

Description of Data Additions, Changes, and Deletions in FIRE v. 6.25

1. Introduction

FIRE v. 6.25 was released to the EPA for posting on the EPA web site on 9/30/04. This newest release of FIRE incorporates emission factors from all AP42 sections released prior to September 1, 2004. No changes were made to the SCC table for this release of FIRE.

FIRE v. 6.24 was posted on the EPA web site in March, 2004. Since posting version 6.24 there has been only one AP42 section produced. The purpose of releasing FIRE v. 6.25 was threefold:

- to incorporate the emission factors from the one new AP42 section;
- to make changes and/or corrections to existing FIRE emission factors based on user comments; and
- to address user concerns related to the distribution of emission factors.

The first two items are addressed in Section 2 of this document, Section 3 addresses the third item pertaining to user concerns.

2. Data Additions, Changes, and Deletions

The following items describe the data additions, changes, and deletions that were incorporated in FIRE v. 6.25:

2.1 AP42 Section 11.19.2

AP42 Section 11.19.2: Crushed Stone Processing and Pulverized Mineral Processing was added to FIREv.6.25. The created date and revoked date for emission factors related to this section are 8/1/2004.

2.2 Reference Change

“EPA. September 1985. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fourth Edition with Supplements A, B, and C, AP42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.”

The above reference from FIRE is misleading in that it points to AP42 as a reference while many of the factors with this reference were not actually AP42 factors. The reason for the misleading information was that many of the factors with this particular reference were added to FIRE in 1990 with the AP42 reference, although they were actually “gap-filling” emission factors that may have never been in AP42 in the first place. There were

1557 current emission factors in FIRE with this reference. The reference was changed to the following:

“This factor was present in AIRS Facility Subsystem Source Classification Codes and Emission Factor Listing for Criteria Air Pollutants, March 1990, EPA 450/4-90-003. These factors may have been (and may still be) in an AP42 section, or they may have been added to that March 1990 document from other sources. Please check the latest AP42 to verify.”

2.3 Surface Coating Emission Factors

Users of FIRE surface coating emission factors had pointed out that several of the FIRE VOC emission factors for surface coating had been apportioned to multiple processes by dividing the correct facility-wide emission factor of “2,000 lbs/ton solvent used” into several pieces with each piece representing individual processes instead of the entire facility. The individual process emission factors were incorrectly intended to sum to 2,000 lbs. Although it is correct to have emission factors for these individual processes, the VOC emission factor for uncontrolled surface coating operations should always be “2,000 lbs/ton solvent used”.

55 VOC emission factors were located with the problem described in the previous paragraph. The incorrect emission factors were replaced with “2,000 lbs/ton solvent used”, and the following information was added to the notes: “VOC emission factors are estimated assuming that all the solvent used volatilizes during the process.”

2.4 Crematory Emission Factor

A FIRE user pointed out that a PM filterable emission factor for crematory stacks (SCC 3-15-021-01) was incorrectly listed as 5.590E-5 lb/each body burned. A recent review of the emission factor showed that the factor was 8.50E-2 lb/each body burned. The incorrect factor was revoked in FIRE and the correct one was added in its place.

2.5 Lead and Hexane Typo in Emission Factor Notes

A FIRE user pointed out that the lead and hexane emission factors for SCC 1-02-006-01 had a note stating that lead and hexane are listed as HAPs because they are Polycyclic Organic Matter. Lead and hexane are not Polycyclic Organic Matter, so this note was changed to remove the association with POM.

2.6 Cotton Gin Emission Factor

A FIRE user pointed out an inconsistency with the uncontrolled emission factors for one PM filterable and one PM10 filterable emission factor for SCC 3-02-004-10 in comparison to newer controlled emission factors for the same SCC. The older uncontrolled factors were higher than the new controlled factors. The outdated factors from 1992 had been superseded by more recent data, but were never removed from FIRE.

These two factors were revoked from FIRE v.6.25 and a revoked date of 9/1/2004 was used.

2.7 Particleboard Emission Factors

Some emission factors that were added to FIRE v.6.24 for emissions from AP42 section 10.6.2 – Particleboard Manufacture had an incorrect unit description of 3/8 inch board. This incorrect unit description was replaced with the correct unit description of 3/4 inch board.

2.8 New Pollutant Names in FIRE v. 6.24.

A review of some of the pollutants that were added to FIRE in v. 6.24 revealed that they were synonyms of pollutants already in the FIRE database. These pollutant designations that were added to v. 6.24 were corrected in v. 6.25 to show that they are synonyms of existing pollutants. The new FIRE pollutant names (left side of “=” sign) that were associated with their synonyms (right side of “=” sign) are listed below.

HpCDD, total = Heptachlorodibenzo-p-dioxins, total

HpCDF, total = Heptachlorodibenzofurans, total

HxCDD, total = Hexachlorodibenzo-p-dioxins, total

HxCDF, total = Hexachlorodibenzofurans, total

PCDD, total = Polychlorinated dibenzo-p-dioxins, total

PCDD/PCDF, total = Polychlorinated dibenzo-p-dioxins and furans, total

PCDF, total = Polychlorinated dibenzofurans, total

PeCDD, total = Pentachlorodibenzo-p-dioxins, total

PeCDF, total = Pentachlorodibenzofurans, total

TCDD, total = Tetrachlorodibenzo-p-dioxins, total

TCDF, total = Tetrachlorodibenzofurans, total

2.9 PM Emission “Formula” Factors for Boilers

A FIRE user pointed out that some boiler “formula” emission factors for SCC 1-02-004-01 contained multiple “variables” for computation of the final emission factor. Since it was possible to replace one of the variables with a constant, the emission factor formulas were simplified.

2.10 Miscellaneous Fuel Combustion Emission Factors

The emission factors for the following SCC and pollutant combinations were updated to reflect more accurate emission factor calculations recommended by the EPA:

10100701	Carbon monoxide
10100701	Nitrogen oxides (NO _x)
10100701	PM10, filterable
10100701	PM2.5, filterable
10100701	Sulfur oxides (SO _x)
10100701	Volatile organic compounds (VOC)
10100702	Carbon monoxide
10100702	PM10, filterable
10100702	PM2.5, filterable
10100702	Sulfur oxides (SO _x)
10100702	Volatile organic compounds (VOC)
10101002	Carbon monoxide
10101002	PM10, filterable
10101002	PM2.5, filterable
10101002	Volatile organic compounds (VOC)

2.11 Electric Generation – Diesel Reciprocating Engines Emission Factors

The PM filterable, PM10 filterable and PM2.5 filterable emission factors for SCC 2-01-001-02 were corrected. The incorrect factors were given a revoked date of 9/1/2004 and the replacement factors were given a created date of 9/1/2004.

2.12 Fluxing Operations Emission Factor Units

A FIRE user pointed out that the emission factors for SCC 3-04-001-04 displayed units of lbs per “Ton of Metal Processed”. These incorrect units were changed to the correct units of lbs per “Ton of Chlorine Used”

2.13 Secondary Metal Production (Lead) Emission Factor

The emission factor for SCC 3-04-004-03 for the pollutant “PCDF, total” was in FIRE as “14 lb/ton lead produced”. A user pointed this emission factor out as being suspiciously high. This factor was revoked with a revoked date of 9/1/2004.

2.14 Gas Distribution Emission Factor

The 1,3 butadiene emission factor for SCC 4-06-003-01 was determined to be incorrect. The factor was revoked with a revoked date of 9/1/2004.

2.15 Dual Fuel Internal Combustion Engine Emission Factor

The formula emission factor for SO_x for SCC 2-02-004-02 was determined to be in error. The formula was missing negative exponents in the scientific notation of the numbers in the formula. This error was fixed by adding the negative signs into the formula.

2.16 Diesel Engine Emission Factor

The VOC emission factor for large bore diesel engines SCC 2-02-004-01 was corrected from a value of 13.7 lbs / 1,000 gallons of distillate to a value of 11.5 lbs /1,000 gallons of distillate.

3. User Concerns

3.1 Multiple Emission Factors for Individual SCCs

Some users (primarily at the State level) have expressed concerns related to updating their own emission factor data tables with emission factors from FIRE due to FIRE containing multiple emission factors for some SCC, pollutant, control scenarios (e.g. NO_x emission factors for Pre-NSPS, Post-NSPS, Low NO_x burner scenarios assigned to the same SCC). Since SCC designations do not always supply the necessary level of detail, these situations of multiple emission factors are unavoidable in FIRE. It is possible to use the data tables behind the FIRE interface to select one emission factor for each SCC and pollutant scenario. Although AIRS is no longer in existence, the AIRS flag (AFS) in the FIRE data table can be viewed in several data viewers (FoxPro, ACCESS, EXCEL). The AFS flag is set to “True” for only one factor per SCC, pollutant scenario.

3.2 Standard Units

Some users have expressed concern about the use of multiple sets of units for the same SCC in FIRE. FIRE uses the same units as those that are published in AP42 updates, which frequently results in several units being used with the emission factors from one SCC. This is especially a problem since the EPA no longer recognizes standard units for individual SCCs. This problem must first be addressed with any new AP42 sections that are published. Alternatively, it would be possible for a conversion of most of the emission factors in FIRE to a standard set of units, but in order for this to be accomplished, standard units must still be established at least for use within FIRE.

3.3 National Emission Inventory Input Format (NIF) Pollutant Codes

Some users have asked that NIF pollutant codes be added to the FIRE data. This task may be accomplished in a future work assignment. It would be straight forward to add NIF pollutant codes to FIRE for criteria pollutants, but to extend the addition of NIF codes to toxic pollutants would require more effort due to different toxic pollutant groupings in FIRE and the NIF.