

PSD
APPLICATION
GUIDANCE

Contents

Foreword	4
I. PSD OVERVIEW	5
II. Major Stationary Sources	6
Single Source Determination	6
Stationary Source Emission calculation	6
III. Preliminary Efforts	8
Dispersion Modeling Protocol	8
Preconstruction Monitoring	8
Soils and Vegetation Inventory	9
IV. PERMITTING PROCESS OVERVIEW	10
PSD Application Checklist	10
Pre-Application Meeting	10
Submittal of Complete Application	11
Confidentiality	11
Project Review and Issuance of Permit(s)	12
V. PSD APPLICATION ELEMENTS	13
Significant Net Emissions Elements	13
Baseline Actual Emissions	13
Potential to Emit Calculations	13
Net emissions increase for the project	14
Fugitive and exempt emissions	14
Associated emissions increases	14
Documentation to support emission calculations	14
Projected Actual Emissions	14
Source-wide Net Emission Changes (Netting)	15
BACT Analysis	15
Top-down BACT analysis	16
Technology transfer	16
Technically feasible	16

Rank remaining technologies in order of effectiveness.	17
Evaluate most effective controls and document results	17
Economic impacts.....	17
Energy impacts	18
Environmental impacts.....	19
Select BACT.....	20
Additional Impact Analyses	20
Visibility impacts	20
Soils and Vegetation impacts.....	20
Growth impacts.....	21
Proposed Permit Conditions	21
Required Application Forms	21
Facility Information (Form FI).....	22
Construction Permit Application Fee (Form AF)	22
Application Cover Page (Form CP).....	22
Emission Inventory (Form EI).....	22
Emission Unit Information Forms EU, EU1 through EU5	23
Control Equipment (Form CE, CE1 through CE6).....	23
Emission Point (Stack/Vent Information) (Form EP).....	23
Emission Calculations (Form EC)	24
Form MI1	24
Form MI2	24
GHG.....	24
VI. DISPERSION MODELING ANALYSIS.....	24
VII. VI. ADDITIONAL RESOURCES	25

Foreword

The Department issues individual Air Quality Construction Permits for each emission point in the project. Each permit addresses all emission units venting to that emission point. All permits will be issued simultaneously at the completion of the project review. The Department also issues single emission unit permits which address all pollutants and all air quality programs to which that unit is subject. This can result in permits that include NSPS, NESHAP and state permitting rule requirements in addition to PSD related requirements. It is frequently the case that these other air quality programs add requirements not necessary for PSD permitting. Still the timing of permit issuance is often set by PSD program requirements because of the relative complexity of the PSD program.

This document is to provide guidance for any Prevention of Significant Deterioration (PSD) or Ethanol Greenfield Projects submitted to the Department. The Department anticipates completing the project within 180 calendar days of receipt of the final complete application **if the applicant submits the project according to this guidance.**

Again this document is solely intended as guidance. This document addresses the more common issues that arise during permitting reviews. It is not a complete description of the PSD program. During the case-by-case review inherent in PSD permitting site-specific factors and changes in regulations and guidance may affect the scope of that review, and the determinations in that review, that are not addressed in this document or that may be in conflict with this document.

I. PSD OVERVIEW

Before construction, *new major stationary sources* and *major modifications* to existing major stationary sources are required to obtain a construction permit under the New Source Review (*NSR*) provisions of the Clean Air Act (*CAA*). Construction activities before obtaining a permit is a violation of State [455B.134 (3) (a) CoI] and Federal [Section 165 of the Clean Air Act] Laws and Departmental rules [567 IAC 21.1(1) (b) and 567 IAC 33.3(2) (b)].

The PSD review is conducted on a pollutant-by-pollutant basis. In attainment and unclassifiable areas the relevant federal NSR program is the Prevention of Significant Deterioration (*PSD*) program set forth in Part C of the Clean Air Act (Section 160 through 169B). Iowa operates this program under an approved State Implementation Plan (*SIP*). The Iowa PSD rules are located in Chapter 33 of the Department's rules (567 IAC 33).

The goals of the PSD program are to protect human health and welfare while ensuring that economic growth can continue. This is to be achieved while preserving local air quality and protecting areas of special value, such as national parks and wilderness areas, also known as Class I areas. Finally there must be opportunity for participation in the decision making process by an informed public.

These goals are accomplished by reviewing PSD applications to ensure they comply with the National Ambient Air Quality Standards (*NAAQS*), the applicable PSD *increment* concentrations, and the requirement to apply Best Available Control Technology (*BACT*) as well as evaluating *visibility impacts*, *energy and environmental impacts*, *soils and vegetation impacts*, and *growth impacts*. This review is conducted on a pollutant by pollutant basis.

The State of Iowa issues separate Air Quality Construction Permits for individual units as opposed to single permits for projects or stationary sources. This can result in the issuance of a number of permits for a single PSD project reflecting how many individual emission points are involved in that project. The permit for each individual emission point does, however, address all the contaminants and all air quality programs or standards which apply to the units connected to that emission point. Permits could include New Source Performance Standards (*NSPS*), National Emission Standards for Hazardous Air Pollutants (*NESHAP*), and Maximum Available Control Technology (*MACT*) standards, limits to protect ambient air quality as well as state permitting rules such as limits to protect ambient air quality standards and even minor source requirements as appropriate.

The Department issues all PSD permits in the State. However, Linn County performs the application review and drafts the PSD permit which is subsequently issued by the Department. In addition plants located in Polk County need to obtain non--PSD permits from that program. Local program websites are:

Linn County: <http://www.linncleanair.org/>

Polk County: <http://www.polkcountyiowa.gov/airquality/>

The Iowa Department of Natural Resources Air Quality Bureau (*Department*) does charge fees for construction permitting, see Form AF for additional information about construction permitting fees. Construction permitting is a separate program from the Title V Operating Permit program under the *CAA*.

II. MAJOR STATIONARY SOURCES

PSD requirements only apply to major stationary sources or projects that would be a major stationary source by themselves. The very first issue to be addressed is whether or not the project involves a major stationary source. That determination involves two steps. Determining what constitutes the stationary source for PSD purposes and then determining the total emission from that stationary source.

Single Source Determination

Operations that might otherwise be considered to be separate operations may still be considered to be parts of the same facility (stationary source) for PSD review. This is a case-by-case determination which depends on the particular details of each situation.

Three criteria are used to make the single source determination:

- 1) The facility is contiguous or adjacent to the principal plant
- 2) Shares the same industrial grouping, and
- 3) Is under common control.

None of these criteria are as straightforward as they first seem. What is adjacent depends on how closely integrated the operations are. Industrial grouping depends on the primary activity of the group rather than on the ability to subcategorize different operations in the production process. Common control includes common ownership but also includes contractual relationships and even operational dependency on the “other” operation.

In all three cases the determination depends, in part, on the degree of integration between the facilities. The more closely integrated the operations the more likely more remote more distinctly owned operations will be classified as a single source for purposed of PSD review. Previous determinations are used to maintain as much consistency as possible given the case-by-case nature of the determination. Various EPA documents are used as guidance. The largest single depository of these documents can be found on EPA’s Region 7 web site at <http://www.epa.gov/caa-permitting/caa-permitting-epa-region-7-midwest>. All determinations are unique. As with most case-by-case determinations, changing conditions as well as new decisions made elsewhere can result in different decisions or can change a previous determination.

This is a Departmental determination. You should seek clarification from the Department if there is any uncertainty about any production activity at another location or the use of production resources from another location. If other locations get incorporated in the project during review, it could significantly complicate that review. It is far better to be forewarned.

Stationary Source Emission calculation

If the stationary source is a major stationary source then any major modification becomes subject to PSD permitting.

There are twenty-eight source categories listed in the definition of major stationary source. For these twenty-eight categories that become major if there is a potential 100 tons or more of any regulated NSR

pollutant in a year including any fugitive emissions. This same calculation is used if the source category was subject to NSPS or NESHAP standards as of August 7, 1980.

Any other stationary source becomes a major stationary source if it has the potential to emit more than 250 tons of any regulated pollutant in a year. Fugitive emissions are not used in the major stationary source calculation for these sources.

III. PRELIMINARY EFFORTS

There are three activities that have the potential to delay application development so much that they should be addressed just as soon as the potential applicant decides that they will be proceeding with a particular project.

Dispersion Modeling Protocol

It is particularly important to establish the dispersion modeling protocol early in the process because dispersion modeling is such a major factor in so many of the decisions associated with the review of a PSD.

Guidance in developing this modeling protocol can be found on the DNR web pages at <http://www.iowadnr.gov/Environmental-Protection/Air-Quality/Modeling/Dispersion-Modeling>

Preconstruction Monitoring

Preconstruction monitoring is required for each pollutant subject to PSD review. This can be satisfied in several methods: use of private air monitoring for at least one year, use of existing Department air data, or modeling below significant monitoring levels. This is based on the requirements of 40 CFR 52.21(m).

Prior to reviewing the PSD application checklist and filling out applications, your company needs to determine if pre-construction monitoring is required.

This determination is made by dispersion modeling the projected impacts of the project. The criteria for this can be found at 40CFR 52.21(i) (5) (i). Unless you can demonstrate that your impact is less than these modeling criteria you will have to present preconstruction monitoring data. If either the predicted ambient impact or existing ambient pollutant concentrations are less than the prescribed significant monitoring value, the Department may exempt the applicant from preconstruction monitoring. For details, contact the permit engineer assigned to the project.

If ambient air monitoring is required, at least one year of air quality data should be used that represents the period immediately prior to the PSD application submittal date for any criteria pollutant that the applicant proposes to emit in significant amounts.

You may be able to use the Department's existing monitoring. To use Departmental monitoring data you must get approval from the Department that the data is representative of the area impacted by the proposed project.

Data from the Departmental air monitoring sites may be used. It is found at: <http://www.iowadnr.gov/Environmental-Protection/Air-Quality/Monitoring-Ambient-Air>

If using Departmental monitoring data, there is no need to supply quality assurance documentation. If the Departmental data cannot be utilized, your company will need to operate a site-specific air monitoring network. In this case, applicants will need to submit quality assurance documentation for the monitoring results and siting location for approval. See the links at the end of this document for more detail.

Soils and Vegetation Inventory

The soils and vegetation analysis requires an inventory of both commercial cropping in the area and also vegetation and soils (read ecologies) that could be impacted by emissions from the project.

Developing the inventory can take some time and might even require field work during the growing season since this involves accessing of cropping information as well as a field survey of areas of (even marginal) recreational benefit.

Publicly owned recreational areas can be identified by selecting the Recreation Map on the Department's Interactive Mapping (GIS) site (<http://www.iowadnr.gov/Conservation/Threatened-Endangered>). Although this is not a complete inventory of locations of recreational significance, these are generally the highest value recreational areas in the vicinity. Also of concern are trails, scenic drives, and aquatic recreation resources as well as privately held lands that are used for recreational or preservation purposes. County conservation officers are a good source for identifying these areas.

Similarly state and federal endangered species located within a county can be found by accessing the Natural Areas Inventory Interactive Website on the Department's Interactive Mapping (GIS) site (<http://www.iowadnr.gov/Conservation/Threatened-Endangered>). Specific townships within each county where federally endangered plants are located can be found on the Iowa Department of Agriculture and Land Stewardship Pesticide Bureau web site (http://www.iowaagriculture.gov/Pesticide/endangered_species.asp).

Using this inventory is discussed in the permitting process.

IV. PERMITTING PROCESS OVERVIEW

PSD Application Checklist

Before undertaking a PSD project, please review the PSD Application Checklist. The checklist is located at: <http://www.iowadnr.gov/Environmental-Protection/Air-Quality/Construction-Permits/Construction-Permitting-Materials>.

This guidance document explains in detail each item found on the checklist.

Pre-Application Meeting

Many more questions seem to arise in almost all PSD applications where the application does not coordinate the development of the application with the Department. If the applicant wants to speed the Department's review of their application they are strongly advised to request a pre-application meeting with the Department to outline the project. The Environmental Protection Agency (EPA) regional office (Region VII) is invited as well.

This meeting is used to discuss the status of dispersion modeling, preconstruction monitoring, and BACT analysis. Also to be discussed is whether this will be a phased project, communication strategies and expectations, and setting of a project schedule. At least two weeks before the meeting, an application that is at least "80 percent complete" and an agenda outlining the meeting is to be submitted to the Department for review.

By "80 percent complete" the Department means that all major components of a PSD application should be drafted even though subject to change and without completed documentation. This draft needs to include

- complete forms associated with the project (see Section IV)
- preliminary drafts of the various components of the BACT determinations including
 - identification of available technologies,
 - their feasibility,
 - their environmental energy and economic impacts including annual average cost calculations (and, if relevant, annual incremental cost calculations),
- preliminary draft of the environmental impacts analysis,
- the ambient modeling analyses completed to date,
- soils and vegetation analysis,
- modeling protocols

The submittal allows the Department an opportunity to offer insight on the content and quality of the proposed project and to clarify items needed to further complete the application.

PSD applications also require modeling files and results for NAAQS, increment, additional impacts and visibility, as well as, BACT analysis, and other impact analysis for energy, environmental, etc.

Submittal of Complete Application

The Department needs 4 copies of the complete application (and all subsequent submittals) for PSD projects. Three of these will be available for public review during the public comment period: one at the Department's Des Moines office, one locally, and one at EPA's Region 7 office. Additional copies will be required by the local programs if the project is in Linn or Polk Counties.

Confidentiality

Applicants may request confidentiality for certain aspects to the application. 561 IAC 2.5(7) (b) requires the facility file a second copy of the document from which has been deleted the specific information for which the facility wishes to claim confidential treatment. The second copy is the copy that will go into the file that is open to the public. Because of PSD public participation requirements, 3 public copies are required in addition to the one confidential copy.

A facility must submit a letter of substantiation, along with 2 copies of the document (one document showing all information and one document with the requested confidential material blacked out). The document showing all the information can be the same one submitted for permitting, so really the only additional information needed is the letter of substantiation and the blacked out copy. Below are the provisions and what the letter needs to contain.

561 Iowa Administrative Code Section 2.5(7) provides that all claims for confidentiality must be substantiated in writing with the following information:

1. A statement of all measures the business has taken to protect the confidentiality of the information, and a statement of intent to continue to take such measures;
2. Practices and policies of other businesses, if known, regarding confidentiality of similar information;
3. A statement that the information is not, and has not been, reasonably obtainable without the consent of the business by persons other than government bodies obtaining the material by use of legitimate means;
4. A statement demonstrating that disclosure of the information is likely to cause substantial harm to the business's competitive position; and
5. A reference to any other determinations of confidential status of the information or similar information.

A confidentiality request must be made each time confidential information is submitted. If confidentiality is not requested the subsequent submittal will be considered public. The department is not responsible for anticipating what parts of any additional submittals might be confidential. Each subsequent submittal must include the copies and documentation noted above.

For additional information, please contact the Department's legal staff.

Project Review and Issuance of Permit(s)

Once submitted, the project is assigned to a permit engineer, and reviewed for completeness. The modeling files are given to a modeler for review as well. Once the permit engineer begins the review, additional information may be requested. The reviewing engineer also may disagree with the analysis presented and may request adjustments. Often additional review is halted, or at least slowed, while the engineer is waiting for the applicants response(s). If the response is not forthcoming the application may be denied. This is without any prejudice. The applicant may resubmit new application whenever they wish. Once all questions are answered, the modeling accepted, and other requirements agreed between the company and the Department, the permit engineer will write draft permits and send to the applicant for a brief review. Once the draft permit is reasonably acceptable to both parties the public comment process is initiated.

As a part of the public participation process the Department makes available the draft permits and a Fact Sheet describing the project and details of the application review for at least 30 days at three locations. These three locations are the Department's offices in Windsor Heights, the EPA's Region 7 offices in Kansas City, and local publicly accessible site near the proposed project (commonly a library). The availability of these documents must be published to notify the public. The 30-day public comment period does not begin until that notice is published. A public hearing will also be set. Once the public comment period is ended, the Department will review all comments from EPA, the applicant, and the public and (once that review is documented) either issue the permits or revise them in response to comments. A significant rewrite of the draft permits in response to comments may require a second 30 day public comment before final issuance.

To meet the goal of 180 days for permit issuance, it is vital that applicants respond promptly to any information requests from the Department. Once the construction permit is issued, a Title V Operating Permit or application will need to be modified or submitted. For details contact the Title V section at 515-725-9580.

V. PSD APPLICATION ELEMENTS

Significant Net Emissions Elements

All calculations start with a complete and fully documented set of emission baseline actual emissions.

There are three possible net emission increase calculations that the applicant could use. Two of these can be used to determine the net emission increase from the project. These two are based on future potential to emit (PTE) or future projected actual emissions (PAE). These are then compared to baseline actual emissions (BAE) to determine whether or not the project is a major modification for PSD purposes.

As a third option, the applicant can prepare a source-wide calculation of net emission changes to “net out” of PSD review. These are progressively more complicated and more time consuming to prepare and review.

Baseline Actual Emissions

Baseline actual emissions calculations are a quantification of the typical legal emissions from those existing emission units involved in the project. The applicant can select any single 24 month interval within the past 10 years (5 years for an electric utility steam generating unit) for each pollutant. The applicant must be able to document the actual emissions during that 24-month period. If the documentation for any of the existing emission units is not adequate the applicant will need to select an interval with better documentation.

New emission units (units with less than 2 years of operation) and units which were not in operation during the 24-month interval selected all have zero baseline emissions

The baseline actual emissions shall include fugitive emissions present as well as startup, shutdown and malfunction emissions during that 24-month interval.

No credit can be given for reductions that had to be made to bring the source into compliance with any permit, rule or order. As a result emissions from the individual emission units may have to be adjusted if they were in excess of limits that existed at the time.

If you are not certain of the adequacy of your emissions estimates you need to contact the Department to arrange a discussion of the analysis.

Potential to Emit Calculations

The applicant must complete the emission calculations beyond what is needed to complete form EC, Emission calculations need to identify the emissions from each unit at maximum capacity before any emission controls. The control efficiency of the associated control equipment must be stated and resulting in the emission rate must be calculated for all the emission point(s) involved. This section helps identify the items needed by the Department to verify emissions and determine compliance with applicable

regulations. It is used in the BACT analysis as well as in determining the PSD status of the project. Remember that form EC calculations are for the maximum potential emissions from each emissions unit.

Net emissions increase for the project

This should summarize the increase in each pollutant in Tons per Year (TPY) for the project as a whole to identify whether the increase is PSD significant.

Fugitive and exempt emissions

If the stationary source is one of the 28 named sources then the calculation of emission increases must include all fugitive emissions such as from haul roads and storage piles. This must also include emission units that are normally exempt from permitting requirements under Iowa Administrative Code (IAC) 567-22.1(2).

Associated emissions increases

All emission increases that will result from the project must be included even from existing sources that will not be modified. An example is an existing unit that is running at less than its maximum capacity due to capacity constraints in the production line, but can run at a higher capacity after the project. This is called debottlenecking. Even though the debottlenecked unit was not modified, the additional emissions from that unit due to higher capacity must be counted towards total emissions increase for the project.

Documentation to support emission calculations

All emission calculations must be fully documented. This includes material to support assumptions made in the emission calculations. This could include stack test results, material safety data sheets (MSDS), manufacturer's specifications, pilot plant results, etc. If referencing EPA's AP 42 emission factors, just reference the appropriate section, do not copy the relevant AP 42 chapter.

Projected Actual Emissions

When the project involves the modification of existing emission units, the applicant can use their projection of future increases in actual emissions instead of the maximum potential emissions in calculating the total project emissions. This may be useful in determining whether or not the modification is a major modification for PSD purposes. This can be used for both modified and debottlenecked existing emission units whose emissions are increasing as a result of the project. Special care, however, must be taken to assure correct calculation of projected emissions.

Development of projected actual emissions begins with documentation of expected product production rates and the resulting uncontrolled emissions for each emission unit. Applying the expected control efficiency yields the projected actual emissions for that unit. Projects startup, shutdown and malfunction emissions must be included in this emission projection. Changes in these emissions must be justified in the application.

This calculation includes all units whose emissions will change as a result of this project including fugitive sources and sources that may be exempted from permit requirements elsewhere in the air quality regulations. Individual unit's projected actual emissions are then summed for each pollutant and

compared with the baseline actual emissions for that pollutant to determine if the project is a major modification for PSD purposes.

Note that other air quality program requirements may require the issuance of a new permit for the project and new permit conditions even if the project is determined to not be a major modification for PSD purposes.

Source-wide Net Emission Changes (Netting).

It may be possible to avoid further PSD review even if a project is a major modification based on potential to emit or projected actual emission calculations.

This may be the case if the stationary source has reduced emissions during the contemporaneous period while not relying on those reductions for some other purpose. All increases must also be counted including units.

To be contemporaneous the reductions must have occurred within the last five years and be completed before any increased emissions from the proposed changes. There is some flexibility in determining the starting emissions for existing units involving the calculation of baseline emissions for those units. This depends on the availability of adequate emissions records. Again any increases that occurred during this time interval must also be included. This includes not just new units but existing units that were previously operating but whose control equipment had deteriorated and debottlenecked units (other units that are not be installed or modified but that become able to operate at a higher production (and emissions) rate as the result of project).

To be creditable, reductions have to be real reductions, they must be contemporaneous reductions, they must be enforceable reductions and they must have a similar qualitative significance as the emissions from the project being reviewed. This also requires that the reductions well documented.

Similarly, all contemporaneous increases must be included as well as reductions.

Not surprisingly netting can get quite complicated and can involve significant effort for both the applicant as well as the review staff. It is recommended that the company meet with the Department for guidance.

BACT Analysis

As evident in the BACT definition [(567—33.3 (1))] the expectation is that the case specific BACT analysis will result in the selection of the control option which results in the “maximum degree of reduction” “achievable” for each pollutant in the project under PSD review subject to certain specific qualifiers..

A BACT analysis is required for each listed pollutant whose potential-to-emit for the project is greater than the applicable significance level. BACT analyses must be performed for each emission unit in the project emitting that pollutant and for all fugitive emission sources. A BACT analysis for opacity is required for any pollutant that could result in visible emissions.

Top-down BACT analysis

The Department uses a top-down BACT analysis for evaluating BACT options as described in EPA's 1990 Draft New Source Review Workshop Manual. This process is outlined in the following paragraphs.

The first step is to identify all potential emission reduction options. A comprehensive list of control options shall include inherently lower-emitting processes or work practices, add-on controls, or a combination of all of the above. This includes alternate processes to use the same basic raw material to produce the product (examples would be low VOC paints to reduce VOC emissions or more efficient boilers to produce steam of electricity).

The list must include technologies that have not previously been used for this particular type of unit in this particular industry but that can be adopted from other industries (Technology Transfer noted below). Although Iowa does not currently have any non-attainment areas, any available LAER technologies must be included in the analysis.

In cases where effectiveness of control technology can vary considerably with either construction or operating details, a reasonably complete variety of representative conditions must be evaluated separately (at least two). An example is a thermal oxidizer that can be constructed to operate anywhere between 90 percent efficiency to 98 percent efficiency.

The EPA's RACT/BACT/LAER Clearinghouse can provide a starting point for investigating technology options.

Technology transfer

Technology transfer applies to technologies not currently being used in a specific industry, but used in other industries with similar air stream to be treated. Technology transfer should always be included in the BACT analysis where appropriate. Any technology applicable to an emissions unit air stream similar to the unit(s) in the application must be considered. For example, SNCR is a standard control technology in boilers, but it is useful in cement kilns, which also have NO_x emissions due to high combustion temperatures. Failure to address such transferable technologies would be considered a deficiency in the application.

Technically feasible

Once the inclusive list is developed (above) then options that are not technically feasible can be eliminated. The reason that the applicant believes that particular option is not feasible must be detailed. Any control option installed and successfully operated at a similar source is considered feasible. If a control has not yet been demonstrated in operation, the applicant must determine the availability. This is based on factors including commercial availability, if it can realistically be installed and operated, and status in the licensing and commercial demonstration stage. The applicant can demonstrate that a control is not technically feasible by showing to the Department

that it is not commercially available or that unusual circumstances prohibit its successful use. If modifications are needed to make the control compatible with the emission unit, it does not mean the control technology is technically infeasible. Such costs should be considered in the economic feasibility part of the BACT analysis.

Rank remaining technologies in order of effectiveness.

All applicable technologies must be ranked in terms of most to least effective in terms of emission reductions potential. A common unit of measure shall be determined and used to rank the technologies. For instance, percent reduction or emissions per unit produced. This ranking must be quantified and that quantification must be fully described and documented for each technically feasible control option.

After listing each option in terms of most to least effective, applicants must display the expected efficiency (as percent reduction or emissions per unit), the expected emissions rate, and expected emissions reduction from baseline in tpy for each pollutant subject to a BACT analysis for each control option.

Evaluate most effective controls and document results

The expectation is that the control option which results in the “maximum degree of reduction” will be selected as BACT. There is the option, however, of selecting a less effective control option if that decision is justified based on the relative economic, energy and environmental impacts of the preferred control option compared to the more effective options. This is a case-by-case evaluation.

Economic impacts

Economic review involves evaluating the cost effectiveness compared to cost effectiveness at all types of facilities across Iowa. It does not involve evaluating a source’s ability to absorb such costs. **Generally, if a control option has been installed elsewhere it is considered economically feasible.** Before such a control option can be rejected on economic terms the applicant must adequately document that they would face extraordinary costs in implementing that technology.

If the top, or most effective, control technology option is selected by the applicant, there is no need for an economic evaluation. Economic impacts must be evaluated if the applicant wishes to utilize one of the less effective control options.

If the applicant wants to approval of a less effective control option the application must detail the costs and cost effectiveness of preferred control option and all more effective control options. The applicant does not need to do economic analyses for options that are less effective than the one preferred by the applicant.

The control cost analysis evaluates cost effectiveness of the control options being evaluated. This is to be expressed in terms of the average annual cost of that control option per ton of pollutant

removed. This combines the annualized capital cost of the controls with its annual operating expenses. This annual control cost is divided by the quantity of pollutant in tpy that the control technology will reduce to arrive at the dollars per ton value used for comparisons. It is very important the analysis for each option use the same baseline emission rate to determine the tons per year of pollutant removed. This baseline emission rate must “represent a realistic scenario of upper bound uncontrolled emissions”. Using a control option as baseline is unacceptable. The basic methodology should be similar to the OAQPS Control Cost Manual for consistency with other BACT analyses performed across the country. However, there are some significant differences that are required. **It is not acceptable to submit an economic analysis based solely on the OAQPS Control Cost Manual without the following adjustments.**

Annualized incremental costs analysis involve similar cost calculation but uses a control option as baseline (generally the next less effective option) instead of the “realistic scenario of upper bound uncontrolled emissions” used in the average cost analysis. An incremental cost analysis is only relevant if the annual average cost of the most stringent control option is extraordinary (compared to other installations) but not too extraordinary the incremental cost analysis can help distinguish the economic effectiveness of that option compared to the next less effective option. Reliance on an incremental cost analysis by itself is NOT acceptable.

The applicant must include copies of the vendor price quotes where ever applicable. The actual electronic files for any spreadsheets used to develop and cost estimates must be included in the application. The applicable commercial bond rate (Moody's seasoned AAA) at the time of the submittal is to be used for interest rates throughout the analysis unless the applicant adequately justifies an alternate cost of money specific to their company. Labor rates used in the analysis must be those commonly used within the company unless local or regional labor rates are justified as being more applicable. The work load for operation of the control equipment must be justified based on equipment vendor recommendations or some similar basis. All percent-of- cost to factors must be adjusted for the particular project under review and each percent-of-cost factor must be adequately justified. The equipment must be assumed to be in operation for 20 years unless the applicant can justify that it will be dismantled earlier or will be operated over a longer life. Control equipment costs must be apportioned over all the pollutants affected and not assigned solely to one of the controlled pollutants. Control equipment from which material is captured and used for other purposes must be included in this analysis unless the material captured is the primary reason for the operation of that emission unit.

The website for the OAQPS Control Cost Manual is:
<http://www3.epa.gov/ttnecat1/products.html#cccinfo>

Energy impacts

An energy impacts review involves the evaluation the direct energy use penalties or benefits that can result from using a control technology as compared to alternative control options. This includes quantifiable extra fuel or electricity costs required to power the control options under review. Energy impacts do not include the cost of energy. All cost components must be addressed in the economic impact analysis.

Generally, if a control option has been installed elsewhere its energy impacts are considered reasonable. Before such a control option can be rejected due to energy impacts the applicant must adequately document that they would face extraordinary and severe energy impacts in implementing that technology.

There is no need for an energy evaluation if the most effective control option is selected by the applicant. Energy impacts must be evaluated if the applicant wishes to utilize one of the less effective control options.

If the applicant wants approval of a less effective control option the application must detail the energy usage of preferred control option and all more effective control options. The applicant does not need to do energy impact analyses for options that are less effective than the one preferred by the applicant.

The applicant may consider concerns over a fuel that is scarce or not available locally at the time of the application. Projected scarcity may be considered only if that projection is a formal U.S. Department of Energy assessment. Concern by others about the possibility that currently available fuels may become scarce is not a valid basis for energy impact analysis.

Environmental impacts

Environmental impacts are those impacts beyond those associated with the pollutant being reviewed. This includes impacts from air pollutants not being reviewed under the PSD program as well as non-air quality impacts. The impact on other air pollutants that are also subject to PSD review is to be addressed in the economic impact analysis by prorating control option costs across the pollutants. Examples of non-air quality impacts are solid waste disposal of fly ash, scrubber discharges of polluted water, visibility impacts, or odor. This is different than the cost of waste disposal for example. Monetary costs are to be addressed in the economic impact analysis. All environmental impacts must be identified and quantified as applicable.

This review of environmental impacts must be performed for all control options which are more effective than the preferred option as well as the next less effective option. This review must be performed even if the most stringent option is selected as BACT as well as the next more effective option. Since many control options have very similar impacts it may be convenient to complete a full review of the preferred strategy and to merely note the differences inherent in the other strategies. The danger of this is that real differences might get overlooked. An example the identified differences between a wet scrubber and a dry scrubber might just be the difference in wastewater versus solid waste disposal concerns while the difference in the control of other air pollutants might get overlooked.

It might be possible to eliminate a control option if the PSD pollutant reductions are small compared to other adverse environmental impacts. As stated in the North County PSD Remand (<http://www.epa.gov/sites/production/files/2015-07/documents/remand.pdf>) a less efficient technology could be picked if it reduces other emissions (i.e. HAP) more effectively. . However,

applicants must show unusual site-specific characteristics why such waste disposal or pollutant emissions are unreasonable and create greater problems at the site under review than at other sites where the control is used. The review associated with the visibility analysis and the soils and vegetation analysis can provide significant input into this analysis as can local solid waste and water quality conditions.

Select BACT

The most effective option that is not ruled out through the economic, energy and environmental impacts analysis discussed above is BACT control option. The BACT limit that will be incorporated in the permit is the emission rate and averaging times that would be expected from implanting the control option and not a specified control technology.

Additional Impact Analyses

Visibility impacts

This requirement is distinct from the visibility analysis required if your project is within range of a Class I area. The suggested components of a good visibility impairment analysis are a determination of the visual quality of the area, and then an initial screening of emission sources to assess the possibility of visibility impairment. If the screening model suggests the need, a more in-depth analysis may be done.

The visibility analysis shall be conducted using the methodology described in EPA's "Workbook for Plume Visual Screening and Analysis (Revised)" October 1992 (EPA-454/R-92-023). In addition the Department maintains a "VISCREEN Tool" on the Department's web site at <http://www.iowadnr.gov/Environmental-Protection/Air-Quality/Modeling/Dispersion-Modeling> that must be used for any Level 2 visibility screening. This is further described in the "Air Dispersion Modeling Guidelines For PSD Projects" document that can be found at the same Departmental web site. All local areas of scenic importance must be evaluated. This includes airports, parks, scenic overlooks, trails and similar features. Similar regional or national importance must also be evaluated.

Iowa currently does not have a Class 1 area close enough to necessitate review for most projects, however, recent reviews have extended to ever more remote Class 1 areas.

Soils and Vegetation impacts

The Soils and Vegetation impact analysis is based on an inventory of soil and vegetation types found in the area of impact. This inventory must include all vegetation with any commercial or recreational value.

The analysis requires that sensitive crops and soils be identified for each pollutant that the project emits that could impact those crops or ecologies.

The Department uses EPA's "**A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals**" (EPA 450/2-81-078, December 1980)" with one major exception. The Department does not evaluate the crop and ecological impact of metals emissions (except for lead, (Pb) described in this publication. The applicant is encouraged to use the Department's "**Soil and Vegetation Analysis Tool**" to assure that the minimum assessment requirements are met. Both the Screening Procedure and the Analysis Tool can be found under "PSD Modeling Guidance" on the Department's AQ Modeling webpage (<http://www.iowadnr.gov/Environmental-Protection/Air-Quality/Modeling/Dispersion-Modeling>).

Since that Tool was developed the Department has produced "**The Iowa State-Wide Trace Element Soil Sampling Project: Design and Implementation**". This document summarized background level of lead (Pb) across Iowa (as well as most of the other metals identified in the "Screening Procedure". These background levels should be factored into your analysis. It is available at www.iowadnr.gov/Portals/idnr/uploads/geology/trace_element_soil.pdf .

Note that it is not sufficient to state that as the source models below the NAAQS, no impact is expected - the applicant needs to check that there are no sensitive species which could be harmed by long-term exposure to pollutant concentrations below the NAAQS as well.

Growth impacts

The application needs to include a growth projection for associated industrial, commercial or residential areas due to the proposed project, along with an estimate of air emissions from this growth. Associated growth emissions do not count towards the plant's total pollutant emissions as far as determining PSD project status, unless it is determined that an associated industrial plant qualifies as a supporting facility.

Proposed Permit Conditions

This is an optional part of the checklist. All proposed conditions may not be included by the Department in the final permit. If the applicant chooses to propose limits, averaging times, recordkeeping, or other conditions, the reasoning behind the proposed conditions must be documents especially if they are less strict than in other comparable BACT determinations. It is a good idea to propose recordkeeping language as a company generally knows what records are easily kept.

Required Application Forms

All required application forms can be downloaded from:

<http://www.iowadnr.gov/Environmental-Protection/Air-Quality/Construction-Permits/Construction-Permitting-Materials>

There are general instructions available at this site as well as specific instructions attached to each form.

These forms are periodically updated to reflect changes in regulatory requirements. It is important that you check the web site for the current forms before you complete your application. Do not rely on forms previously downloaded.

All forms, unless otherwise stated, must be included for application completeness.

Even though there are no applicable forms, the applicant must fully describe fugitive emission sources in a manner similar to form EU, CE, EP and EC and must identify to characteristics of those emission sources on form MI1 and MI2.

All forms must be filled out completely with specific details of the project. **It is NOT acceptable to leave any fields blank or to claim the information is “unknown”.** If the details have not yet settled then the application is probably premature.

Facility Information (Form FI)

The FI form is used for basic company information such as contacts, location, mailing address, etc. A responsible official could be the owner or president, a designated representative of the owner or president, or a person who works for company and prepared the application. If a consultant has prepared the application for the company then the “Permit Preparer” section must be completed. **Only one FI form is needed for each application** unless responsibilities are split such that additional forms are required.

Construction Permit Application Fee (Form AF)

The AF form is used to determine the required fee (minor sources) or obtain consent for charges accrued from review of the construction permit application being invoiced to the facility (major sources).

Application Cover Page (Form CP)

The CP form is used to provide a basic company description and other basic information, as well as a project description. The facility should also list any applicable federal standard that the facility is aware of being subject to. This form also requests a flow diagram for the application.

Emission Inventory (Form EI)

Form EI must Document all **pollutants** from **all emission units installed at the plant.** It must include all units that are exempt from permitting requirements and must state which exemption is being used and the emissions from that unit. This includes units that vent indoors. It also includes fugitive emissions. Finally the point source emissions must be summed, the fugitive source emissions must be summed, and, the total stationary source (plant) emissions must be summed.

The Department may ask for additional documentation on why units installed or modified within several years before application submittal were not considered part of the project under review.

Emission Unit Information Forms EU, EU1 through EU5

The EU forms are used to describe the new (including replacement units) or modified emission units in the project. **Every piece of equipment that produces emissions must be identified on its own EU form** (In some specific instances where a series of identical emission units are being installed the Department may accept submittal of a single EU form so long as the applicant clearly specifies which other emission units are identical)

Forms EU1 is a specialized form used for generators. EU2 is a specialized form for certain nonmetallic mineral processing plants that EU3 is a specialized form for paint booths. EU4 is a specialized form for cooling towers. EU5 is a specialized form for boilers. If you can use any of these specialized forms, you do not have to fill out a form EU **for that unit**. If an emissions unit does not fit one of the specialized forms, you must use the general EU form.

If adding a new emission unit that will exhaust through a currently permitted emission point check the “permit modification” box and give the permit number, rather than checking the “new permit” box.

The form must be filled completely out with specific information. It is not acceptable

Control Equipment (Form CE, CE1 through CE6)

The CE forms documents the control equipment (if any) for each emission unit(s) although these forms are not required for fugitive emission units. Every emission unit will be expected to have control equipment unless you have indicated on the EU form that it does not have controls.

Every piece of control equipment must be identified on its own CE form. If there are several controls in series, each must be identified on its own CE form. This must be the case even if the emissions that the control equipment captures are recycled or sold.

Form CE1 is a specialized form for Fabric Filters. Form CE2 is a specialized form for Cyclones. Form CE3 is a specialized form for Wet Scrubbers. Form CE4 is a specialized form for Thermal Oxidation. Form CE5 is a specialized form for Catalytic Oxidation. Form CE6 is a specialized form for Catalytic and Non-Catalytic Reduction. If you can use any of these specialized forms, you do not have to fill out a form CE **for that unit**.

Emission Point (Stack/Vent Information) (Form EP)

The EP form documents how emissions are released to the atmosphere. It also includes a diagram of the interrelationships between the emission unit(s) and control equipment and the particular emission point. The EU, CE and EP numbers assigned on the various forms must be included in this diagram. Please double-check to make sure the numbers line up and the relationships are correct.

Also, please check and ensure that the stack information on the Form EP is the same used in modeling.

Emission Calculations (Form EC)

Form EC is used to provide emission calculations for each new and each modified emission unit operating at its maximum potential emission rate. Please document the emission factor source. For example, if basing predicted emissions off stack test results from a similar source include the stack test report and note any differences from the units tested and permitted. Please do not use expected outlet concentrations, such as an argument that a baghouse can always meet 0.01 gr/scf.

Form MI1

Form MI1 (Modeling Information- Plot Plan) is used to provide the physical details of the surrounding plant that are needed as inputs in dispersion modeling. This needs to include a scale bar, north arrow, property boundaries, the location of each emission point, and all building heights. Include buildings that are off-site but near property boundaries.

Form MI2

Form MI2 (Modeling Information-Source Parameters) details the emission point data needed as inputs in dispersion modeling. It must include information from **all** units. Please use the potential-to-emit emission rate (based on permit allowable) rather than actual emissions. This form is not the same as Form EI. Both forms must be included.

GHG

Form GHG (Greenhouse Gas Information), at the time in which this document is being written, is required, per legislation, for each Air Construction Permit Application. The form requires an inventory showing the increases in greenhouse gases that result from the project.

VI. DISPERSION MODELING ANALYSIS

The dispersion modeling analyses and the additional impact analysis required for PSD projects are discussed in a separate document titled “Air Dispersion Modeling Guidelines for PSD Projects” which can be found here:

<http://www.iowadnr.gov/Environmental-Protection/Air-Quality/Modeling/Dispersion-Modeling>

This document includes guidance on preparing a modeling protocol, conducting the preliminary and refined (NAAQS and PSD increment) modeling analyses as well as the growth, soils and vegetation, and visibility evaluations required in the additional impact analyses.

For increment concentrations, the state of Iowa is considered to be a Class II area.

Although there are no Class I areas within 100 kilometers of Iowa’s borders, the possible Class I area impact analysis requirement are also discussed in this document.

VII. VI. ADDITIONAL RESOURCES

This document uses a number of terms that have specific (legal) meanings within the PSD program. When you begin developing your application you should rely on the rule definitions. The specific legally binding definitions can be found in Section 33.3(1) of Departmental rules [567-33.3(1)] at <https://www.legis.iowa.gov/law/administrativeRules/rules?agency=567&chapter=33>

A limited number of terms come from EPA guidance documents. These documents are identified in the discussion using that term. Additional information may be available from the following sources.

Department BACT FAQ

http://www.iowadnr.gov/portals/idnr/uploads/air/insidednr/conpermit/bact_faq.pdf

Department Air Construction Permit contact page

<http://www.iowadnr.gov/About-DNR/DNR-Staff-Offices/Air-Quality-Staff>

Department information on endangered/sensitive species

<http://www.iowadnr.gov/Conservation/Threatened-Endangered>

IDALs information on endangered plants

(http://www.iowaagriculture.gov/Pesticide/endangered_species.asp).

Department regulations (IAC 567)

<https://www.legis.iowa.gov/docs/iac/rule/03-18-2015.567.33.3.pdf>

Draft EPA 1990 New Source Review Workshop Manual

<http://www.epa.gov/nsr/nsr-workshop-manual-draft-october-1990>

EPA AP-42 emission factors

<http://www.epa.gov/ttn/chief/ap42/index.html>

EPA Headquarters NSR Website

<http://www.epa.gov/nsr/>

EPA Region VII NSR Website

<http://www.epa.gov/caa-permitting/caa-permitting-epa-region-7-midwest>

EPA requirements for monitoring quality assurance documentation (QAPP, QMP, and SOPs):

<http://www.epa.gov/quality/qatools.html>

<http://www.epa.gov/ttnamti1/files/ambient/pm25/qa/QA-Handbook-Vol-II.pdf>

OAQPS Cost Manuals

<http://www3.epa.gov/ttnecat1/products.html#cccinfo>

PSD Monitoring Guideline “Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD) (EPA-450/4-80-012, Nov. 1980, revised Feb. 1981)”.

<http://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=2000MXM2.PDF>

RBLC Clearinghouse

<http://cfpub.epa.gov/RBLC/>