas;Reciprocating | 0.82 |
| 2310023302 | Industrial Processes;Oil and Gas Exploration and Production;Coal Bed Methane Natural Gas;CBM Fired 4Cycle Rich Burn Compressor Engines 50 To 499 HP | 0.48 |
| 20200256 | Internal Combustion Engines;Industrial;Natural Gas;4-cycle Clean Burn | 0.43 |
| 20300702 | Internal Combustion Engines;Commercial/Institutional;Digester Gas;Reciprocating: POTW Digester Gas | 0.29 |
| 20200255 | Internal Combustion Engines;Industrial;Natural Gas;2-cycle Clean Burn | 0.27 |
| 20300802 | Internal Combustion Engines;Commercial/Institutional;Landfill Gas;Reciprocating | 0.24 |
| 28888801 | Internal Combustion Engines;Fugitive Emissions;Other Not Classified;Specify in Comments | 0.24 |
| 2310023251 | Industrial Processes;Oil and Gas Exploration and Production;Coal Bed Methane Natural Gas;Lateral Compressors 4 Cycle Lean Burn | 0.21 |
| 2310023351 | Industrial Processes;Oil and Gas Exploration and Production;Coal Bed Methane Natural Gas;Lateral Compressors 4 Cycle Rich Burn | 0.14 |
| 20201702 | Internal Combustion Engines;Industrial;Gasoline;Reciprocating Engine | 0.14 |
| 20280001 | Internal Combustion Engines;Industrial;Equipment Leaks;Equipment Leaks | 0.12 |
| 20100807 | Internal Combustion Engines;Electric Generation;Landfill Gas;Reciprocating: Exhaust | 0.11 |
| 20100206 | Internal Combustion Engines;Electric Generation;Natural Gas;Reciprocating: Evaporative Losses (Fuel Delivery System) | 0.09 |
| 20300204 | Internal Combustion Engines;Commercial/Institutional;Natural Gas;Reciprocating: Cogeneration | 0.09 |
| 20200204 | Internal Combustion Engines;Industrial;Natural Gas;Reciprocating: Cogeneration | 0.08 |
| 2310021402 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production;Nat Gas Fired 4Cycle Rich Burn Compressor Engines 50 To 499 HP w/NSCR | 0.06 |
| 20200207 | Internal Combustion Engines;Industrial;Natural Gas;Reciprocating: Exhaust | 0.06 |
| 20100702 | Internal Combustion Engines;Electric Generation;Process Gas;Reciprocating | 0.06 |
| 20200702 | Internal Combustion Engines;Industrial;Process Gas;Reciprocating Engine | 0.05 |
| 2310021101 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production;Natural Gas Fired 2Cycle Lean Burn Compressor Engines < 50 HP | 0.05 |
| 20201001 | Internal Combustion Engines;Industrial;Liquified Petroleum Gas (LPG);Propane: Reciprocating | 0.03 |
| 20380001 | Internal Combustion Engines;Commercial/Institutional;Equipment Leaks;Equipment Leaks | 0.03 |
| 20201607 | Internal Combustion Engines;Industrial;Methanol;Reciprocating: Exhaust | 0.03 |
| 20400404 | Internal Combustion Engines;Engine Testing;Reciprocating Engine;Process Gas | 0.02 |
| 20100207 | Internal Combustion Engines;Electric Generation;Natural Gas;Reciprocating: Exhaust | 0.02 |
| 20100707 | Internal Combustion Engines;Electric Generation;Process Gas;Reciprocating: Exhaust | 0.01 |
| 2310021103 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production;Natural Gas Fired 2Cycle Lean Burn Compressor Engines 500+ HP | 0.01 |
| 2310021301 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production;Natural Gas Fired 4Cycle Rich Burn Compressor Engines <50 HP | 0.01 |
| 20301001 | Internal Combustion Engines;Commercial/Institutional;Liquified Petroleum Gas (LPG);Propane: Reciprocating | 0.01 |
| 20180001 | Internal Combustion Engines;Electric Generation;Equipment Leaks;Equipment Leaks | 0.01 |
| 20201707 | Internal Combustion Engines;Industrial;Gasoline;Reciprocating: Exhaust | 0.01 |
| 20200205 | Internal Combustion Engines;Industrial;Natural Gas;Reciprocating: Crankcase Blowby | < 0.01 |
| 2310021303 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production;Natural Gas Fired 4Cycle Rich Burn Compressor Engines 500+ HP | < 0.01 |
| 20300207 | Internal Combustion Engines;Commercial/Institutional;Natural Gas;Reciprocating: Exhaust | < 0.01 |
| 40201004 | Chemical Evaporation;Surface Coating Operations;Coating Oven Heater;Liquified Petroleum Gas (LPG) | < 0.01 |
| 20201602 | Internal Combustion Engines;Industrial;Methanol;Reciprocating Engine | < 0.01 |
| 2310021201 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production;Natural Gas Fired 4Cycle Lean Burn Compressor Engines <50 HP | < 0.01 |
| 20300205 | Internal Combustion Engines;Commercial/Institutional;Natural Gas;Reciprocating: Crankcase Blowby | < 0.01 |
| 20300705 | Internal Combustion Engines;Commercial/Institutional;Digester Gas;Reciprocating: Crankcase Blowby | < 0.01 |
| 20300706 | Internal Combustion Engines;Commercial/Institutional;Digester Gas;Reciprocating: Evaporative Losses (Fuel Storage and Delivery System) | < 0.01 |
| 20201002 | Internal Combustion Engines;Industrial;Liquified Petroleum Gas (LPG);Butane: Reciprocating | < 0.01 |
| 2310023102 | Industrial Processes;Oil and Gas Exploration and Production;Coal Bed Methane Natural Gas;CBM Fired 2Cycle Lean Burn Compressor Engines 50 To 499 HP | < 0.01 |
| 20201013 | Internal Combustion Engines;Industrial;Liquified Petroleum Gas (LPG);Turbine: Cogeneration | < 0.01 |
| 20201012 | Internal Combustion Engines;Industrial;Liquified Petroleum Gas (LPG);Reciprocating Engine | < 0.01 |
| 20201706 | Internal Combustion Engines;Industrial;Gasoline;Reciprocating: Evaporative Losses (Fuel Storage and Delivery System) | < 0.01 |
| 20201011 | Internal Combustion Engines;Industrial;Liquified Petroleum Gas (LPG);Turbine | < 0.01 |
| 20100805 | Internal Combustion Engines;Electric Generation;Landfill Gas;Reciprocating: Crankcase Blowby | < 0.01 |
| 20201701 | Internal Combustion Engines;Industrial;Gasoline;Turbine | < 0.01 |
| 20201007 | Internal Combustion Engines;Industrial;Liquified Petroleum Gas (LPG);Reciprocating: Exhaust | < 0.01 |
| 2310021401 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production;Nat Gas Fired 4Cycle Rich Burn Compressor Engines <50 HP w/NSCR | < 0.01 |

1007 - Mineral Products - Asphaltic Concrete

No recommendations at this time.

1011 - Oil and Gas Production - Fugitives - Valves and Fittings - Liquid Service

This emission source profile is in need of data that is representative of regional variability in oil and gas composition. Data from the South and from the Northern Rockies and Plains would be most useful.

1188 - Fermentation Processes

The fermentation processes emission source profile is in need of an update based on specificity due to the various alcohol types and industries/process specific SCCs applied. This profile could improve with new measurements based on alcohol type as well as process type. The specific processes and alcohols represented by the SCCs are listed in Table S25.

**Table S25.** SCCs currently being applied to profile # 1188 in SPECIATE (Fermentation Processes).

|  |  |  |
| --- | --- | --- |
| SCC | SCC Description | % of Profile Mass |
| 30201003 | Industrial Processes;Food and Agriculture;Distilled Spirits;Aging\*\* (see 3-02-010-17) | 29.20 |
| 30201011 | Industrial Processes;Food and Agriculture;Distilled Spirits;Fugitive Emissions: General | 15.89 |
| 2302050000 | Industrial Processes;Food and Kindred Products: SIC 20;Bakery Products;Total | 14.34 |
| 2302070005 | Industrial Processes;Food and Kindred Products: SIC 20;Fermentation/Beverages;Wineries | 7.56 |
| 30201017 | Industrial Processes;Food and Agriculture;Distilled Spirits;Whiskey: Aging - Evaporation Loss | 5.31 |
| 30201103 | Industrial Processes;Food and Agriculture;Wines, Brandy, and Brandy Spirits;Aging | 4.51 |
| 30125010 | Industrial Processes;Chemical Manufacturing;Methanol/Alcohol Production;Ethanol by Fermentation | 4.12 |
| 30201010 | Industrial Processes;Food and Agriculture;Distilled Spirits;Whiskey Bottling: Storage\*\* (see 3-02-010-18) | 2.28 |
| 30200902 | Industrial Processes;Food and Agriculture;Beer Production;Drying Spent Grains \*\* (use SCCs 3-02-009-30 & -31) | 2.17 |
| 30205011 | Industrial Processes;Food and Agriculture;Ethanol Production;Fermentation | 2.04 |
| 30201099 | Industrial Processes;Food and Agriculture;Distilled Spirits;Other Not Classified \*\* | 1.40 |
| 30200998 | Industrial Processes;Food and Agriculture;Beer Production;Other Not Classified | 1.32 |
| 2302070001 | Industrial Processes;Food and Kindred Products: SIC 20;Fermentation/Beverages;Breweries | 1.30 |
| 30201004 | Industrial Processes;Food and Agriculture;Distilled Spirits;Fermentation Tank\*\* (see 3-02-010-14) | 1.00 |
| 30201106 | Industrial Processes;Food and Agriculture;Wines, Brandy, and Brandy Spirits;Wine Fermentation - Red Wine | 0.83 |
| 30125099 | Industrial Processes;Chemical Manufacturing;Methanol/Alcohol Production;Other Not Classified | 0.76 |
| 30201105 | Industrial Processes;Food and Agriculture;Wines, Brandy, and Brandy Spirits;Wine Fermentation - White Wine | 0.76 |
| 30201110 | Industrial Processes;Food and Agriculture;Wines, Brandy, and Brandy Spirits;Wine Bottling: Storage | 0.66 |
| 30201002 | Industrial Processes;Food and Agriculture;Distilled Spirits;Dryer House Operations | 0.59 |
| 30205091 | Industrial Processes;Food and Agriculture;Ethanol Production;Equipment Leaks | 0.47 |
| 30205014 | Industrial Processes;Food and Agriculture;Ethanol Production;DDGS Cooling | 0.46 |
| 30205021 | Industrial Processes;Food and Agriculture;Ethanol Production;Natural Gas Combustion from Thermal Oxidizer | 0.32 |
| 2302070000 | Industrial Processes;Food and Kindred Products: SIC 20;Fermentation/Beverages;Total | 0.32 |
| 30201014 | Industrial Processes;Food and Agriculture;Distilled Spirits;Whiskey: Fermentation Tank | 0.31 |
| 30205010 | Industrial Processes;Food and Agriculture;Ethanol Production;Distillation | 0.28 |
| 30205012 | Industrial Processes;Food and Agriculture;Ethanol Production;Stillage Drying (Dry Mill Process) | 0.25 |
| 30205053 | Industrial Processes;Food and Agriculture;Ethanol Production;Ethanol Loadout to Railcar | 0.24 |
| 30201199 | Industrial Processes;Food and Agriculture;Wines, Brandy, and Brandy Spirits;Other Not Classified | 0.18 |
| 30201104 | Industrial Processes;Food and Agriculture;Wines, Brandy, and Brandy Spirits;Fermentation Tank | 0.17 |
| 30205052 | Industrial Processes;Food and Agriculture;Ethanol Production;Ethanol Loadout to Truck | 0.15 |
| 30201018 | Industrial Processes;Food and Agriculture;Distilled Spirits;Whiskey: Blending/Bottling | 0.14 |
| 2302080000 | Industrial Processes;Food and Kindred Products: SIC 20;Miscellaneous Food and Kindred Products;Total | 0.10 |
| 30205020 | Industrial Processes;Food and Agriculture;Ethanol Production;Natural Gas Combustion from Dryer | 0.09 |
| 30205038 | Industrial Processes;Food and Agriculture;Ethanol Production;190 Proof Ethanol Storage Standing Loss | 0.07 |
| 30125020 | Industrial Processes;Chemical Manufacturing;Methanol/Alcohol Production;Alcohols by Oxo Process | 0.07 |
| 30205041 | Industrial Processes;Food and Agriculture;Ethanol Production;Vapor Recovery (From Ethanol Loadout) Combustion | 0.05 |
| 30201015 | Industrial Processes;Food and Agriculture;Distilled Spirits;Whiskey: Distillation | 0.05 |
| 30205030 | Industrial Processes;Food and Agriculture;Ethanol Production;Denatured Ethanol Storage Standing Loss | 0.05 |
| 2302070010 | Industrial Processes;Food and Kindred Products: SIC 20;Fermentation/Beverages;Distilleries | 0.03 |
| 30205035 | Industrial Processes;Food and Agriculture;Ethanol Production;200 Proof Ethanol Storage Working Loss | 0.03 |
| 30205039 | Industrial Processes;Food and Agriculture;Ethanol Production;190 Proof Ethanol Storage Working Loss | 0.03 |
| 30206013 | Industrial Processes;Food and Agriculture;Biodiesel Production;Biodiesel Process Vents | 0.03 |
| 30125025 | Industrial Processes;Chemical Manufacturing;Methanol/Alcohol Production;Fatty Alcohols by Hydrogenation | 0.02 |
| 30205031 | Industrial Processes;Food and Agriculture;Ethanol Production;Denatured Ethanol Storage Working Loss | 0.02 |
| 30205034 | Industrial Processes;Food and Agriculture;Ethanol Production;200 Proof Ethanol Storage Standing Loss | 0.02 |
| 30205040 | Industrial Processes;Food and Agriculture;Ethanol Production;Biomethanator Flaring | 0.02 |
| 30205013 | Industrial Processes;Food and Agriculture;Ethanol Production;Stillage Drying (Wet Mill Process) | 0.01 |
| 30200940 | Industrial Processes;Food and Agriculture;Beer Production;Brewers Yeast Disposal | 0.01 |
| 30205050 | Industrial Processes;Food and Agriculture;Ethanol Production;DDGS Loadout to Trucks | 0.01 |
| 30200937 | Industrial Processes;Food and Agriculture;Beer Production;Fermenter Venting: Open Fermenter | < 0.01 |
| 30205032 | Industrial Processes;Food and Agriculture;Ethanol Production;E-85 Denatured Ethanol Storage Standing Loss | < 0.01 |
| 30205033 | Industrial Processes;Food and Agriculture;Ethanol Production;E-85 Denatured Ethanol Storage Working Loss | < 0.01 |
| 30205051 | Industrial Processes;Food and Agriculture;Ethanol Production;DDGS Loadout to Railcars | < 0.01 |

1191 - Graphic Arts - Printing

This emission source category needs new data that is representative of emissions from current ink compositions used in the graphic arts – printing industry.

2487 - Composite of 7 Emission Profiles from Crude Oil Storage Tanks – 1993

The source profile for emissions from crude oil storage tanks is in need of an update based on specificity. Measurements are needed for crude oil stored in the following regions: Northeast, Southeast, Southwest, West and in the Northern Rockies and Plains. Table S26 shows the SCCs mapped to the emission source profile.

**Table S26.** SCCs currently being applied to profile # 2487 in SPECIATE (Composite of 7 Emission Profiles from Crude Oil Storage Tanks – 1993).

|  |  |  |
| --- | --- | --- |
| SCC | SCC Description | % of Profile Mass |
| 2310010200 | Industrial Processes;Oil and Gas Exploration and Production;Crude Petroleum;Oil Well Tanks - Flashing & Standing/Working/Breathing | 52.87 |
| 2310011020 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Oil Production;Storage Tanks: Crude Oil | 29.77 |
| 2310021010 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production;Storage Tanks: Condensate | 11.72 |
| 2310011201 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Oil Production;Tank Truck/Railcar Loading: Crude Oil | 4.63 |
| 2310021030 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production;Tank Truck/Railcar Loading: Condensate | 0.23 |
| 2310421010 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production - Unconventional;Storage Tanks: Condensate | 0.18 |
| 2310321010 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production - Conventional;Storage Tanks: Condensate | 0.17 |
| 2310023010 | Industrial Processes;Oil and Gas Exploration and Production;Coal Bed Methane Natural Gas;Storage Tanks: Condensate | 0.13 |
| 40301109 | Chemical Evaporation;Petroleum Product Storage at Refineries;Floating Roof Tanks (Varying Sizes);Crude Oil RVP 5: Breathing Loss (67000 Bbl. Tank Size) | 0.05 |
| 40301117 | Chemical Evaporation;Petroleum Product Storage at Refineries;Floating Roof Tanks (Varying Sizes);Crude Oil RVP 5: Working Loss | 0.05 |
| 40301110 | Chemical Evaporation;Petroleum Product Storage at Refineries;Floating Roof Tanks (Varying Sizes);Crude Oil RVP 5: Breathing Loss (250000 Bbl. Tank Size) | 0.04 |
| 40301132 | Chemical Evaporation;Petroleum Product Storage at Refineries;Floating Roof Tanks (Varying Sizes);Crude Oil: Breathing Loss - External - Primary Seal | 0.03 |
| 40301142 | Chemical Evaporation;Petroleum Product Storage at Refineries;Floating Roof Tanks (Varying Sizes);Crude Oil: Breathing Loss - External - Secondary Seal | 0.03 |
| 40301012 | Chemical Evaporation;Petroleum Product Storage at Refineries;Fixed Roof Tanks (Varying Sizes);Crude Oil RVP 5: Working Loss (Tank Diameter Independent) | 0.03 |
| 40301010 | Chemical Evaporation;Petroleum Product Storage at Refineries;Fixed Roof Tanks (Varying Sizes);Crude Oil RVP 5: Breathing Loss (67000 Bbl. Tank Size) | 0.02 |
| 40301152 | Chemical Evaporation;Petroleum Product Storage at Refineries;Floating Roof Tanks (Varying Sizes);Crude Oil: Breathing Loss - Internal | 0.01 |
| 2310020800 | Industrial Processes;Oil and Gas Exploration and Production;Natural Gas;Gas Well Truck Loading | 0.01 |
| 40301011 | Chemical Evaporation;Petroleum Product Storage at Refineries;Fixed Roof Tanks (Varying Sizes);Crude Oil RVP 5: Breathing Loss (250000 Bbl. Tank Size) | 0.01 |
| 2310023030 | Industrial Processes;Oil and Gas Exploration and Production;Coal Bed Methane Natural Gas;Tank Truck/Railcar Loading: Condensate | < 0.01 |
| 20100108 | Internal Combustion Engines;Electric Generation;Distillate Oil (Diesel);Turbine: Evaporative Losses (Fuel Storage and Delivery System) | < 0.01 |
| 31000132 | Industrial Processes;Oil and Gas Production;Crude Oil Production;Atmospheric Wash Tank (2nd Stage of Gas-Oil Separation): Flashing Loss | < 0.01 |
| 31000133 | Industrial Processes;Oil and Gas Production;Crude Oil Production;Storage Tank | < 0.01 |
| 30206011 | Industrial Processes;Food and Agriculture;Biodiesel Production;Crude Oil Tank | < 0.01 |
| 2310030401 | Industrial Processes;Oil and Gas Exploration and Production;Natural Gas Liquids;Gas Plant Truck Loading | < 0.01 |
| 40600171 | Chemical Evaporation;Transportation and Marketing of Petroleum Products;Tank Cars and Trucks;Distillate Oil: Loaded with Vapor (Transit Losses) | < 0.01 |
| 2310022010 | Industrial Processes;Oil and Gas Exploration and Production;Off-Shore Gas Production;Storage Tanks: Condensate | < 0.01 |
| 20200506 | Internal Combustion Engines;Industrial;Residual/Crude Oil;Reciprocating: Evaporative Losses (Fuel Storage and Delivery System) | < 0.01 |

3001 – Pesticides

There are two recommendations for the pesticides emission source profile updates: measurements representative of current products and, preferably, measurements of products from outside California, due to their stricter regulations and potentially different product composition.

3142-3147 – Consumer Products

Similar to the recommendations for the pesticides emission source profile, there are also two recommendations for the consumer products emission source profiles: measurements representative of current products and, preferably, measurements from products from outside California, due to their stricter regulations and potentially different product composition.

4553 - Meat charbroiling

No recommendations at this time.

4642 - Fireplace wood combustion - pine wood

The emission source profile for fireplace wood combustion, specific to pine wood, is in need of new data using combustors that are representative of stoves and fireplaces in current-use as well as a potential update in specificity. The SCCs applied to this emission source profile (Table S26) are specific to combustor type. Therefore, new data based on each type of combustor would be beneficial.

**Table S26.** SCCs currently being applied to profile # 4642 in SPECIATE (Fireplace wood combustion - pine wood).

|  |  |  |
| --- | --- | --- |
| SCC | SCC Description | % of Profile Mass |
| 2104008310 | Stationary Source Fuel Combustion;Residential;Wood;Woodstove: freestanding, non-EPA certified | 35.71 |
| 2104008610 | Stationary Source Fuel Combustion;Residential;Wood;Hydronic heater: outdoor | 24.98 |
| 2104008320 | Stationary Source Fuel Combustion;Residential;Wood;Woodstove: freestanding, EPA certified, non-catalytic | 8.78 |
| 2104008210 | Stationary Source Fuel Combustion;Residential;Wood;Woodstove: fireplace inserts; non-EPA certified | 8.29 |
| 2104008100 | Stationary Source Fuel Combustion;Residential;Wood;Fireplace: general | 7.91 |
| 2104008700 | Stationary Source Fuel Combustion;Residential;Wood;Outdoor wood burning device, NEC (fire-pits, chimeas, etc) | 5.00 |
| 2104009000 | Stationary Source Fuel Combustion;Residential;Firelog;Total: All Combustor Types | 3.31 |
| 2104008510 | Stationary Source Fuel Combustion;Residential;Wood;Furnace: Indoor, cordwood-fired, non-EPA certified | 2.62 |
| 2102008000 | Stationary Source Fuel Combustion;Industrial;Wood;Total: All Boiler Types | 1.40 |
| 2104008220 | Stationary Source Fuel Combustion;Residential;Wood;Woodstove: fireplace inserts; EPA certified; non-catalytic | 1.21 |
| 2104008400 | Stationary Source Fuel Combustion;Residential;Wood;Woodstove: pellet-fired, general (freestanding or FP insert) | 0.52 |
| 39000999 | Industrial Processes;In-process Fuel Use;Wood;General: Wood | 0.15 |
| 2103008000 | Stationary Source Fuel Combustion;Commercial/Institutional;Wood;Total: All Boiler Types | 0.11 |
| 50300106 | Waste Disposal;Solid Waste Disposal - Industrial;Incineration;Trench Burner: Wood | < 0.01 |
| 10300908 | External Combustion Boilers;Commercial/Institutional;Wood/Bark Waste;Wood-fired Boiler - Dry Wood (<20% moisture) | < 0.01 |
| 30500318 | Industrial Processes;Mineral Products;Brick Manufacture;Tunnel Kiln: Wood-fired | < 0.01 |

8520 - Consumer and Commercial Products: Automotive Aftermarket Products: All Automotive Aftermarket Products

This emission source profile needs new measurements based on current products.

8744 - Composite Profile - Architectural Coatings: Solvent Borne and water borne

This emission source profile needs new measurements based on current products, preferably from products from outside of California.

8745 - Composite Profile - Degreasing: Cold Cleaning - Batch, Conveyor, Spray Gun

This emission source profile needs new measurements based on current products, preferably from products from outside of California.

8746 - Composite Profile - Straw Burning

This emission source profile has a specificity issue because it is applied to a wide range of SCCs, including the combustion of wheat straw, rice straw, alfalfa, asparagus, red beans, corn, soybeans, cotton, grasses, fallow, hay, peas, sugar cane, apples, apricots, cherries, nectarines, olives, peaches, pears, prunes, and unspecified vine crops. A potential update could include the creation of several source categories for similar crop type.

8869/8870 - Gasoline Headspace Vapor

No recommendations at this time.

8949 - Natural Gas Production

The natural gas production emission source would benefit from improved specificity. Based on the SCCs applied to the profile (Table S27), a potential recommendation is that it be split into several different natural gas production source profiles for categories such as gas exploration, well completion and natural gas processing.

**Table S27.** SCCs currently being applied to profile # 8949 in SPECIATE (Natural Gas Production).

|  |  |  |
| --- | --- | --- |
| SCC | SCC Description | % of Profile Mass |
| 2310010300 | Industrial Processes;Oil and Gas Exploration and Production;Crude Petroleum;Oil Well Pneumatic Devices | 29.16 |
| 2310121401 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Exploration;Gas Well Pneumatic Pumps | 14.88 |
| 2310021300 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production;Gas Well Pneumatic Devices | 14.25 |
| 2310021505 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production;Fugitives: Valves | 6.71 |
| 2310021400 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production;Gas Well Dehydrators | 5.20 |
| 2310021506 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production;Fugitives: Other | 5.03 |
| 2310021509 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production;Fugitives: All Processes | 4.46 |
| 2310021603 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production;Gas Well Venting - Blowdowns | 4.21 |
| 2310321603 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production - Conventional;Gas Well Venting - Blowdowns | 3.79 |
| 2310121700 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Exploration;Gas Well Completion: All Processes | 3.22 |
| 2310021501 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production;Fugitives: Connectors | 1.77 |
| 2310121100 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Exploration;Mud Degassing | 1.45 |
| 31000220 | Industrial Processes;Oil and Gas Production;Natural Gas Production;All Equipt Leak Fugitives (Valves, Flanges, Connections, Seals, Drains | 1.06 |
| 2310021600 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production;Gas Well Venting | 0.78 |
| 2310021503 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production;Fugitives: Open Ended Lines | 0.77 |
| 2310021502 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production;Fugitives: Flanges | 0.45 |
| 31000299 | Industrial Processes;Oil and Gas Production;Natural Gas Production;Other Not Classified | 0.40 |
| 31000227 | Industrial Processes;Oil and Gas Production;Natural Gas Production;Glycol Dehydrator Reboiler Still Stack | 0.37 |
| 31000207 | Industrial Processes;Oil and Gas Production;Natural Gas Production;Valves: Fugitive Emissions | 0.32 |
| 31000301 | Industrial Processes;Oil and Gas Production;Natural Gas Processing;Glycol Dehydrator Reboiler Still Stack | 0.29 |
| 2310021504 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production;Fugitives: Pumps | 0.27 |
| 2310020000 | Industrial Processes;Oil and Gas Exploration and Production;Natural Gas;Total: All Processes | 0.24 |
| 2310022000 | Industrial Processes;Oil and Gas Exploration and Production;Off-Shore Gas Production;Total: All Processes | 0.24 |
| 31000305 | Industrial Processes;Oil and Gas Production;Natural Gas Processing;Amine Process | 0.11 |
| 2310321400 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production - Conventional;Gas Well Dehydrators | 0.10 |
| 31000304 | Industrial Processes;Oil and Gas Production;Natural Gas Processing;Glycol Dehydrator (See also 31000301-31000303) | 0.07 |
| 2310421400 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production - Unconventional;Gas Well Dehydrators | 0.07 |
| 2310421603 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production - Unconventional;Gas Well Venting - Blowdowns | 0.04 |
| 31000321 | Industrial Processes;Oil and Gas Production;Natural Gas Processing;Glycol Dehydrators: Niagaran Formation (Mich.) | 0.03 |
| 31000201 | Industrial Processes;Oil and Gas Production;Natural Gas Production;Amine Process | 0.03 |
| 31000223 | Industrial Processes;Oil and Gas Production;Natural Gas Production;Relief Valves | 0.02 |
| 31000325 | Industrial Processes;Oil and Gas Production;Natural Gas Processing;Pneumatic Controllers, High Bleed >6 scfh | 0.02 |
| 31000306 | Industrial Processes;Oil and Gas Production;Natural Gas Processing;Process Valves | 0.02 |
| 2310000000 | Industrial Processes;Oil and Gas Exploration and Production;All Processes;Total: All Processes | 0.02 |
| 31000309 | Industrial Processes;Oil and Gas Production;Natural Gas Processing;Compressor Seals | 0.02 |
| 31000211 | Industrial Processes;Oil and Gas Production;Natural Gas Production;Pipeline Pigging (releases during pig removal) | 0.01 |
| 31000311 | Industrial Processes;Oil and Gas Production;Natural Gas Processing;Flanges and Connections | 0.01 |
| 31000202 | Industrial Processes;Oil and Gas Production;Natural Gas Production;Gas Stripping Operations | 0.01 |
| 31000303 | Industrial Processes;Oil and Gas Production;Natural Gas Processing;Glycol Dehydrator Separator Vent | 0.01 |
| 2310020700 | Industrial Processes;Oil and Gas Exploration and Production;Natural Gas;Gas Well Fugitives | 0.01 |
| 31000307 | Industrial Processes;Oil and Gas Production;Natural Gas Processing;Relief Valves | 0.01 |
| 31000230 | Industrial Processes;Oil and Gas Production;Natural Gas Production;Hydrocarbon Skimmer | 0.01 |
| 2310021310 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production;Gas Well Pneumatic Pumps | 0.01 |
| 31000322 | Industrial Processes;Oil and Gas Production;Natural Gas Processing;Glycol Dehydrators: Prairie du Chien Formation (Mich.) | < 0.01 |
| 31000310 | Industrial Processes;Oil and Gas Production;Natural Gas Processing;Pump Seals | < 0.01 |
| 31000226 | Industrial Processes;Oil and Gas Production;Natural Gas Production;Flanges and Connections | < 0.01 |
| 31000231 | Industrial Processes;Oil and Gas Production;Natural Gas Production;Fugitives: Drains | < 0.01 |
| 31000324 | Industrial Processes;Oil and Gas Production;Natural Gas Processing;Pneumatic Controllers Low Bleed | < 0.01 |
| 31000225 | Industrial Processes;Oil and Gas Production;Natural Gas Production;Compressor Seals | < 0.01 |
| 2310002421 | Industrial Processes;Oil and Gas Exploration and Production;Off-Shore Oil And Gas Production;Cold Vents | < 0.01 |
| 2310021601 | Industrial Processes;Oil and Gas Exploration and Production;On-Shore Gas Production;Gas Well Venting - Initial Completions | < 0.01 |
| 31000323 | Industrial Processes;Oil and Gas Production;Natural Gas Processing;Glycol Dehydrators: Antrim Formation (Mich.) | < 0.01 |
| 31000224 | Industrial Processes;Oil and Gas Production;Natural Gas Production;Pump Seals | < 0.01 |
| 31000206 | Industrial Processes;Oil and Gas Production;Natural Gas Production;Gas Lift | < 0.01 |
| 2310022420 | Industrial Processes;Oil and Gas Exploration and Production;Off-Shore Gas Production;Dehydrator | < 0.01 |
| 31000204 | Industrial Processes;Oil and Gas Production;Natural Gas Production;Wells | < 0.01 |
| 31000222 | Industrial Processes;Oil and Gas Production;Natural Gas Production;Well Completions | < 0.01 |
| 31000221 | Industrial Processes;Oil and Gas Production;Natural Gas Production;Site Preparation | < 0.01 |
| 31000229 | Industrial Processes;Oil and Gas Production;Natural Gas Production;Gathering Lines | < 0.01 |
| 2310002000 | Industrial Processes;Oil and Gas Exploration and Production;Off-Shore Oil And Gas Production;Total: All Processes | < 0.01 |
| 2310002401 | Industrial Processes;Oil and Gas Exploration and Production;Off-Shore Oil And Gas Production;Pneumatic Pumps: Gas And Oil Wells | < 0.01 |
| 31000208 | Industrial Processes;Oil and Gas Production;Natural Gas Production;Sulfur Recovery Unit | < 0.01 |
| 2310002411 | Industrial Processes;Oil and Gas Exploration and Production;Off-Shore Oil And Gas Production;Pressure/Level Controllers | < 0.01 |
| 2310122100 | Industrial Processes;Oil and Gas Exploration and Production;Off-Shore Gas Exploration;Mud Degassing | < 0.01 |
| 2310022410 | Industrial Processes;Oil and Gas Exploration and Production;Off-Shore Gas Production;Amine Unit | < 0.01 |

95240 - Beef Cattle Farm and Animal Waste

New data are needed for this profile. Measurements from beef and dairy cattle farms as well as waste emission data for horses/ponies and sheep/lambs.

95398 - Composite Profile - Oil and Natural Gas Production - Condensate Tanks

No recommendations at this time.

95417 - Oil and Gas Production - Composite Profile - Untreated Natural Gas, Uinta Basin

No recommendations at this time.

95419 - Oil and Gas Production - Composite Profile - Oil Tank Vent Gas, Uinta Basin

No recommendations at this time.

95420 - Oil and Gas Production - Composite Profile - Glycol Dehydrator, Uinta Basin

No recommendations at this time.

95421-95425 - Composite Profiles for various prescribed and wildfire types

The recommendations for these profiles is to conduct separate emission source testing for flaming and smoldering phases of the fire.

95087a - Oil and Gas - Composite - Oil Field - Oil Tank Battery Vent Gas

No recommendations at this time.

95109a - Oil and Gas - Composite - Oil Field - Condensate Tank Battery Vent Gas

No recommendations at this time.

DJVNT\_R - Oil and Gas -Denver-Julesburg Basin Produced Gas Composition from Non-CBM Gas Wells

No recommendations at this time.

FLR99 - Natural Gas Flare Profile with DRE >98%

No recommendations at this time.

PRM01\_R - Oil and Gas -Permian Basin Produced Gas Composition for Non-CBM Wells

Because some of the SCCs applied to the profile were specific to CBM wells, while the profile is specific to non-CBM wells, it is recommended that new source testing be conducted for CMB wells.

SSJCO\_R - Oil and Gas -South San Juan Basin Produced Gas Composition from Non-CBM Gas Wells

No recommendations at this time.

SWVNT\_R - Oil and Gas -SW Wyoming Basin Produced Gas Composition from Non-CBM Wells

No recommendations at this time.