

# Chapter 5: NSR/PSD Permit

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# Chapter 5

## NSR/PSD Permit

### 5.1 Overview

There are several elements not reflected in MPCA Change Forms that must be attached as part of a PSD permit application. These include but are not limited to:

- Control Technology Review
- Source Impact Analysis (ambient air quality analysis)
- Additional Impact Analysis
- Class I Area Impact Analysis
- Environmental review (if required by Minn. Rules)

Each of these is discussed below; however, it is not the intent of this manual to provide guidance on developing a PSD permit application. Please consult the MPCA and USEPA websites for a more detailed discussion.

### 5.2 Control Technology Review from 40 CFR § 52.21(j)

#### BACT Analysis and Report

Major PSD sources which make modifications that exceed the PSD threshold or sources which become major PSD sources must install BACT on the new equipment installed or existing equipment that was modified. (In non-attainment areas, there is a similar requirement to install the lowest achievable emission rate [LAER] technology. However, because all areas in Minnesota are now classified as attainment—or cannot be classified and are treated as attainment—those requirements and the process will not be covered here.)

Determining BACT is a case-by-case “top-down” process. The technology that is the most efficient (produces the lowest emission rate or greatest emission reduction) is considered first. Only if it is economically or technically infeasible to install that particular equipment is the first technology rejected and the second technology considered. The process continues until an economically and technically feasible technology is determined.

This manual is not designed to explain the intricacies of a BACT analysis; its purpose is (1) to alert permit writers and reviewers that changes which are major PSD modifications will require a BACT analysis and (2) to outline the basic requirements and guidance which must be met. The October 1990 USEPA *New Source Review Workshop Manual* (see <http://www.epa.gov/ttn/nsr/gen/wkshpman.pdf>) sets forth a five-step process to determine BACT using the top-down methodology.

## **1) Identify all control technologies**

The first step is to identify all control technologies which can reduce the emissions of the pollutant for which the modification or source is a major PSD modification. If a change at a facility is a major PSD modification for multiple pollutants, this process must be followed for each pollutant. While some technologies may control multiple pollutants, all technologies for each pollutant must be identified.

Sources for technologies to be considered include USEPA's RACT/BACT/LAER Clearinghouse (see <http://cfpub1.epa.gov/rblc/htm/bl02.cfm>). (RACT stands for Reasonably Available Control Technology and is another requirement for non-attainment areas, which will not be covered in this manual.) The RACT/BACT/LAER Clearinghouse is a searchable database which lists control technologies that have been approved by state and local air agencies and the US USEPA as BACT. Other sources for appropriate technologies include vendors, engineering consultants, trade organizations, professional societies (e.g. Air & Waste Management Association or AWMA) and other sources.

## **2) Eliminate technically infeasible options**

For each control technology identified in the first step, determine the control effectiveness (% removal) and emission rate (lbs/hour and tons/year), energy impacts, cost, and installation and operation ramifications. While some information can be obtained from the RACT/BACT/LAER Clearinghouse, engineering consultants and vendors will likely need to be contacted to obtain this information.

Review each technology for the technical feasibility of installing it at the source undergoing the change. This is particularly important for modifications of existing equipment, as there may be physical constraints (e.g. insufficient area, other process equipment in the way) or factors inherent to the process which make it infeasible to install a particular technology on a particular source or emission unit.

## **3) Rank feasible technologies by control efficiencies**

Once the technically infeasible technologies are eliminated, the remaining technologies must be ranked by their control effectiveness (% removal and emission rate) and cost effectiveness (\$/ton removed). Control effectiveness and cost data will need to be obtained from vendors and/or engineering consultants. The impacts on energy (production in the case of electric generators or use for all sources), must also be considered. Other environmental impacts should also be considered (e.g. reductions in other pollutants [such as HAPs], visible plumes from scrubbers, noise). Technologies are ranked from the most effective (highest % reduction or lowest emission rate) to the least effective.

## **4) Evaluate most cost effective controls, select BACT and document**

If the most effective control technology is also the most cost effective (lowest \$/ton), is otherwise feasible, and does not produce any untoward energy or environmental effects, then that technology is BACT. If the most effective technology is not the most cost effective or results in highly negative energy or other environmental impacts, then the next most effective control technology is considered. The most effective option not rejected is considered BACT.

The entire process, including sources for all technologies identified and their characteristics (removal effectiveness, cost, energy, and other environmental impacts), needs to be carefully documented in a BACT report, which is submitted as part of the PSD permit.

## **5) Recommended permit conditions**

The result of the BACT determination will be not only a chosen BACT technology, but also emission limitations which that technology represents. These emission limitations need to be included in Form CD-01 and notation made indicating that they are the result of a BACT determination.

Emission limitations will also lead to requirements for testing (initial and periodic) to show that the BACT is meeting the limitation chosen, monitoring to show that the technology continues to operate as chosen, and reporting and recordkeeping requirements. These requirements also need to be included on Form CD-01.

### **5.3 Source Impact Analysis from 40 CFR § 52.21(k)-(m)**

Because the PSD rules are designed to prevent significant deterioration to ambient air quality that is already meeting the NAAQS, there needs to be a demonstration that this is the case after a proposed change. Two tests are used—modeling and ambient air quality monitoring. As part of the modeling, a source seeking a PSD permit must show that not only will the changes protect ambient air quality and remain beneath the NAAQS, but that the changes will not use up all of the clean air “space” between baseline ambient air concentrations and the allowable increase (the increment). All of these requirements are discussed in general below.

As with the BACT analysis, detailed information on the intricacies of a PSD air quality analysis can be found elsewhere. The purpose of this manual is to inform permit writers and reviewers that changes which are major PSD modifications may require an air quality analysis and to outline the basic requirements and guidance which must be met.

#### **5.3.1. Pre-Application Ambient Air Monitoring**

By rule, four consecutive quarters of ambient air quality monitoring for the pollutant for which a project/source is a major PSD source is required prior to applying for a major PSD permit. Such monitoring must occur within reasonable proximity of the source. However, this has seldom been required, and sometimes MPCA ambient monitoring will be sufficient. For those pollutants for which the NAAQS are regional (e.g. ozone), no localized monitoring is required. Thus, a source which is a major modification for VOC does not require ambient air quality modeling.

More often, sources which do not produce a significant impact on ambient air quality levels may petition, as part of the PSD permit application, for a waiver from conducting ambient air quality monitoring. Modeling, often screening modeling, which demonstrates that the impacts from the proposed change are below the Significant Impact Levels (SILs), are usually a sufficient demonstration that the requirements for pre-application monitoring are waived by the MPCA and/or USEPA.

Sources sometimes limit emissions from certain emission units to demonstrate that the impacts are below the SILs. Note that these limitations should also be included on Form CD-01, along with requisite testing, monitoring, reporting and recordkeeping requirements to show that the limitations are being met.

### **5.3.2. Modeling to demonstrate protection of the NAAQS**

The basics of modeling are discussed in Chapter 8. The modeling must demonstrate that the ambient impact of all of the emission units at a source which emit the pollutant for which a PSD permit is being sought (including emission units which are not undergoing any change)—as well as emissions from nearby stationary sources plus background—meets the ambient air quality standards for that pollutant. As with the SIL, sources will sometimes limit emissions from certain emission units to make a demonstration that the impacts are below the NAAQS. Note that these limitations should also be included on Form CD-01, along with requisite testing, monitoring, reporting, and recordkeeping requirements to show that the limitations are being met.

### **5.3.3. Modeling to demonstrate protection of the increment**

If a baseline concentration is already established in the immediate area for the pollutant for which a major PSD permit is being requested, then modeling must also show that the proposed change will not use up all of the increment. The source will only be allowed a certain amount of impact above the baseline concentration in the surrounding air. For each pollutant, the PSD regulations set an acceptable increase of ambient concentrations above the baseline concentration, also known as the increment. This modeling is similar to the NAAQS modeling discussed above but there are subtle differences, discussed in Chapter 8.

If a baseline concentration has not been established in the immediate area for the pollutant for which a major PSD permit is being requested, then the baseline emissions, date and area must be defined before the increment analysis can occur. Establishing the baseline can be difficult, and the MPCA needs to be consulted early on and be involved in the establishment of the baseline, as does the USEPA.

As with the BACT analysis, the entire process, including sources for data, assumptions and calculations made, and results must be summarized in a Technical Support Document (TSD), which is submitted as part of the major PSD Permit Application. See Chapter 8 for more information on TSDs.

## **5.4 Source Information from 40 CFR § 52.21(n)**

Federal regulations in 40 CFR § 52.21(n) detail the information about the source which a PSD permit must contain. Most of this information is contained in the MPCA Change Forms as noted above. In addition, however, a source must include the BACT analysis and the source impact analysis discussed above. One other piece of information which must be included that is not on the MPCA forms is the schedule for construction, including the start of construction and start of operation.

## **5.5 Additional Impact Analysis from 40 CFR § 52.21(o)**

In addition to the impacts on ambient air quality discussed above, some facilities may be required to determine the impact of emissions on air quality related values (AQRVs), including soils and vegetations and visibility. In practice, this is quite uncommon and generally limited to construction of very large sources (e.g. a new coal fired power plant). Visibility is discussed in Section 1.5 below.

If a source is located within 50 miles of a state border, a neighboring state can request that modeling be conducted to show the impact on ambient air quality in the neighboring state(s). Since most air quality

modeling focuses on areas near the source (within 5 or 10 kilometers), a different receptor grid is usually established to determine impacts on air quality in neighboring states, and such requests are rare. The MPCA will provide specific notice and opportunity to comment to neighboring states or Canadian provinces.

## **5.6 Class I Area Impact Analyses from 40 CFR § 52.21(p)**

The three Class I areas that may impact Minnesota sources are the Boundary Waters Canoe Area (BWCA) and Voyageurs National Park (VNP) in Minnesota and the Rainbow Lake area in Wisconsin. Both the BWCA and VNP have established Air Quality Related Values (AQRVs). Modeling for visibility impairment may need to be conducted depending on the size of the source and its distance from the Class I area. Guidance is provided on the MPCA's and USEPA's websites and is discussed more in Chapter 8.

As with the ambient air quality analysis discussed above, the entire process, including sources for data, assumptions and calculations made, and results must be summarized in a Technical Support Document (TSD), which is submitted as part of the major PSD permit application.

## **5.7 Public Participation from 40 CFR § 52.21(q)**

Federal regulations in 40 CFR § 52.21(q) require that the public be afforded the opportunity to comment on any proposed PSD permit. Because a PSD permit is a major permit amendment, and a Title I amendment, the MPCA automatically provides such an opportunity as part of the permit process. MPCA will also provide specific notice to any Federal Land Managers whose areas may be affected by a facility and any neighboring states or Canadian provinces for sources within 50 miles of the border.

## **5.8 Approval to construct from 40 CFR § 52.21(r)**

Construction of a new source, or modifications to an existing source which require a PSD permit, cannot begin until the permit has been issued. (Note that the definition of what constitutes "begin construction" is covered in 40 CFR § 52.21(b) and allows some minor site preparation work, at the sources' risk, prior to permit issuance).

Sources should also be aware, as discussed below, that USEPA may object to a PSD permit after the permit has been issued by the MPCA. Although rare, USEPA has exercised its oversight authority, and that authority has been recently upheld by the US Supreme Court.

## **5.9 Environmental Impact Statement from 40 CFR § 52.21(s)**

Federal rules require that an environmental impact statement be completed if the thresholds in the National Environmental Policy Act (NEPA) are triggered. However, Minnesota had its own Minnesota Environmental Policy Act (MEPA) prior to the enactment of the federal law, and environmental review is governed by Minnesota requirements. Sources which are subject to federal (NEPA) review are those that are owned and operated by the federal government, predominantly funded by federal grants, and in some cases, projects by or for Native American tribes and/or bands. All other projects are subject to Minnesota (MEPA) review.

A PSD permit does not automatically trigger environmental review under either state or federal regulations. For example, a source which had a project with an emissions increase of 50 tpy of NOx would trigger a major PSD permit amendment but not an environmental review, because in Minnesota the threshold for mandatory environmental review is 100 tpy. Conversely, a facility which added a tank over one million gallons storing regulated materials could have emissions well under the 25 tpy VOC threshold for PSD yet could trigger a mandatory review because of a MEPA threshold for tanks of that size, regardless of air emissions.

See Chapter 9 for more discussion of the requirements for environmental review in Minnesota.

## **5.10 PSD Permit Issuance Process**

The process for issuance of a major PSD permit is similar to the process for a major permit amendment (a major PSD permit is a major amendment for existing sources). Once a completed permit application is reviewed by the MPCA, a draft permit is provided to the source. Once the terms and conditions of the permit have been negotiated, the permit is put on public notice, typically for 30 days.

It is during the public notice and comment period that there are additional steps. Nearby Federal Land Managers of Class I areas are notified specifically, so that they can confirm that impacts to the Class I areas are minimized. If the source is within 50 miles of a neighboring state or Canada, the state or provincial air quality agency will also be notified, so that they can have notice of potential impacts in their jurisdiction.

USEPA maintains oversight of the Minnesota PSD program and will be provided a copy of the permit as part of the public notice and comment period. However, USEPA, as part of its oversight authority, can object to the permit terms and conditions. If USEPA objects during the public comment period (or the USEPA review period) and the MPCA does not address USEPA's comments, the federal agency may file suit after the permit has issued and can require that terms and conditions be modified by the MPCA.

### **PSD Permit Requirements**

Similar to other federal standards of performance, a PSD permit will generate emission limitations or work practices as a result of the BACT analysis or the air quality analysis. These limitations, together with requisite testing, monitoring, recordkeeping, and reporting requirements, need to be incorporated into the Form CD-01.

In the Blue Ox Woodworking example in Chapter 11, the BACT limitation for the new boiler will be a pound/hour limitation and the air quality analysis yields a ton/year limitation to comply with NAAQS. (Note that the pound/hour limitation may be different than the ton/year limitation divided by 8,760 hours/year). Blue Ox has chosen to use a NOx CEM (or was required to under the NSPS that was triggered) and so will do an initial performance test which will also serve as a certification test for the NOx CEM. An annual RATA for the CEM will provide for an annual test on emissions as well as the continuous monitoring provided by the CEM. The NSPS provides sufficient detail in reporting and recordkeeping that additional reports and records are not necessary for PSD purposes.