

PREVENTION OF SIGNIFICANT DETERIORATION (PSD) PERMITS

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INTRODUCTION:

REGULATORY/ TECHNICAL BACKGROUND

PSD AND NONATTAINMENT PERMITTING REQUIREMENTS WERE CREATED BY THE 1977 FEDERAL CLEAN AIR ACT (FCAA) AMENDMENTS. THE FEDERAL REGULATIONS IMPLEMENTING THESE PERMITTING PROGRAMS WERE FINALIZED AFTER COURT CHALLENGES ON AUGUST 7, 1980, AND HAVE REMAINED IN EFFECT WITH MINOR REVISIONS UNTIL NOW. UNDER THESE RULES, NEW MAJOR STATIONARY SOURCES OF AIR POLLUTION AND MAJOR MODIFICATIONS TO EXISTING MAJOR STATIONARY SOURCES ARE REQUIRED TO OBTAIN AN AIR POLLUTION PERMIT BEFORE COMMENCING CONSTRUCTION. THIS PROCESS, CALLED NEW SOURCE REVIEW (NSR), IS REQUIRED WHETHER THE MAJOR SOURCE OR MODIFICATION IS PLANNED FOR AN AREA WHERE THE NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS) ARE EXCEEDED (NONATTAINMENT AREAS) OR AN AREA WHERE AIR QUALITY IS ACCEPTABLE (ATTAINMENT AND UNCLASSIFIABLE AREAS). PERMITS FOR SOURCES IN ATTAINMENT AREAS ARE REFERRED TO AS PSD PERMITS, WHILE PERMITS FOR SOURCES LOCATED IN NONATTAINMENT AREAS ARE REFERRED TO AS NONATTAINMENT AREA (NAA) PERMITS. THE ENTIRE PROGRAM, INCLUDING BOTH PSD AND NAA PERMIT REVIEWS, IS REFERRED TO AS THE NSR PERMITTING PROGRAM.

In order to trigger PSD permitting requirements, the proposed project must be a major stationary source or a major modification. A stationary source is any source type belonging to a list of 28 source categories that emits or has the potential to emit 100

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tons per year or more of any pollutant regulated under the FCAA, or any other source type that emits or has the potential to emit 250 tons per year or more. If a source is determined to be major for any regulated pollutant, it is considered major for all. A stationary source generally includes all pollutant-emitting activities that belong to the same industrial grouping, are located on contiguous or adjacent properties, and are under common ownership or control.

PSD SOURCE CATEGORIES

1. Coal cleaning plants (with thermal dryers)
2. Kraft pulp mills
3. Portland cement plants
4. Primary zinc smelters
5. Iron and steel mills
6. Primary aluminum ore reduction plants
7. Primary copper smelters
8. Municipal incinerators capable of charging
9. Hydrofluoric acid plants
10. Sulfuric acid plants
11. Nitric acid plants
12. Petroleum refineries
13. Lime plants
14. Phosphate rock processing plants
15. Coke oven batteries
16. Sulfur recovery plants
17. Carbon black plants (furnace process)
18. Primary lead smelters
19. Fuel conversion plants
20. Sintering plants
21. Secondary metal production plants
22. Chemical process plants more than 250 tons/day of refuse
23. Petroleum storage and transfer units with a total capacity more than 300,000 barrels
24. Taconite ore processing plants
25. Glass fiber processing plants
26. Charcoal production plants
27. Fossil fuel-fired steam electric plants of more than 250 MMBTU/hr heat input
28. Fossil fuel-fired boilers totaling more than 250 MMBTU/hr heat input

If a proposed project is an above-listed source and emissions exceed 100 tpy of any regulated pollutant, or if it is an unlisted source whose emissions exceed 250 tpy of a regulated pollutant, then PSD permit requirements are triggered.

OUR SERVICES AND APPROACH:

HOW SAGE HELPS CLIENTS MEET REQUIREMENTS

PSD permitting is a complex and protracted process that Sage helps navigate.

MAJOR MODIFICATIONS

A major modification is generally a physical change or change in the method of operation of a major stationary source that would result in a significant net increase in the emission of any regulated pollutant. In determining if a proposed project increase would cause a significant net increase to occur, Sage makes several calculations.

OUR SERVICES AND APPROACH:

HOW SAGE HELPS CLIENTS MEET REQUIREMENTS

First, we determine the proposed project emissions, typically the potential to emit (PTE). Project emissions include emissions from any new equipment or emission increases from any changes to existing equipment, debottlenecking of any up-stream or down-stream equipment, or any increased utilization of support facilities such as boilers. We then determine the baseline actual emissions, which is the highest average actual emission rate over any consecutive 24-month period in the previous ten years for the facility being modified (for utilities, it's the previous 5 years). If the difference between the baseline actual emissions and the project emissions exceed any of the PSD significance levels, then PSD permitting is triggered or a contemporaneous netting calculation can be made in order to net out of PSD permitting. This is a critical step in PSD permit applicability. It is very beneficial to net out of PSD if possible.

To do the netting calculations, we first determine the contemporaneous period, which is defined as five years back from the proposed start of construction date, forward to the proposed start of operation date. The time between these two dates is the contemporaneous period. Second, we define all creditable emission increases and decreases that have or will occur in the contemporaneous period. Creditable increases are the project emissions plus all authorized emission increases in the contemporaneous period. Creditable decreases are all emission decreases that exceed the State Implementation Plan (SIP) requirements that occurred during the contemporaneous period. Third, we sum all the creditable increases and decreases in the contemporaneous period and compare the result to the PSD major modification significance levels. If the calculated net increase exceeds the significance levels, PSD permitting is triggered.

PSD MAJOR MODIFICATION SIGNIFICANCE LEVELS

NOx	40 tpy	Fluorides	3 tpy
SOx	40 tpy	Sulfuric Acid Mist	7 tpy
VOC	40 tpy	Hydrogen Sulfide	10 tpy
CO	100 tpy	Total Reduced Sulfur	10 tpy
Lead	0.6 tpy		
PM10	15 tpy		
PM2.5	10 tpy		
CO2	75,000 tpy		

PSD PERMIT APPLICATION

If PSD permitting cannot be avoided, then a PSD permit application must be prepared. Most companies need assistance in the preparation of a PSD permit application. Sage routinely assists clients in preparing these permit applications.

OUR SERVICES AND APPROACH:

HOW SAGE HELPS CLIENTS MEET REQUIREMENTS

The PSD permit application requires four demonstrations in order for the permit to be issued: 1) the applicant proposes the installation of best available control technology (BACT), 2) an air quality impact analysis demonstrates that no PSD increments will be exceeded, 3) an additional impacts analysis demonstrates that there will be no significant impacts to soils, vegetation, and visibility, 4) you provide adequate public notice and the opportunity for public participation. Sage helps with each of these demonstrations.

1) BACT DETERMINATION

The EPA requires that BACT be determined by a top-down BACT analysis. The steps in performing this analysis are as follows:

STEP 1 Identify all potential available control technologies. Available control options are those air pollution control technologies with a practical potential for application to the proposed equipment and the regulated pollutant under review. This includes technologies employed outside the United States. Air pollution control technologies include the application of processes or available methods, systems, and techniques, including fuel cleaning or innovative fuel combustion techniques for control of the affected pollutant. Sage identifies all control technology options (using the U.S. EPA BACT/MACT/LAER clearinghouse, if necessary).

STEP 2 Eliminate the technically infeasible options. We evaluate the technical feasibility of the control options identified in Step 1 with respect to the source-specific (or project specific) factors. In general, a demonstration of technical infeasibility should be clearly documented and should show, based on physical, chemical, and engineering principles, that difficulties would preclude the successful use of the control option on the proposed project equipment under review. We eliminate technically infeasible control options from further consideration in the BACT analysis.

STEP 3 Rank the remaining control technologies by control effectiveness in descending order. We rank all remaining control alternatives not eliminated in Step 2 and list them in order of overall control effectiveness for the pollutant under review, with the most effective control alternative at the top. We also prepare a list for each pollutant for which the proposed project is subject to BACT analysis. The list presents an array of control technology alternatives and includes the following types of information:

1. Control efficiencies
2. Expected emission rate
3. Expected emission reduction
4. Environmental impacts
5. Energy impacts
6. Economic impacts

STEP 4 Evaluate the list of control options and document the results. For each option, we conduct an objective analysis. We discuss and quantify, where possible, both beneficial and adverse impacts of each option. In general, our BACT analysis focuses on the direct impact of each control alternative. In the event that the top candidate is shown to be inappropriate due to energy, environmental, or economic impacts, we document the rationale for this finding in the permit application. The next most stringent alternative on the list then becomes the new control candidate and is similarly evaluated. This process continues until the technology cannot be eliminated.

STEP 5 **Select the BACT option.** The most effective control option not eliminated in Step 4 is selected as BACT for the proposed project to control the pollutant under review.

2) AIR QUALITY IMPACT ANALYSIS

The purpose of the air quality impact analysis is to demonstrate that the new or increased emissions from the proposed project, in conjunction with other applicable emissions increases and decreases from existing sources, will not cause or contribute to a violation of any applicable NAAQS or PSD increment or adversely impact a Class 1 area. The analysis involves an assessment of existing air quality, which may include ambient air monitoring data, and dispersion modeling predictions of ambient air concentrations that will result from the emissions from proposed project and other air emissions sources in the area.

A PSD increment is the amount of pollution in an area that is allowed to increase from new emissions growth. PSD increments prevent the air quality in a clean area to deteriorate to the level set by the NAAQS. Class 1 areas are areas of special national or regional natural, scenic, recreational, or historic value for which the PSD regulations provide special protection.

Sage is uniquely staffed with expert modelers who are thoroughly familiar with modeling protocols required by the reviewing agency. This modeling exercise defines the impact of the proposed project on the ambient air quality in the area and calculates the PSD increment consumption by the project. Sage works with the client at every step to ensure that all calculations are correct and the modeling is acceptable to the reviewing agency.

3) ADDITIONAL IMPACTS ANALYSIS

This section of the PSD permit application assesses the impacts of air, ground, and water pollution on soils, vegetation, and visibility caused by any increase in emissions of any regulated pollutant from the proposed project under review and from associated growth. Associated growth is industrial, commercial, and residential growth that will occur in the area due to the proposed project. The EPA has not issued detailed guidelines describing how the additional impacts analysis should be conducted. Instead, boilerplate language, acceptable to EPA, has been developed and is used in each application.

4) PUBLIC NOTICE

The PSD rules require that before a PSD permit is issued, adequate opportunity for public involvement must be made. This is done through the public notice and comment procedures. Each reviewing authority has adopted regulations specifying the public notice procedures, which include newspaper notice, posting of signs at the proposed site, and procedures for receiving public comment, including public hearing procedures. The process is agency-driven, and the permit applicant is required to follow the specific public notice procedures as directed by the reviewing agency.

OUR SERVICES AND APPROACH:

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ADMINISTRATIVE DATA

There are other parts to the PSD permit application that Sage prepares. Such administrative data includes facility location information and maps, process flow diagrams, records of permits issued and emission control projects at other units, and any other items as required by the reviewing agency. Sage coordinates with the facility and the reviewing agency to incorporate all relevant documentation within the permit application. Sage also proposes special conditions language for the final permit to provide the client with maximum operating flexibility while maintaining compliance with all regulations.

TIMING/PROCESS

PSD permit application reviews can take 6-12 months or longer depending upon EPA and citizen involvement in the public notice period. Sage assists in negotiating permit conditions and works with the reviewing agency to compress the timelines in the review process. We generally require 1-3 months to prepare a PSD application depending upon the size and complexity of the proposed project and the availability of the required permit application data requirements.

SUMMARY:

SAGE'S SERVICES FOR PSD PERMITTING

Sage is uniquely qualified to provide turnkey services for the PSD permitting process. We help clients avoid PSD permitting altogether by developing strategic project timelines, pollution reduction projects, and innovative netting approaches. If PSD permitting is triggered, Sage prepares the permit application and shepherds the application through the review process consistent with client deadlines and regulatory compliance.