

## Case Study Number 9-2

### Estimating PM<sub>10</sub> and PM<sub>2.5</sub> Emissions from Agricultural Field Burning

#### *Exercise Objective*

This exercise will test your ability to apply the methodology used to estimate emissions from agricultural field burning operations.

#### *Directions*

- Review the background information and data provided.
- Convene groups of 4-5 people.
- Answer the questions in the “Problem” section. These will guide you in your thinking to organize the data and then using it to estimate emissions.
- You will have 10 minutes to complete these tasks before the class reconvenes for discussion. Each group will be assigned specific questions and asked to present its results. Other groups will be asked if they agree or disagree with the findings.

#### *Background*

This hypothetical case study involves developing a PM<sub>10</sub> and PM<sub>2.5</sub> inventory for burning a field of wheat stubble. The method is to develop a local PM<sub>10</sub> and PM<sub>2.5</sub> inventory using county level data where available, and filling in the gaps with NEI default data.

#### *Available Data*

This case study involves wheat stubble burning and uses county-specific data. The activity data that was obtained are the acres of wheat burned by month. This was obtained from burn permits that are usually issued by the county fire department. Also, the fuel loading for wheat stubble was obtained from the county agricultural extension office.

The following table shows a summary of the data that are available for use in the case study.

Number of Acres Burned in June	1,950
Wheat Stubble Fuel Loading	1 ton/acre

***Problem***

You have been asked by your supervisor to develop an estimate of  $PM_{10}$  and  $PM_{2.5}$  emissions from these activities during the month of June. The spatial resolution for this inventory is the county and the temporal resolution is monthly. It is suggested that you approach the problem in the following manner.

1. What is the basis of the activity data for agricultural burning?
2. What does the loading factor represent?
3. What is the methodology for estimating  $PM_{10}$  emissions from agricultural burning operations?
4. What is your estimate of the  $PM_{10}$  emissions from wheat stubble burning in the county for the month of June?
5. How would  $PM_{2.5}$  emissions be estimated if this case study required that an estimate of  $PM_{2.5}$  be developed?

6. How would annual PM<sub>10</sub> emissions from agricultural burning be calculated?

*Notes*

- The emission factor for wheat stubble burning is 8.82 pounds per tons of wheat stubble burned for PM<sub>10</sub>.
- The emission factor for wheat stubble burning is 8.34 pounds per tons of wheat stubble burned for PM<sub>2.5</sub>.