



FEDERAL PREVENTION OF SIGNIFICAN DETERIORATION REQUIREMENTS

A Summary of the PSD Workbook: A Practical Guide to Prevention of Significant Deterioration

The goal of the federal Prevention of Significant Deterioration (PSD) program is to ensure that economic growth will occur while protecting clean air, human health and welfare, and air quality in areas where the existing air quality meets the National Ambient Air Quality Standards (NAAQS).

The federal PSD regulations, 40 CFR Part 52.21, are used to implement the federal New Source Review (NSR) program in areas where the measured air quality is cleaner than the NAAQS. Such an area is called an "attainment area," because the air quality attains the goals established by Congress in the Clean Air Act. The PSD regulations require proposed new major sources or major modifications at existing sources to conduct pre-construction air quality monitoring; evaluate the facility's impacts with respect to the NAAQS and the applicable PSD increment concentrations; and to apply the Best Available Control Technology (BACT). Pre-construction monitoring requirements are often waived in favor of existing air quality data from Michigan's air monitoring network. Refer to "Guidelines for Conducting a PSD BACT Analysis" for additional detailed information.

Applicability

PSD applies to new **major sources** and **major modifications** at existing sources. A **major source** is defined as having potential emissions greater than 250 tons per year, or 100 tons per year for sources belonging to one of 28 listed source categories. A **modification** is any physical change or change in the method of operation of the source. A **modification** becomes a **major modification** if it results in both a **significant emissions increase** and a **significant net emissions increase**. A **significant emissions increase** is an emissions increase from the proposed modification that is greater than defined pollutant-specific emission thresholds. A **significant net emissions increase** is the net emissions change from both the proposed modification *and* other recent, qualifying emissions changes made at the entire facility.

In order to determine the magnitude of an emissions increase that will result from a proposed modification there are four different methods that may be used:

1. For modifications that involve only the installation of new emission units, the emissions increase is determined as the difference between the proposed potential emissions (after the modification) and the average annual actual emissions (before the modification). This method is called the **Actual to Potential Applicability Test** and must include all emission units affected by a proposed modification.
2. For modifications that involve only existing emission units, the emissions increase is determined as the difference between the projected future actual emissions (after the modification) and the average annual actual emissions (before the modification). This method is called the **Actual to Projected Actual Applicability Test** and must include all emission units affected by a proposed modification. For modified existing emission units, the **Actual to Potential Applicability Test** may be used as an alternative.
3. For modifications that involve only **Clean Units**, the **Clean Unit Test** is used. For a proposed modification to a Clean Unit that will not cause it to lose its Clean Unit status, the emissions change is zero.
4. For modifications that involve combinations of the previous three types of emission units, the **Hybrid Test** is used. The **Hybrid Test** involves using the appropriate applicability test as described above for each type of emission unit and then adding together the emissions increases.

Refer to Michigan's "PSD Workbook: A Practical Guide to Prevention of Significant Deterioration" for more information on determining PSD applicability; for expanded definitions of any term; or for procedures on using any of the applicability tests.

Best Available Control Technology (BACT)

Best Available Control Technology (**BACT**) means an emission limitation based on the maximum degree of reduction which is achievable taking into account energy, environmental, and economic constraints on the implementation of any particular control option. The **BACT** determination must be site-specific with respect to the project (i.e., the affected emission unit(s)) which is subject to PSD. The evaluation must identify the range

of control options that have been demonstrated for that class or category of source. Control alternatives that may be transferable from other source types or those that are innovative may also be considered.

BACT is implemented in Michigan using a top-down approach. The 5-step methodology for PSD BACT is as follows:

1. Identify all available control options. Available control options are those that have practical potential to the subject equipment for reducing emissions. Control options should include consideration of lower-emitting raw materials; lower-emitting process equipment; or the use of add-on control equipment.
2. Eliminate technically infeasible control options. A control option that has been applied to the same, or similar, source type is assumed to be technically feasible unless source-specific factors exist and are documented to justify otherwise.
3. Rank the remaining control technologies (not eliminated in Step 2) and list them in order of control effectiveness, with the most effective alternative at the top.
4. The top-ranked control option may be further evaluated, and potentially eliminated from further consideration, based on its energy, economic or environmental impact. These evaluations are conducted on a source-specific basis and must demonstrate that the control option would result in unusual or prohibitive impacts at the source under review when compared to other similar sources.
5. The top-ranked control option remaining after Step 4 is selected as BACT.

For more information on conducting a PSD BACT analysis, refer to Michigan's "PSD Workbook: A Practical Guide to Prevention of Significant Deterioration" and "Guidelines for Conduction a PSD BACT Analysis."

PSD Modeling For Criteria Pollutants

An application subject to PSD is required to conduct an air quality analysis to determine the airborne concentrations of criteria pollutants that will be emitted from the proposed new major source or major modification. The resulting airborne concentrations must be less than the allowable **PSD Increments** and must not cause or contribute to a violation of the **NAAQS**. More stringent modeling requirements apply to PSD subject sources locating near a Class I Wilderness Area. These requirements include more stringent **PSD Increments** and analyses for impacts on visibility.

The evaluation of emissions against the **NAAQS** involves modeling the total facility emissions combined with the current measured airborne pollutant concentrations in the vicinity of the source. The source-specific contribution plus the existing background cannot exceed the applicable NAAQS.

The evaluation of emissions against the allowable **PSD Increments** does not include emissions from the whole facility or local background concentrations. This modeling is designed to evaluate the change in local pollutant concentrations to ensure that the proposed new or modified source will not degrade the present air quality by more than an allowable incremental amount.

For more information on conducting PSD modeling, refer to Michigan's "PSD Workbook: A Practical Guide to Prevention of Significant Deterioration" and "Guidelines for Dispersion Modeling."

Additional Impact Analyses

All PSD permits must prepare an additional impact analysis for each pollutant subject to PSD. The analysis must consider the proposed new or modified source's impacts on **growth, soils and vegetation** and **impairment of visibility**. The level of detail for the analysis generally depends on existing air quality, the quantity of emissions, the sensitivity of local soils, vegetation, and visibility in the source's impact area.

For more information on conducting Additional Impact Analyses please refer to Michigan's "PSD Workbook: A Practical Guide to Prevention of Significant Deterioration."

For questions pertaining to this document, contact the AQD Permit Section at 517-373-7074. All referenced guidance documents are available on the AQD Permit Web Page at <http://www.deq.state.mi.us/aps>.