

# Input Data Set Construction

## Part (3)

# Temporal Profile Development

# Introduction

- Temporal profile definition:



“A temporal profile describes how the activity of an emission source or source category changes with time within the base calendar year.”

- A Temporal Profile can Express the Source Activity Occurring during a Season, Month, Day, or Hour

# Match Temporal Resolution to Program Needs

<u>Purpose</u>	<u>Temporal Resolution</u>
Planning Inventory	Seasonal
Modeling Inventory	Hourly for a Weekday in August
Weekday/Weekend Studies	Daily

# Storing Temporal Data

- CEIDARS PROCESS Tables
  - Year and process specific
  - Monthly activity fractions
  - Operating weeks per year
  - Code for operating days per week
  - Code for operating hours per day

# Storing Temporal Data

- CEFS MONTH Table

- Process specific
- Monthly activity fractions
- Actual operating days per month
- Code for operating days per week
- Code for operating hours per day



# Storing Temporal Data

- CEFS CATMONTH Table
  - Category specific by EIC code
  - Monthly activity fractions
  - Actual operating days per month
  - Code for operating days per week
  - Code for operating hours per day



# Storing Temporal Data

- CEFS CATDAY Table
  - Category specific by EIC code
  - Month specific
  - Daily activity fractions
- CEFS CATHOUR Table
  - Category specific by EIC code
  - Month specific
  - Day Specific
  - Hourly activity fractions



# Sources of Temporal Data

- CEIDARS PROCESS Tables
  - Districts provide data for all point sources and some area sources
  - ARB provides data for rest of area sources (including on-road and off-road mobile)

# Sources of Temporal Data

- CEFS MONTH Table
  - Populated from CEIDARS process table
  - Can be updated with data from districts, special studies, and other sources
- CEFS CATMONTH Table
  - Area source category data from CEIDARS
  - Other EIC category data from CEIDARS, special studies, and other sources

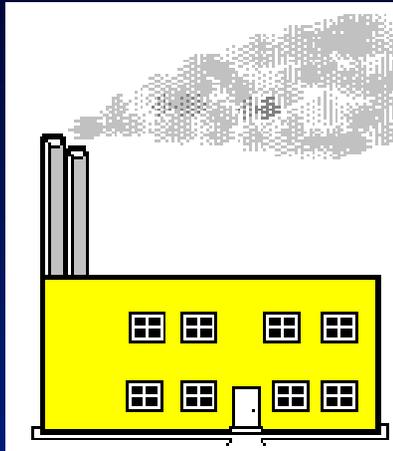
# Sources of Temporal Data

- CEFS CATDAY Table
  - Can be updated with data from districts, special studies, and other sources
- CEFS CATHOUR Table
  - Can be updated with data from districts, special studies, and other sources

# Development of Temporal Profiles

- CEIDARS Tables are Primary Source
- Monthly Fractions, DPWK and HPDY Fields Need to be Populated
- Very Important to have Monthly Fraction Data for Intermittent Sources

# Example of an Intermittent Source



**BOILER**

CEIDARS Process Data:

**SCC = 10200501, SIC = 2951**

**Hours/Day = 8**

**Days/Week = 7**

**Weeks/Year = 17**

**Relative Monthly Throughput**

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

**.25 .25 .25 .25**

# Old Calculation Method for Seasonal Emissions

- Point Sources

$$\text{SEMS (t/d)} = \text{EMS (t/y)} / \{\text{OP\_DAY} * \text{WEEK\_YR}\}$$

Where:

SEMS = Seasonal emissions (tons/seasonal day)

EMS = Annual Emissions (tons/year)

OP\_DAY = # days of operation per week

WEEK\_YR = # operating weeks per year

# Old Calculation Method Intermittent Source

- Point Sources

$$\text{SEMS (t/d)} = \text{EMS (t/y)} / \{\text{OP\_DAY} * \text{WEEK\_YR}\}$$

$$\text{SEMS (t/d)} = 1000 / \{7 * 17\}$$

$$\text{SEMS (t/d)} = \text{Summer (t/d)} = \text{Winter (t/d)} = 8.403$$

$$\text{EMS (t/d)} = \text{EMS (t/y)} / 365 = 1000 / 365 = 2.740$$

Seasonal Emissions are 3 Times Larger  
than Annual Emissions!!

# New Calculation Method

(not implemented yet!)

$$\text{SEMS (t/d)} = \text{EMS (t/y)} * \text{TF}$$

Where:

SEMS = Seasonal emissions (tons/seasonal day)

EMS = Annual Emissions (tons/year)

TF (Temporal Factor) = SEAS\_FRAC / 182.5

SEAS\_FRAC = (i) Sum of fractional monthly throughputs  
Summer: May-October  
Winter: November-April

or (ii) The ratio of the operating days  
in the season to the operating days in  
the year

# New Calculation Method Intermittent Source

$$\text{SEMS (t/d)} = \text{EMS (t/y)} * \text{TF}$$

$$\text{Summer EMS (t/d)} = 1000 * \{ .25 + .25 + .25 + .25 \} / 182.5$$

$$\text{Summer EMS (t/d)} = 5.479$$

$$\text{Winter EMS (t/d)} = 1000 * \{ 0 \} / 182.5$$

$$\text{Winter EMS (t/d)} = 0$$

With this method, calculated seasonal emissions more accurately reflect real world operation

# Help in Developing Temporal Profiles

- Existing Temporal Data in CEIDARS
- Data Sources such as Permit Conditions, Facility Surveys, and Special Studies
- Emission Inventory Procedural Manual, Volume I defines Codes for DPWK and HPDY - New Codes can be Created as Needed

# Summary

- ARB will Populate Table MONTH and CATMONTH with data from CEIDARS
- Uniform Activity will be Assigned where Monthly Fractions are all Zero or Null
- Districts should update CEIDARS with Actual Monthly Fraction Data, DPWK and HPDY