Minnesota Pollution Control Agency

AIR QUALITY
520 LAFAYETTE ROAD
ST. PAUL, MN 55155-4194

PERMIT APPLICATION FORM **EC-13A**

HAZARDOUS AIR POLLUTANTS CALCULATION FORM (VOLATILE HAPS)

3/25/03

- Duplicate this form as necessary, or attach sheets with equivalent information.
- Instructions begin on Page 4.

1) AQ Facility ID No.: _____

2) Facility Name: _____

3) Emission Unit Identification Number: _____

4) Stack/Vent Designation Number: _____

5) Control Equipment Designation Number: _____

Complete item 6 or 7, not both.

6) Calculations Summary using Material Content:

Potential Emissions (Do not complete this table if using this form for Registration Permit Option D. Go to Actual Emissions Table in item 6.)

6a) Volatile HAP Name (CAS)	**6b)** Maximum HAP Content (lbs/gal)	**6c)** Maximum Material Usage Rate (gal/hr)	**6d)** Maximum Uncontrolled HAP Emission Rate (lbs/hr)	**6e)** Maximum Uncontrolled HAP Emissions (tons/yr)	**6f)** Pollution Control Efficiency (%)	**6g)** Maximum Controlled HAP Emissions (tons/yr)	**6h)** Limited Controlled HAP Emissions (tons/yr)

Actual Emissions

6a) Volatile HAP Name (CAS)	**6i)** Actual HAP Content (lbs/gal)	**6j)** Actual Material Usage Rate (gal/hr)	**6k)** Actual Uncontrolled HAP Emission Rate (lbs/hr)	**6l)** Actual Uncontrolled HAP Emissions (tons/yr)	**6f)** Pollution Control Efficiency (%)	**6m)** Actual Controlled HAP Emissions (tons/yr)

7) Calculations Summary using Emission Factors:

Potential Emissions (Do not complete this table if using this form for Registration Permit Option D. Go to the Actual Emission Table in item 7.)

7a) Volatile HAP Name (CAS)	**7b)** Maximum Emission Factor	**7c)** Maximum Hourly Production or Material Use	**7d)** Maximum HAP Emission Rate (lbs/hr)	**7e)** Maximum Uncontrolled HAP Emissions (tons/yr)	**7f)** Pollution Control Efficiency (%)	**7g)** Maximum Controlled HAP Emissions (tons/yr)	**7h)** Limited Controlled HAP Emissions (tons/yr)

Actual Emissions

7a) Volatile HAP Name (CAS)	**7i)** Actual Emission Factor	**7j)** Actual Hourly Production or Material Use	**7k)** Actual Uncontrolled HAP Emission Rate (lbs/hr)	**7l)** Actual Uncontrolled HAP Emissions (tons/yr)	**7f)** Pollution Control Efficiency (%)	**7m)** Actual Controlled HAP Emissions (tons/yr)

8) Operating Limitations, if applicable: (Ignore this item if using the form for Registration Permit Option D).

EC-13A Hazardous Air Pollutants (Volatile)

Actual Emissions:

All major sources under Minn. R. 7007.0200, subp. 2 shall provide actual emission rates, in total tons per year, or if emissions of a Hazardous Air Pollutant (HAP) are less than one ton per year, in pounds per year, of each HAP for the stationary source as a whole. You are not required to report HAP actual emissions unit-by-unit, although you may do this if this is the only or most convenient way to calculate HAP emissions.

For sources applying for Registration Permit Option D, or who are using this form for compliance tracking for Registration Permit Option D, you must provide HAP actual emissions calculations on a unit-by-unit basis. See the *Registration Permit Handbook* for more information on calculating HAP actual emissions.

Actual emissions shall be calculated using the emission unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the elected time period. You may use the FIRE database, other EPA publications such as AP-42, test data, material balances, or other types of engineering calculations to estimate HAP emissions. You can also use information and calculations for actual emissions that are different from the calculation methods detailed on this form. However, if you do not use this form for actual emissions, the information used in calculating actual emissions must be attached and included in the permit application.

1) **AQ Facility ID No. --** Fill in your Air Quality Facility ID Number as indicated on the *Facility Information Form* (GI-01 or RP-01), item 1a.

2) **Facility Name --** Enter your facility name as indicated on the *Facility Information Form* (GI-01 or RP-01), item 2.

3) **Emission Unit Identification Number --** Fill in the identification number of the emission unit. Obtain this number from your *Emission Unit Information Form* (GI-05B). Indicate total facility or multiple units if applicable. [Note: If you are using this form for Registration Permit Option D, you did not fill out Form GI-05B; instead, just provide information identifying the emission unit.]

4) **Stack/Vent Designation Number --** Fill in the designation number of the stack(s) or vent(s) through which the unit will exhaust into the atmosphere. Obtain these numbers from Form GI-05B. Indicate total facility or multiple stacks if applicable. [Note: If you are using this form for Registration Permit Option D, you did not fill out Form GI-05B; instead, just provide information identifying the emission unit.]

5) **Control Equipment Designation Number** -- Fill in the designation number of the control equipment (CE) through which the unit will exhaust. Obtain these numbers from your *Emission Unit Information Form* (GI-05B). If you are using this form for Registration Permit Option D, fill in the description from Form RP-D2. [Note: If you are using this form for Registration Permit Option D, any control efficiency used for controlling HAPs must be verified with a performance test as explained in Minn. R. 7011.0070, subp. 2.]

Complete either item **6** or **7**, not both. Item **6** uses the HAP content of materials in the calculations, while item **7** uses emission factors.

6) Calculations Summary Table using HAP Content of Materials:

6a) Volatile HAP Name -- Identify the HAP (e.g., Methyl Ethyl Ketone, Methylene Chloride, etc.) by the chemical name used in the list of HAPs attached to Form GI-09A. This list is also found in Section 112(b) of the Clean Air Act and in 40 CFR pt. 63. Provide the chemical abstract system (CAS) number if available.

6b) Maximum HAP Content --Fill in the maximum HAP content for that specific HAP in pounds per gallon, for each HAP. This information can be obtained from the Material Safety Data Sheet (MSDS) or the material supplier. If a range is given on the MSDS (e.g., 1-3 lb/gal) use the highest number in the range. You may need to calculate this number using the material density (in pounds per gallon) and the HAP weight percent for the material (e.g., 10 lbs paint/gallon × 30% by weight MEK = 3 lbs MEK/gallon paint).

Attach the MSDS to the application, or submit it electronically (disk or CD).

6c) Maximum Material Usage Rate -- Fill in the maximum usage rate of the HAP containing material in gallons per hour.

6d) Maximum HAP Emission Rate -- Fill in the maximum possible HAP hourly Emission Rate, for each HAP. Use this method for calculations. This example is for a painting/coating operation.

HAP Emission Rate [lb / hr]:

$$= \text{Maximum HAP Content}\left[\frac{\text{lb}}{\text{gal}}\right] \times \text{Number of guns} \times \text{Max. Application Rate}\left[\frac{\text{gal}}{\text{hr}}\right]$$

$$= (\text{item 6b}) \times (\text{item 6c})$$

Where the Maximum Material Usage Rate = Number of Guns × Maximum Application Rate.(e.g., The number of guns in the booth is 2, the maximum application rate is 5 gal/hr, then the Maximum Material Usage Rate is 10 gal/hr.)

In general, use this method for all other operations:

HAP Emission Rate [lb / hr]:

$$= \text{Maximum HAP Content}\left[\frac{\text{lb}}{\text{gal}}\right] \times \text{Maximum Material Usage Rate}\left[\frac{\text{gal}}{\text{hr}}\right]$$

$$= (\text{item 6b}) \times (\text{item 6c})$$

6e) Maximum Uncontrolled HAP Emissions -- Fill in the Maximum Uncontrolled HAP Emissions, for each HAP. Use this method for calculations.

Maximum Uncontrolled HAP Emissions [tons / yr]:

$$= \text{Emission Rate}\left[\frac{\text{lb}}{\text{hr}}\right] \times 4.38\left[\frac{\text{hrs}}{\text{yr}} \cdot \frac{\text{tons}}{\text{lb}}\right]$$

$$= (\text{item 6d}) \times 4.38$$

(e.g., the maximum possible HAP hourly emission rate is 5.28 lb/hr, then the maximum possible uncontrolled HAP emissions are 5.28[lb/hr] × 4.38[hrs/yr·tons/lb] = 23.1 tons/yr)

6f) Pollution Control Efficiency -- The pollution control efficiency is the product of the capture efficiency and the destruction/collection efficiency indicated on Form GI-05A or Form RP-D2. Enter this number here and remember to include on Form CD-01 a plan to demonstrate and maintain the destruction/collection efficiency (unless you are using this form for Registration Permit Option D - in that case, Form CD-01 does not apply). The efficiency should be expressed for each pollutant. If there is no control for the particular pollutant, then indicate zero. [Note: If you are using this form for Registration Permit Option D, any control efficiency used for controlling HAPs must be verified with a performance test as explained in Minn. R. 7011.0070, subp. 2.]

6g) Maximum Controlled HAP Emissions -- Fill in the Maximum Controlled HAP Emissions, for each HAP. Calculate the emissions by using this method:

Maximum Controlled HAP Emissions [tons / yr]:

$$= \text{Max. Uncontrolled HAP Emissions} \times \left(\frac{100 - \text{Pollution Control Efficiency}}{100} \right)$$

$$= (\text{item 6e}) \times \left(\frac{100 - (\text{item 6f})}{100} \right)$$

e.g., the maximum possible uncontrolled HAP emissions are 23.1 tons/yr and the control efficiency is 90%, then the maximum controlled HAP emissions are 23.1 [tons/yr] × (100-90)/100 = 2.3 tons/yr)

6h) Limited Controlled HAP Emissions -- The Limited Controlled Emissions are calculated by taking into account all limitations on operation of the source you are proposing to comply with in this application. These limitations include limits on hours of operation, limits on the HAP content of the materials used, limits on the rate or amount of materials used, etc. You start the calculation of Limited Controlled Emissions by recalculating the Emission Rate and taking into account the limitations proposed.

If an emission unit is subject to an emission limitation specified in 40 CFR pt. 60, 40 CFR pt. 61, 40 CFR pt. 63 or Minn. R. ch. 7011, you must show this requirement in the calculation of Limited Controlled Emissions and take this into account in calculating the Limited Controlled Emissions. If you choose to propose to comply with more a stringent limit, you should state this clearly and show the resulting allowed emissions in this calculation.

6i) Actual HAP Content -- Fill in the actual HAP content for that specific HAP in pounds per gallon. This information can be obtained from the MSDS or the material supplier. If a range is given, use the arithmetic mean (e.g., 1-3 lb/gal would be 2 lb/gal).

6j) Actual Material Usage Rate -- Fill in the usage rate of the HAP containing material in gallons per hour, based on the average of the last two years, unless you are using this form for Registration Permit Option D. If you are using this form for Option D, use the quantity used during the most recent 12 months. If this is a new unit or no records exist, use a reasonable estimate of how many hours the unit will be operated, how much material will be used, etc.

6k) **Actual Emission HAP Rate --** Fill in the actual HAP hourly Emission Rate, for each HAP. Use this method for calculations:

HAP Emission Rate [lb / hr]:

$$= \text{Actual HAP Content}\left[\frac{\text{lb}}{\text{gal}}\right] \times \text{Actual Material Usage Rate}\left[\frac{\text{gal}}{\text{hr}}\right]$$

$$= (\text{item 6i}) \times (\text{item 6j})$$

6l) **Actual Uncontrolled HAP Emissions --** Fill in the Actual Uncontrolled HAP Emissions, for each HAP. Use this method for calculations.

Actual Uncontrolled HAP Emissions [tons/yr]:

$$= \text{Emission Rate}\left[\frac{\text{lb}}{\text{hr}}\right] \times \text{Actual Hours of operation}\left[\frac{\text{hrs}}{\text{yr}}\right] \times 0.0005\left[\frac{\text{ton}}{\text{lb}}\right]$$

$$= (\text{item 6k}) \times \text{Hours/yr} \times 0.0005$$

Use your actual hours of operation, based on the average of the last two years, unless you are using this form for Registration Permit Option D. If you are using this form for Option D, use the hour operated during the most recent 12 months. If this is a new unit or no records exist, use a reasonable estimate of how many hours the unit will be operated. The hours assumed on this form should be the same as those used to calculated the VOC actual emissions for the given unit.

6m) **Actual Controlled HAP Emissions --** HAPs emissions estimates must be reported to four places to the right of the decimal point.

Actual Controlled HAP Emissions [tons / yr]:

$$= \text{Actual Uncontrolled HAP Emissions} \times \left(\frac{100 - \text{Pollution Control Efficiency}}{100}\right)$$

$$= (\text{item 6l}) \times \left(\frac{100 - (\text{item 6f})}{100}\right)$$

7) Calculations Summary Table Using Emission Factors:

7a) **Volatile HAP Name --** Identify the HAP (e.g., Methyl Ethyl Ketone, Methylene Chloride, etc.) by the chemical name used in the list of HAPs attached to Form GI-09A. This list is also found in Section 112(b) of the Clean Air Act and in 40 CFR pt. 63. Provide the chemical abstract system (CAS) number if available.

7b) **Maximum HAP Emission Factor --** Fill in the emission factor **including the units**, such as pounds per gallon or pounds per million BTU. Sources you may use include US EPA's AP-42, EPA's FIRE database, or source-specific test data if the test was completed in accord with MPCA policies and rules. If the factor given in an EPA document is given as a range, you should use the maximum number in the range to calculate potential emissions. Include a list of the sources for your emission factors with the following:

- include a copy of the emission factors and indicate their source, and
- show the calculations used to determine the maximum continuous rates

Note that you cannot use an emission factor that includes the effect of control equipment unless you have conducted a performance test in accord with Minn. R. 7017.2001 through 7017.2060 to demonstrate that your control equipment achieves the same efficiency as in the emission factor.

7c) **Maximum Hourly Production or Material --** Fill in the maximum production or material usage **using the same units as the emission factor**. For example, if the emission factor is in pounds per gallon of paint sprayed, fill in the maximum gallons per hour that paint can be sprayed.

7d) **Maximum HAP Emissions Rate --** Fill in the maximum emission rate for each HAP by multiplying column **7b** x column **7c**.

7e) **Maximum Uncontrolled HAP Emissions** -- Fill in the Maximum Uncontrolled Emissions in tons/year by multiplying the number in column **7d** by 4.38, for each HAP.

7f) **Pollution Control Equipment Efficiency --** The pollution control efficiency is the product of the capture efficiency and the destruction/collection efficiency indicated on Form GI-05A or Form RP-D2. Enter this number here and remember to include on Form CD-01 a plan to demonstrate and maintain the destruction/collection efficiency (unless you are using this form for Registration Permit Option D - in that case, Form CD-01 does not apply). The efficiency should be expressed for each pollutant. If there is no control for the particular pollutant, then indicate zero. [Note: If you are using this form for Registration Permit Option D, any control efficiency used for controlling HAPs must be verified with a performance test as explained in Minn. R. 7011.0070, subp. 2.]

7g) **Maximum Controlled HAP Emissions --** tons per year - Fill in this number by multiplying column **7e** by (1 - column **7f**/100).

7h) **Limited Controlled HAP Emissions** -- The Limited Controlled Emissions are calculated by taking into account all limitations on operation of the source you are proposing to comply with in this application. These limitations include limits on hours of operation, limits on the HAP content of the materials used, limits on the rate or amount of materials used, etc. You start the calculation of Limited Controlled Emissions by recalculating the Emission Rate and taking into account the limitations proposed.

If an emission unit is subject to an emission limitation specified in 40 CFR pt. 60, 40 CFR pt. 61, 40 CFR pt. 63 or Minn. R. ch. 7011, you must show this requirement in the calculation of Limited Controlled Emissions and take this into account in calculating the Limited Controlled Emissions. If you choose to propose to comply with more a stringent limit, you should state this clearly and show the resulting allowed emissions in this calculation.

7i) **Actual Emission HAP Factor --** Fill in the emission factor **including the units**, such as pounds per gallon or pounds per million BTU. This number will most likely be the same number in item **7b**; however, if the factor given in an EPA document is given as a range, you may be able to use the arithmetic mean of the range to calculate actual emissions.

7j) **Actual Hourly Production or Material Use --** Fill in the actual production or material usage **using the same units as the emission factor**. For example, if the emission factor is in pounds per gallon of paint sprayed, fill in the actual gallons per hour that paint can be sprayed. If this is a new unit or no records exist, use a reasonable estimate of how much material will be used.

7k) **Actual Uncontrolled HAP Emission Rate --** Fill in the actual uncontrolled emission rate for each HAP by multiplying column **7i** x column **7j**

7l) **Actual Uncontrolled HAP Emissions --** Fill in the Actual Uncontrolled HAP Emissions, for each HAP. Use this method for calculations.

Actual Uncontrolled HAP Emissions [tons/yr]:

$$= \text{Emission Rate}\left[\frac{\text{lb}}{\text{hr}}\right] \times \text{Actual Hours of operation}\left[\frac{\text{hrs}}{\text{yr}}\right] \times 0.0005\left[\frac{\text{ton}}{\text{lb}}\right]$$

$$= (\text{item 7k}) \times \text{Hours/yr} \times 0.0005$$

Use your actual hours of operation, based on the average of the last two years, unless you are using this form for Registration Permit Option D. If you are using this form for Option D, use the hour operated during the most recent 12 months. If this is a new unit or no records exist, use a reasonable estimate of how many hours the unit will be operated. The hours assumed on this form should be the same as those used to calculated the VOC actual emissions for the given unit.

7m) **Actual Controlled HAP Emissions --** HAPs emissions estimates must be reported to four places to the right of the decimal point.

Actual Controlled HAP Emissions [tons / yr]:

$$= \text{Actual Uncontrolled HAP Emissions} \times \left(\frac{100 - \text{Pollution Control Efficiency}}{100}\right)$$

$$= (\text{item 7l}) \times \left(\frac{100 - (\text{item 7f})}{100}\right)$$

8) **Operating Limitations --** Please note that the Maximum Possible Uncontrolled Emissions did not consider any limitations in determining the PTE. If you are willing to accept a permit limitation (e.g., hours of operation or usage) state the limiting factors and the PTE after limiting factors are taken into account. Attach additional sheets that show calculations and assumptions.