A Summary of the EPA Instructions
For Conducting a BACT Analysis

Top-down BACT consists of the following 5 step process:

Step 1 – Identify all control technologies
Step 2 – Eliminate technically infeasible options
Step 3 – Rank remaining control technologies by control effectiveness
Step 4 – Evaluate most effective controls and document results
Step 5 – Select BACT

NOTE – Additional guidance for conducting a top-down BACT analysis can be found in the DRAFT New Source Review Workshop Manual – Prevention of Significant Deterioration and Nonattainment Permitting dated October 1990 located at the following link:
http://www.epa.gov/region07/air/nsr/nsrmemos/1990wman.pdf

I. General Requirements

A. Best Available Control Technology (BACT) means an emission limitation (including opacity limits) based on the maximum degree of reduction which is achievable for each pollutant, taking into account energy, environmental, and economic impacts, and other costs.

B. The analysis must be pollutant and emission unit specific with respect to each pollutant subject to a BACT review.

C. Evaluate entire range of demonstrated options, including alternatives that may be transferable or innovative.

D. The level of detail in the control options analysis should vary with the relative magnitude of the emissions reduction achievable. The permitting agency should not develop the BACT analysis for the applicant.

E. Emission limits should be expressed in pounds/hour (based on maximum capacity) and in terms of process unit variables such as material processed, fuel consumed or pollutant concentrations (e.g., lbs/1mm BTU, lbs/gal of solids applied, g/dscm).

F. Emission limits and work practice standards must be enforceable. Permit conditions should specify appropriate stack testing, continuous emission monitoring, continuous process monitors, recordkeeping, etc.

II. Procedure

A: Pollutant Applicability
Determine which regulated pollutants are emitted in significant quantities, including fugitive emissions. Regulated pollutants include all pollutants regulated by National Ambient Air Quality Standards (NAAQS), New Source Performance Standards (NSPS), and National Emission Standards for Hazardous Air Pollutants (NESHAPS). Pollutants which fall into two categories must be accumulated in each category (e.g., Dimethyl Sulfide is a reduced sulfur compound and a VOC). **NOTE:** This step is necessary only when doing a Prevention of Significant Deterioration (PSD) BACT review.

B: Emission Unit Applicability

Determine all potential emission units including fugitive units (e.g., each stack, relief valves, pumps, storage piles or tanks, conveyors, valves, etc.)

C: Potential Sensitive Concerns

Identify any potentially sensitive concerns involving energy, economic, and environmental issues. All potentially sensitive air quality concerns (including the control of all non-criteria pollutants) should apply specifically to the case under review (e.g., limestone may have to be injected upstream of a baghouse to control hydrogen chloride even though it is not a criteria pollutant).

D: Selection of Alternative Control Strategies

1) Determine base case. The base case is the control strategy that, in the absence of BACT decision making, would normally have been applied.

2) Identify all alternative control strategies affording greater control, including (a) transferable and innovative control technologies, (b) processes that inherently produce less pollution, and (c) various configurations of same technology which achieve different control efficiencies (e.g., one field and five field electrostatic precipitations or 95% and 99% efficient scrubber). All of the following sources of information would generally need to be investigated to ensure that all possible control strategies are identified.

a. Literature
b. Industrial surveys
c. RACT/BACT/LAER Clearinghouse (RBLC)
d. EPA/State/Local air pollution control agency surveys.

E: Impact Analysis

Determine if the most efficient alternative is not feasible because of energy, economic or environmental impacts or other costs. If necessary, continue evaluating the less efficient technologies. BACT is the most efficient alternative which is not demonstrated to be infeasible. The following are examples when energy, economic, or environmental impacts may make an alternative not feasible.

1) Energy - Natural gas for operating an afterburner not available based on local regulations.

2) Economic

i) The increased cost of the final product (e.g., automobile, cement, coke, etc.) would increase to a level that the project would no longer be feasible.

ii) The increased cost is way out of proportion to the environmental benefit. (e.g., the increased cost of going from 93% to 94% control increases the capital cost from $2,000,000 to $4,000,000 and the operating costs from $500,000/year to $1,000,000/year and only reduces the emissions of nitrogen oxides by 50 tons per year.)

3) Environmental -- A wet scrubber may create a by-product which cannot be disposed of without creating a more detrimental impact.

F: Permit Requirements

Establish emission limits with reasonable margin of safety (e.g., 95% confidence level of available test data); establish averaging time if necessary; and establish stack testing, continuous emission monitoring, recordkeeping, and reporting requirements.