



Department of Environmental Quality  
1410 N. Hilton, Boise, ID 83706  
For assistance, call the  
Air Permit Hotline - 1-877-5PERMIT

Pre-Application Meeting Information  
Emission Inventories

## Department of Environmental Quality - Air Quality Division Preapplication Meeting Package

### EMISSIONS INVENTORIES (EI)

#### *Requirements*

Applicants/consultants are expected to read and understand the regulations and to follow instructions.

When applying for a Permit to Construct (PTC), applicants are required to include facility-wide Potential to Emit (PTE) (Tables 1, 2, 3, and 4), Hazardous Air Pollutants (HAP) PTE (Table 5), and Toxic Air Pollutants (TAP) PTE (Tables 6 and 7) in their EI spreadsheet. A PTC is usually required for construction of a new facility, modification to an existing facility, and compliance by an existing facility without a permit.

Use the same emission unit name throughout the application (i.e., in air pollution control equipment forms and for modeling purposes).

The application must **show in detail all calculations** used to develop the EI and include the following:

- An electronic copy of the spreadsheet (i.e., Excel file).
- All calculations including calculation formulas.
- Clear statements on all assumptions relied upon in estimating emissions.
- Documentation of emissions factors used to estimate emissions. If the emissions factor documentation (such as an AP-42 emissions factor from the US Environmental Protection Agency) is readily available to DEQ, a simple reference to the emissions factor suffices. If the emissions factor documentation is not readily available to DEQ, the applicant must submit the documentation with the application. Ask DEQ if you are uncertain. Documentation may consist of manufacturer guarantees; research conducted by trade organizations, published emission factors, and source test results. If multiple factors are applicable to a given operation, note why the factor used is the most representative.
- Copies of manufacturer guarantees upon which emissions inventories are based.
- Best available emission information (see [DEQ Guidance on Emissions Data Hierarchy](#)).
- Source test report, if source tests are used as the basis for emissions estimates. If the source test report is on file with DEQ, provide the date the source test was submitted, name of the facility, and the emission unit tested. Source data from similar emissions units may be considered reliable if a clear description of why the sources are similar is provided. Similar sources are those that the applicant has shown serve a similar function, use similar raw materials, and have similar processing rates.

Fugitive emissions of New Source Review (NSR) regulated air pollutants from the source categories listed below must be included in the emission inventory.

#### Listed Source Categories for Inclusion of Fugitive Emissions

- |   |   |
|---|---|
| • Coal cleaning plants (with thermal dryers)    | • Carbon black plants (furnace process)                                       |
| • Kraft pulp mills                              | • Primary lead smelters   |
| • Portland cement plants                        | • Fuel conversion plants  |
| • Primary zinc smelters                         | • Sintering plants  |
| • Iron and steel mills                          | • Secondary metal production plants   |
| • Primary aluminum ore reduction plants         | • Chemical process plants (excluding ethanol plants by natural fermentation). |
| • Primary copper smelters                       | • Fossil-fuel fired boilers totaling more than 250 MMBtu/hr                   |
| • Municipal incinerators -250 T/day of refuse   | • Petroleum storage and transfer units with total capacity of 300,000 barrels |
| • Hydrofluoric, sulfuric, or nitric acid plants | • Taconite ore processing plants  |
| • Petroleum refineries                          | • Glass fiber processing plants   |
| • Lime plants                                   | • Charcoal production plants  |
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- Phosphate rock processing plants
- Coke oven batteries
- Sulfur recovery plants
- Fossil fuel-fired steam electric plants greater than 250 MMBtu/hr)
- Categories regulated by NSPS or NESHAP prior to 8/7/80

For TAP EI, applicants must demonstrate preconstruction compliance with TAP standards prescribed in Section 210 of the [Rules for the Control of Air Pollution in Idaho](#). To assist applicants, a TAP completeness checklist is available on DEQ’s website at [http://www.deq.idaho.gov/media/576565-ptc\\_checklist\\_tap\\_completeness.docx](http://www.deq.idaho.gov/media/576565-ptc_checklist_tap_completeness.docx).

### Potential to Emit (PTE)

IDAPA 58.01.01 defines PTE as the maximum capacity of a facility or stationary source to emit an air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the facility or source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is state or federally enforceable. Secondary emissions do not count in determining the potential to emit of a facility or stationary source.

### Uncontrolled PTE

Based on the definition of PTE, uncontrolled PTE is defined as the maximum capacity of a facility or stationary source to emit an air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the facility or source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall **not** be treated as part of its design since the limitation or the effect it would have on emissions is **not** state or federally enforceable.

The uncontrolled PTE is used to determine if a facility is a “Synthetic Minor” source of emissions. Synthetic Minor sources are facilities that have an uncontrolled PTE for regulated air pollutants or HAP above the applicable Major Source threshold without permit limits. Therefore, the uncontrolled PTE should be determined for new facilities. For existing facilities consult with DEQ staff to determine if the uncontrolled PTE needs to be determined.

## ***Emissions Inventory Examples***

Sample illustrations on how to calculate facility-wide PTE, HAP PTE, and TAP EI are provided in the following sections. Due to the complexity of the regulations, it is not practical to provide examples to cover all scenarios.

### PTE calculation example

A new boiler has a heat input rate of 100 MMBtu/hr and will burn sawmill wood waste, operate 50 weeks per year, and use an Electrostatic Precipitator (ESP) with 99% control efficiency to control PM<sub>2.5</sub> emissions.

The applicant applies for a permit to limit the boiler to operate 50 weeks per year and to require the boiler to use ESP with 99% control efficiency to control PM<sub>2.5</sub> emissions.

- **New boiler uncontrolled PTE for PM<sub>2.5</sub> emissions**  
 $(100 \text{ MMBtu/hr}) \times (0.5 \text{ lb/MMBtu, PM}_{2.5} \text{ emissions factor, uncontrolled}^1) \times (8,760 \text{ hr/yr}) \times (1 \text{ T/2000 lb}) = 219 \text{ T/yr}$
- **New boiler PTE for PM<sub>2.5</sub> emissions**  
 $(100 \text{ MMBtu/hr}) \times (0.5 \text{ lb/MMBtu, PM}_{2.5} \text{ emissions factor, uncontrolled}^1) \times (1-99\%) \times (8,760 \text{ hr/yr}) \times (50 \text{ wk} / 52 \text{ wk}) \times (1 \text{ T/2000 lb}) = 2.1 \text{ T/yr}$

<sup>1</sup> Reference EPA AP-42, Section 1.6, Table 1.6-1, rev. 9/03.

### HAP PTE calculation example

An applicant applies for a permit for a new spray booth. The new spray booth is proposed to use three spray guns each with a rated capacity of 5 gal/hr and to use one paint with a density of 7 lb/gal. According to Safety Data Sheet (SDS, formerly MSDS) of the paint, Composition/Information on Ingredients section, the paint has 40 wt% of Xylene and 40 wt% of Benzene. These are HAPs, according to Clean Air Act Amendments of 1990 List of Hazardous Air Pollutants. The gun will be used 7 hrs/day, 5 days/wk, and 52 wks/yr. The applicant proposes to use an oxidizer with 90% of control efficiency to control the HAP emissions.

- **Uncontrolled HAP PTE**

- The uncontrolled PTE of Xylene emissions from the new spray booth is calculated as:  
 $(3 \text{ spray guns}) \times (5 \text{ gal/hr}) \times (7 \text{ lb/gal}) \times (40\% \text{ Xylene}) \times (8,760 \text{ hrs/yr}) / (2000 \text{ lb/T}) = 184.0 \text{ T/yr}$
- The PTE of Benzene emissions from the new spray booth is calculated as:  
 $(3 \text{ spray guns}) \times (5 \text{ gal/hr}) \times (7 \text{ lb/gal}) \times (40\% \text{ Benzene}) \times (8,760 \text{ hr/yr}) / (2000 \text{ lb/T}) = 184.0 \text{ T/yr}$
- The total uncontrolled HAP PTE from the new spray booth is 184.0 T/yr of Xylene + 184.0 T/yr of Benzene = 368.0 T/yr.

<sup>2</sup> Reference Safety Data Sheet (SDS), Composition/Information on Ingredients, weight percentages (wt %) of Xylene and Benzene.

- **HAP PTE**

- The PTE of Xylene emissions from the new spray booth is calculated as:  
 $(3 \text{ spray guns}) \times (5 \text{ gal/hr}) \times (7 \text{ lb/gal}) \times (40\% \text{ Xylene}) \times (8 \text{ hrs/day}) \times (5 \text{ days/wk}) \times (52 \text{ weeks/yr}) \times (1-90\%) / (2000 \text{ lb/T}) = 4.4 \text{ T/yr}$
- The PTE of Benzene emissions from the new spray booth is calculated as:  
 $(3 \text{ spray guns}) \times (5 \text{ gal/hr}) \times (7 \text{ lb/gal}) \times (40\% \text{ Benzene}) \times (8 \text{ hrs/day}) \times (5 \text{ days/wk}) \times (52 \text{ wks/yr}) \times (1-90\%) / (2000 \text{ lb/T}) = 4.4 \text{ T/yr}$
- The total HAP PTE from the new spray booth is 4.4 T/yr of Xylene + 4.4 T/yr of Benzene = 8.8 T/yr.

TAP calculation and compliance example

For non-carcinogenic TAP listed in IDAPA 58.01.01.585, hourly emissions are based on 24-hr average because non-carcinogenic TAP standards are based on 24-hr average.

For carcinogenic TAP listed in IDAPA 58.01.01.586, emissions are based on annual (8,760 hrs) average because carcinogenic TAP standards are based annual average.

An applicant applies for a permit for a new spray booth only. The new spray booth is proposed to use one spray gun with a rated capacity of 5 gal/hr and one paint with a density of 7 lb/gal. According to Safety Data Sheet (SDS), Composition/Information on Ingredients, the paint has 40 wt% of Xylene and 40 wt% of Benzene. The gun will be used 8 hrs/day, 5 days/wk, and 52 wks/yr.

- **Non-carcinogenic TAP**

Because Xylene is a non-carcinogenic TAP as listed under IDAPA 58.01.01.585, its hourly emissions rate is calculated on 24-hour average as follows:

$(5 \text{ gal/hr, gun capacity}) \times (7 \text{ lb/gal, paint density}) \times (40 \text{ wt\% of Xylene}) \times (5 \text{ hrs/day, proposed to-be-permitted operating hours}) / (24 \text{ hrs/day, the averaging time by the Rules for the Control of Air Pollution in Idaho}) = 2.9 \text{ lb/hr.}$

Because 2.9 lb/hr, based on 24-hr average, is less than the screening emissions level (EL) of 29 lb/hr for Xylene, the facility has demonstrated compliance with the standard for Xylene.

- **Carcinogenic TAP**

Because Benzene is a carcinogenic TAP listed under IDAPA 58.01.01.586, its hourly emissions rate is calculated on annual average as follows:

$(5 \text{ gal/hr, gun capacity}) \times (7 \text{ lb/gal, paint density}) \times (40 \text{ wt\% of Benzene}) \times [(5 \text{ hrs/day}) \times (5 \text{ days/wk}) \times (52 \text{ wks/yr}), \text{ proposed to-be-permitted operating hours}] / (8,760 \text{ hours/yr, the averaging time by the Rules for the Control of Air Pollution in Idaho}) = \underline{2.07 \text{ lb/hr.}}$

Because 2.07 lb/hr, based on annual average, is greater than the screening emissions level (EL) of  $8.0 \times 10^{-4}$  lb/hr for Benzene as listed under IDAPA 58.01.01.586, the facility is required to perform a dispersion model to demonstrate that the Benzene ambient concentration is less than or equal to  $1.2 \times 10^{-1} \mu\text{g/m}^3$  for Benzene.

In such case, the facility needs to complete modeling EI prescribed in the [Idaho Modeling Guideline](#).