

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
BUREAU OF AIR

December 2002

Responsiveness Summary
for Public Questions and Comments on the
Construction Permit Application from
Corn Belt Energy Corporation

Site Identification No.: 107806AAC
Application No.: 01070028

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INTRODUCTION

Corn Belt Energy Corporation (Corn Belt) submitted an application for an air pollution control construction permit for an electric power generation facility near Elkhart. The proposed facility would be a coal-fired power plant at a site located on Elkhart Mine Road. The proposed project is considered a major source of air emissions and is subject to the federal rules for Prevention of Significant Deterioration of Air Quality, 40 CFR 52.21.

Upon review of comments received during the public comment period and final review of the application, the Illinois EPA has determined that the application meets the standards for issuance of a construction permit. Accordingly, on December 17, 2002, the Illinois Environmental Protection Agency (Illinois EPA) issued a permit to construct the proposed facility to Corn Belt. The facility must be constructed and operated in accordance with applicable regulations and the conditions of the permit.

DESCRIPTION OF PROPOSED PROJECT

The proposed power plant would have a single U-fired boiler. This is an advanced boiler design with downward-fired combustion, which provides high residence time and temperature in the combustion chamber and allows much of the coal ash to form liquid slag that is recovered at the bottom of the boiler. The boiler would be equipped with low NO_x burners, staged combustion air, a selective catalytic reduction (SCR) system, an electrostatic precipitator, and a flue gas desulfurization scrubber to reduce and control its emissions. Even though the boiler would be coal-fired, natural gas would be used for startups of the boiler. The plant would also include handling and storage facilities for coal, limestone and ash, cooling towers, and other ancillary operations.

The plant would have a nominal electrical output of 91 megawatt (gross). This is relatively small for a new coal-fired power plant. However, the size is consistent with Corn Belt's role as the local rural electric cooperative serving residents of central Illinois.

The plant would be a mine mouth plant, located adjacent to the existing Turriss mine east of Elkhart. Development of the plant at a mine site eliminates energy consumption and cost for shipping coal.

The project would be partially funded by grants from the United States Department of Energy (USDOE) Clean Coal Program and the Illinois Department of Commerce and Community Affairs (DCCA). The general objective of the USDOE for this project is to develop technology for cleaner and more efficient coal-fired boilers that can be applied to commercial projects in the near-term. One component activity planned for the USDOE demonstration project is temporary use of coal reburning on the boiler to evaluate the feasibility and effectiveness of this technique in controlling NO_x emissions.

COMMENT PERIOD AND PUBLIC HEARING

The Illinois EPA Bureau of Air evaluates applications and issues permits for sources of emissions to the atmosphere. An air permit application must appropriately address compliance with applicable air

pollution control laws and regulations before a permit can be issued. Following its initial technical review of Corn Belt's application, the Bureau of Air made a preliminary determination that the application met the standards for issuance of a construction permit and prepared a draft permit for public review and comment.

The public comment period began on June 17, 2002, with the publication of a notice in the Springfield State Journal-Register. Notices were also published in this paper on June 24 and July 1, 2002. A public hearing was held on August 1, 2002 at the Elkhart Elementary School in Elkhart to receive oral comments and answer questions regarding the application and draft air permit. The comment period remained open until August 31, 2002 to receive written comments.

AVAILABILITY OF DOCUMENTS

The permit issued to Corn Belt and this responsiveness summary are available on the Illinois Permit Database at www.epa.gov/region5/air/permits/ilonline.htm (please look for the documents under All Permit Records, PSD, New). Copies of these documents may also be obtained by contacting the Agency at the numbers listed at the end of this document.

APPEAL PROVISIONS

The permit being issued for the proposed facility provides approval to construct pursuant to the federal rules for Prevention of Significant Deterioration of Air Quality (PSD), 40 CFR 52.21. Accordingly, individuals who filed comments on the draft permit or participated in the public hearing, may petition USEPA to review the PSD provisions of the issued permit. In addition, as comments were submitted on the draft permit for the proposed facility that requested a change in the draft permit, the issued permit does not become effective until after the period for filing of an appeal has passed. The procedures governing appeals are contained in the Code of Federal Regulations, "Appeal of RCRA, UIC and PSD permits," (40 CFR 124.19). If an appeal request will be submitted to USEPA by a means other than regular mail, refer to the Appeals Board website at www.epa.gov/eab/eabfaq.htm#3 for instructions. If an appeal request will be filed by regular mail, it should be sent on a timely basis to the following address.

US Environmental Protection Agency
Clerk of the Environmental Appeals Board
MC 11038
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460-0001
Telephone: 202/501-7060

CHANGES BETWEEN THE DRAFT AND FINAL PERMITS

- Finding 1(b): The general description of the proposed boiler now addresses the boiler's rated heat input.
- Condition 2(b): The BACT provisions for the boiler were revised to clarify that the limit for particulate matter (PM) applies to particulate matter as measured by USEPA Method 5 or Methods 201 or 201A. Changes were also generally made to clarify the form of other BACT limits for the boiler.
- Condition 2(b)(iii): The BACT limit for nitrogen oxides (NO_x) for the boiler following the demonstration period was lowered to 0.10 lb/million Btu, with provision for a lower limit to be set based on an evaluation of actual NO_x emissions of the boiler, as originally included in the draft permit.
- Conditions 2(b)(v): The BACT limit for volatile organic material (VOM) emissions from the boiler was removed, as VOM emissions from the project are not significant, as stated in Finding 3.
- Condition 3(c): Condition added to address BACT for the cooling tower, setting the drift rate specification for the drift eliminators as a BACT requirement.
- Conditions 7(a): The emission limits for volatile organic material (VOM) emissions from the boiler were raised to reflect new data from Corn Belt.
- Condition 10(a)(A): Testing provisions were revised to clarify the obligation of the source to perform emission testing upon request by the Illinois EPA for emission units other than the boiler.
- Condition 10(a)(i)(B) and (b)(ii): Testing provisions for the boiler were revised to address testing of dioxin/furan emissions.
- Condition 10(b)(ii): Testing provisions for condensable particulate emissions from the boiler, were revised to specify USEPA Method 202, rather than an alternate measurement with USEPA Method 5.
- Condition 12: Provisions for continuous emission monitoring were revised to make clear that required monitors must be certified and comply with other applicable requirements for quality assurance.
- Other: Various editorial changes made to correct typographical errors and improve clarity.

QUESTIONS AND COMMENTS

Background Questions

- 1. Given the design heat input of the boiler, i.e., 900 million Btu/hour, what would its nominal exhaust rate be in dry standard cubic feet (dscf)?**

The maximum exhaust rate of the proposed boiler would be about 9,000,000 dscf per hour. This rate was calculated by multiplying the design heat input of the boiler by the standard exhaust factor in USEPA Reference Method 19 for combustion of bituminous coal.

- 2. What is the as-designed expected sulfur content of the coal supply for the proposed boiler, in lb/million Btu, as fired?**

The expected sulfur content of the coal is 3.1 lb/million Btu heat input. This is based on the composition of the coal currently mined at Elkhart, which contains about 3.25 percent sulfur by weight and has a heating value of about 10,450 Btu/lb. Assuming all sulfur in the coal is emitted as SO₂, the equivalent uncontrolled SO₂ emission rate would be 6.2 lb SO₂/million Btu.

- 3. What are the as-designed and expected levels of nitrogen oxides (NO_x) achieved by the combustion controls on the proposed boiler, as would be measured at the inlet of the selective catalytic reduction (SCR) control system?**

Corn Belt has stated that the inlet NO_x loading to the SCR is expected to be in a range between 0.2 and 0.6 lb/million Btu, with a predicted emission rate of 0.34 lb/million based on scale-up of the results from the pilot unit. The exact rate of emissions will depend upon how effective the combustion techniques, i.e., low-NO_x burners and staged combustion air, are in preventing formation of NO_x.

- 4. What is the expected annual throughput of ammonia?**

Depending on the level of operation of the boiler and the amount of NO_x that must be controlled by the SCR, the usage of ammonia would likely be in the range of 300 to 1300 tons/year. This is based on a nominal factor for ammonia usage by an SCR, i.e., 0.75 pound per pound of NO_x emissions controlled by the SCR.

- 5. Since ammonia is an extremely hazardous substance, what is the maximum possible accidental release of ammonia?**

An extremely hazardous release of ammonia is not expected to be possible at the proposed plant. While USEPA has classified concentrated ammonia as an extremely hazardous substance, Corn Belt has stated that it does not plan to use concentrated ammonia. A dilute form of ammonia would be used, such as a

water solution of ammonia containing only 19 percent ammonia, greatly reducing the risks from handling ammonia. In addition, if the facility did use concentrated ammonia, the handling of ammonia would be subject to federal rules under Section 112(r) of the Clean Air Act. These rules require sources to develop and maintain plans to prevent accidental releases of extremely hazardous substances and to minimize the consequences of any such release that does occur. These plans are to be developed working with local emergency response personnel in a process that is separate from the permitting of a proposed plant.

Best Available Control Technology

6. **The determination of Best Available Control Technology (BACT) for particulate matter (PM) for the proposed boiler is deficient. The Illinois EPA has not provided adequate support for its BACT determination for PM. The boiler should be required to use a baghouse to control PM. Baghouses have superior removal capabilities than electrostatic precipitators. For example in acting on the East Kentucky Cooperative Spurlock facility, the Kentucky Division of Air Quality determined that baghouses have the highest control efficiency of any particulate control option. The BACT limit for the baghouse should be set at a rate of 115 lbs PM/billion dscf. (Baghouses have achieved measured control rates of 42 lb PM/billion dscf.) BACT should also be set at 0.0095 lb/million Btu, since the North Hampton Generating Station in Pennsylvania has achieved an emission rate of 0.01 lb/million Btu.**

The comment does not show that the BACT determination for PM for the proposed boiler is deficient. The proposed boiler is a pulverized coal boiler designed to burn high-sulfur coal and would be equipped with an ESP followed by a scrubber for flue gas desulfurization (FGD). Both the Spurlock and Northhampton projects are circulating fluidized bed (CFB) boilers, which are a fundamentally different type of boiler, and neither is equipped with an FGD scrubber.

A baghouse may be considered the top ranked particulate control for a CFB boiler for several reasons but for projects like the proposed boiler, an ESP is an appropriate control technology. For a CFB boiler, the loading of dust in the flue gas is much higher due to the presence of limestone and lime. The presence of this material, as well as the fact that significant SO₂ is removed during combustion before the particulate control device, produces a large amount of particulate with high resistivity. Particulate with high resistivity is difficult to charge electrically and is difficult to remove from the plates of an ESP once collected, as needed for effective operation of an ESP. Similar factors are also present for boilers that control SO₂ emissions with dry scrubbing or an absorber system in the ductwork before the particulate matter control device. These factors are not present with the proposed boiler given its design. In addition, the location of the SO₂ removal device at the back end of the control train for the proposed boiler means that the particulate control device will be exposed to relatively high concentrations of SO₂. Localized cooling of the exhaust gas in the baghouse can lead to corrosion problems and bag failures that make baghouses less reliable on a day-to-day basis. In contrast, the design of an ESP is simpler and more robust. Thus, when one reviews boiler projects like the proposed facility, such as the Orlando Utilities Commission and Santee Cooper coal-fired power plants, which are equipped with wet FGD scrubbers for SO₂ control, one finds that ESPs are used for particulate matter.

The emission limit set for PM for the “ESP” is also appropriate. In this regard, the emission limit is a reflection of both the ESP, the primary particulate control device, and the FGD scrubber. Any scrubber must be designed and operated so as not to lose excessive amounts of solids laden scrubbant back into the atmosphere. The emission limit set for the proposed boiler is consistent with the emission limit for new boilers equipped with FGD scrubbers.

7. **The determination of BACT for the proposed boiler for particulate matter (PM) is deficient because it failed to consider condensable particulate matter (CPM). USEPA has determined that when addressing PM, PSD permitting must address CPM, if present. USEPA has repeatedly required PSD permits to include limits and testing provisions for CPM. CPM must also be considered in the BACT determination. The permit for the proposed boiler should include a BACT limit for emissions of CPM, with testing performed by USEPA Method 202.**

The Illinois EPA did consider CPM in the permitting of the proposed boiler. Corn Belt provided information with respect to add-on control for CPM from the proposed boiler. This information shows that CPM will be effectively controlled by the scrubber used for control of SO₂ emissions, which will reduce the temperature of the exhaust gas to less than 200 °F. While PM₁₀ includes both filterable and condensable fractions, there is limited information available upon which to base a numerical BACT limit for the condensable fraction. Thus the BACT limit for PM only addresses the filterable fraction of PM.

With respect to the air quality analysis, the results of the analysis submitted by Corn Belt for filterable PM were doubled to account for condensable PM. The maximum PM air quality impacts of the proposed project are still de minimis, i.e., below the significant air quality impact levels established by USEPA.

Measurements for both filterable and condensable particulate must be performed as part of the testing of the proposed boiler (refer to Condition 10(b)(i)). The issued permit requires the testing for condensable particulate to be performed with Method 202. This testing provision and other conditions in the issued permit dealing with PM emissions were revised to make clear whether the provisions apply to both filterable and condensable PM or only filterable PM.

8. **The determination of BACT for the proposed boiler for nitrogen oxides (NO_x) is deficient because the emission limit is not stringent enough. The determination relies upon use of SCR, without consideration of SCONOX technology, which is equal or more effective in controlling emissions. It also only relies on achievement of 80 percent removal of NO_x by the SCR, when SCR has demonstrated the ability to achieve well above 90 percent control. When applied to gas-fired facilities, SCR can achieve a NO_x emission rate of 0.008 lb/million Btu. The performance of the SCR for the proposed boiler can be enhanced by its design, e.g., greater catalyst area, a more active catalyst, increased residence time, and better temperature control. Considering cost and equipment degradation over time, the**

BACT limit for NO_x for the proposed boiler should be set at 0.024 lb/million Btu, rather than 0.12 lb/million Btu.

The NO_x limits set for the proposed boilers are consistent with NO_x limits set for other new coal-fired boilers, with appropriate timing to address the special demands posed by a demonstration project. The NO_x emission rates required of and achieved by boilers fired with natural gas are not a reasonable basis to set a NO_x limit for the proposed boiler, which would fire coal. This is because there are fundamental differences in the combustion process and the composition of the flue gas for natural gas and coal that affect the level of NO_x emissions and control of those emissions.

The requirement to use SCR as an add-on control technique for NO_x is also appropriate. SCR has been and is being installed on many coal-fired utility boilers. SCONOX has not yet been demonstrated to be technically feasible on coal-fired boilers, a prerequisite for establishment as BACT. Notably, unlike SCR, SCONOX uses a catalyst that must be continually regenerated while the emission unit is in operation. This is accomplished by installing the catalyst in a number of compartments that are isolated in turn from the hot boiler exhaust with louvers so that steam can be introduced to regenerate the catalyst. Given the greater volumes of flue gas in a coal-fired boiler, the presence of significant loading of PM and SO₂ in the flue gas, and the changes in the temperature profile that occur in the ductwork during operation of a utility boiler, effective isolation of a SCONOX catalyst for regeneration is far more difficult for a coal boiler than for the units firing natural gas where SCONOX has been applied

The permit also appropriately relies on the capabilities of SCR to control NO_x. As a general matter, the preferred approach to “control” of NO_x emissions is to use combustion technology that minimizes the formation of NO_x, rather than add-on control devices to collect and “neutralize” NO_x. The permit achieves an appropriate balance between the preventative approach and the remedial approach. This is done by setting the NO_x limits for the proposed boiler at a level consistent with or slightly better than that required of other new coal-fired boilers (0.07 to 0.10 lb/million Btu). If the permit were to simply require 90 percent removal by the SCR, a level of control nominally achievable with SCR, irrespective of the level of “uncontrolled” NO_x, as suggested by this comment, it would reduce the incentive for the source to prevent formation of NO_x. It would also significantly increase both the costs and environmental impacts associated with operation of an SCR system, as it takes more effort to maintain the efficiency of a control device as the concentration of the pollutant entering the device goes down.

- 9. The determination of BACT for NO_x should require immediate compliance with the selected emission limit, i.e., 0.070 lb/million Btu, and not allow three years of initial operation at which time a lower limit may be established. Indeed, as already stated, the NO_x limit should be 0.024 lb/million Btu, effective not later than 180 days from the date electricity is first generated.**

This comment is not accompanied by any support for the position that immediate compliance should be required with a “final” NO_x limit. This is critical given that the proposed project is also a USDOE technology demonstration project. One element in this demonstration is installation of a coal reburn system on the boiler to evaluate the feasibility and effectiveness of using this technology in reducing NO_x emissions. In this regard, one of the potential advantages of the U-fired boiler design is sufficient

residence time for reburn with coal, rather than with natural gas, as with current reburn technology. In addition, the boiler will be equipped with low-NOx burners, staging air, and SCR. This has the potential to reduce NOx emissions from the boiler to levels below those achieved by other new coal fired boilers. However, time is needed to conduct the evaluations for USDOE, balance the different NOx control measures for both efficient and effective NOx control, and confirm the reliability of NOx control.

The phased approach in the draft permit for NOx limits reasonably addressed the special circumstances presented by this project. An initial NOx limit is set at 0.12 lb/million Btu, which is generally an appropriate limit for BACT. If the Illinois EPA finds that the boiler can consistently comply with a more stringent NOx limit based on an evaluation of NOx emissions during the initial years of operation, a lower limit (as low as 0.07 lb/million Btu) may be set. This evaluation of NOx emissions is to be completed within two years of initial startup of the boiler, with provision for an additional year if more time is needed to effectively evaluate NOx controls and propose a final NOx limit. Moreover, if Corn Belt does not complete this evaluation in a timely manner, the NOx limit automatically drops to 0.070 lb/million Btu.

Upon further consideration in response to this comment, the Illinois EPA has further refined the approach in the issued permit, to provide more certainty as to the NOx limit that is to be applicable. The NOx limit for the demonstration period is still 0.12 lb/million Btu. However, following this period, the NOx limit automatically drops to 0.10 lb/million Btu, with provision to set a limit as low as 0.07 lb/million Btu based on evaluation of actual performance. This refinement reflects the Illinois EPA's expectation that the boiler's actual performance should certainly show that it can consistently comply with a NOx limit of 0.10 lb/million Btu.

- 10. The determination of BACT for the proposed boiler for emissions of NOx is deficient because it does not clearly require operation of the selective catalytic reduction (SCR) system whenever it would be effective in controlling NOx emissions. In particular, the permit should require injection of ammonia reagent whenever the temperature and level of NOx present at the SCR system are in the range for the SCR to be effective in controlling NOx emissions.**

Operation of the SCR system, as requested by this comment, will be appropriately achieved with the NOx emission limit established for the boiler by the permit. The continuous emission monitoring system required for NOx will measure not only compliance with the NOx limit but also to provide the necessary information to allow Corn Belt to effectively operate the SCR to control NOx emissions.

Moreover, this comment does not suggest a particular approach to the degree to which the SCR system should be operated, separate from and beyond compliance with the applicable emission limit set for NOx. This is important because, as noted by another comment, the use of ammonia in the SCR may be accompanied by ammonia slip, which contributes to the formation of PM in the atmosphere. Arguably, to minimize this impact, the SCR system should be used to the least extent practical, that is, only as needed to reasonably assure compliance with the NOx limit.

- 11. The determination of BACT for the proposed boiler for sulfur dioxide (SO₂) is deficient. Crushed limestone should be required to be added to the boiler as a combustion reagent to assist in control of SO₂ emissions. The SO₂ emission limit also is not stringent enough. Old Dominion and SEI Birchwood operate with SO₂ emissions that are less than 0.1 lb/million Btu. The BACT limit for SO₂ should be set at 0.095 lb/million Btu.**

Addition of limestone to the combustion zone of the boiler, as suggested by this comment, would be inconsistent with the design of the proposed boiler. It would also interfere with the environmental objectives for the proposed boiler. In particular, the slagging design of the boiler is intended to recover the majority of the ash contained in the coal fuel as bottom ash, in the form of a glass-like slag that can be beneficially used. Introduction of limestone as suggested would alter the character of the bottom ash and greatly increase the volume of fly ash. It would also not be a particularly effective means to control SO₂ emissions, given the conditions present in the combustion zone of the boiler. Use of lime (calcined limestone) in a scrubber specifically designed to control SO₂ emissions consumes less reagent material while providing greater removal of SO₂. In this regard, the SO₂ limit for the proposed boiler, 0.15 lb/million Btu, requires scrubbing to achieve over 97.5 percent removal from the uncontrolled SO₂ with the design coal supply, a very effective control of SO₂ by a scrubber. The scrubber also yields a gypsum-rich material that has the potential to be beneficially used.

The Old Dominion and SEI Birchwood plants certainly do not constitute an adequate basis to set a more stringent SO₂ limit for the proposed boiler. They are significantly different from the proposed boiler as they are designed to fire low sulfur coal, i.e., coal containing less than half the sulfur of coal being mined at Elkhart.

- 12. The determination of BACT for the proposed boiler is deficient because the emission limit for carbon monoxide (CO) is not stringent enough. An unfavorable trade-off has been made to allow operation of the boiler at a low temperature and with little excess air to reduce the cost of NO_x emission control, with CO emissions that are too high in the absence of an oxidation catalyst system. Recent emission measurements for gas-fired facilities indicate that a CO emission rate of 0.015 lb/million Btu is achievable. The BACT limit for CO should be set at 0.04 lb/million Btu.**

The CO emission rates required of and achieved by boilers fired with natural gas do not provide a reasonable basis to set a CO limit for the proposed coal-fired boiler. As with NO_x, there are fundamental differences in the combustion process for gaseous and solid fuels that affect the levels of CO emissions. In addition, the CO emission limit for the proposed boiler has not been set to allow low temperature operation of the boiler as suggested by this comment. Given the slagging design of the boiler, its combustion temperature would inherently be high, i.e., the temperature must be high enough to melt the ash and form liquid slag. Moreover, the SCR system on the boiler allows for control of NO_x without the need to skimp on excess air, which could also affect the thermal efficiency of the boiler.

For coal-fired boilers, control of CO emissions is achieved with good combustion practices to prevent formation of CO, not with add-on control devices that provide post combustion cleanup of CO emissions. Accordingly, when setting a CO limit for a coal-fired boiler, consideration must be given to

the specific design and other circumstances of the unit. For the proposed boiler, the CO limit has been set an appropriate level to address both the variability in CO emissions during the demonstration phase and the uncertainty in the ultimate performance of the boiler for CO, given the innovative nature of the boiler, and to allow optimization of the combustion process to reasonably minimize formation of NO_x.

13. The determination of BACT for the proposed boiler is deficient because it failed to address emissions of beryllium.

Beryllium is not subject to a BACT determination pursuant to the PSD rules. This is because emissions of hazardous air pollutants, such as beryllium, are generally regulated under Section 112 of the Clean Air Act and not under the PSD rules. (Refer to Section 112(c) of the Clean Air Act.)

The control technology determination for the boiler does address beryllium and other heavy metals present in coal by the requirements established for control of PM. In this regard, there are a number of trace heavy metals present in coal, including beryllium. At this time, emissions of these heavy metals, which unlike mercury are emitted as PM, are controlled by effective control of PM and further specific devices and measures are not appropriate for these metals.

14. The determination of BACT for the proposed boiler is deficient because it did not consider emissions of ammonia in the BACT determination for particulate matter (PM). In this regard, the PSD rules implicitly command consideration of ammonia, which is a precursor compound for formation of PM₁₀ in the atmosphere. The permit should require that the source take measures to minimize use of ammonia. The emissions of ammonia from the proposed boiler should be limited to 3 ppm with compliance determined by continuous emissions monitoring.

Ammonia, itself, is not a regulated air pollutant. Accordingly, there is not a direct regulatory basis to set a limit for ammonia or to require continuous emissions monitoring for ammonia slip from the proposed boiler. The comment argues that ammonia may be “indirectly” regulated, as it is a precursor to formation of PM₁₀ in the atmosphere. However, the comment did not discuss the further issues related to this comment, that is, whether ammonia can and should be regulated.

The Illinois EPA’s conclusion is that a limit should not be set for ammonia emissions from the proposed boiler. Concerns exist about whether ammonia can be effectively regulated as requested, as there is not a USEPA Reference Method for measurement of ammonia, much less accurately measure ammonia at 3 ppm. Continuous emission monitoring for ammonia is also problematic, in part because there is not a method against which to confirm accuracy of monitoring in this range. Thus it may only be feasible to set a limit at 5 or 10 ppm. More importantly, the Illinois EPA did not find that the ammonia from the proposed boiler should be regulated. In particular, the amount of ammonia slip would be small and would not pose a direct threat to air quality. The ammonia is being used as a reagent solely to control emissions of NO_x, which is a pollutant, a precursor to ozone, and a precursor to PM₁₀. It is in the self-interest of the source to minimize its use of ammonia, using only as much as needed to reasonably comply with the applicable limit set for NO_x, thereby minimizing ammonia slip. Finally, if a limit were

set for ammonia, the limit could directly interfere with and hamstring the source's ability to comply with requirements for NOx, with the nature of such impacts dependent on the limit that is selected.

- 15. The determination of BACT for the proposed boiler is deficient because it does not adequately address periods of startup, shutdown and malfunction. Periods of startup, shutdown and malfunction have been excluded from the numerical limits set as BACT. The permit also does not provide details on the number and nature of startups on the startup, shutdown and malfunction. The permit should include numerical BACT limits for startup and shutdown.**

The determination of BACT for the boiler adequately addresses periods of startup, shutdown and malfunction. The permit builds upon information in the application that generally describes the number and nature of startups of the proposed boiler. The Permit requires that the source follow good air pollution control practice to minimize emissions during these periods. In particular, reasonable practices must be used to minimize emissions during startup and shutdown of a boiler. Among other items, these practices must include use of natural gas during startup to heat the boiler prior to initiating firing of solid fuel, operation of the boiler and associated air pollution control equipment in accordance with written operating procedures that include startup, shutdown and malfunction plan(s); and inspection, maintenance and repair of the boiler and associated air pollution control equipment in accordance with written maintenance procedures.

The comment does not justify why a different approach, such as alternative emission limits, should be set to address periods of startup, shutdown and malfunction. This is important as such an approach would have to address the possible range of operation and emissions present during these periods. It is particularly important as applied to the proposed project, as it would be a USDOE demonstration project, with additional variation needed in boiler operation during the demonstration period. It is also important as the approach to these periods taken by the proposed permit allows refinement to the required practices based on actual experience with the boiler over time. As such, the Illinois EPA would argue that this approach would more effectively control emissions than an alternative approach involving fixed limits set at this time based only on the information available at the time of application.

- 16. The determination of BACT for PM emissions from minor emission units at the proposed facility is deficient. Other than a limit on annual emissions, the draft permit does not include specific provisions for the cooling tower, which should be limited to a drift rate (loss of water droplets) of no more than 0.0005 percent. For material handling operations controlled by fabric filters, PM emissions should be limited to no more than 0.0008 grain/dscf of exhaust (equivalent to 115 lb/billion dscf), since fabric filters have achieved measured emission rates of 0.0003 grain/dscf. These limits should be accompanied by appropriate compliance procedures, including annual performance tests, opacity monitoring, and monitoring of pressure differential and fan motor power.**

For the cooling tower, BACT was determined to be operation as proposed by the application. This entails using drift eliminators (which serve to control the loss of water droplets from a cooling tower)

designed to achieve a drift rate of no more than 0.001 percent. The limit for drift rate recommended by this comment, which was not accompanied by any supporting information, is an unrealistic emission limit for this unit. In this regard, a drift rate of 0.001 percent is consistent with the BACT requirements set for the proposed Thoroughbred Generating Station and Kentucky Mountain Power coal-fired power plants. The recommended compliance procedures, which were also unsupported, are uncalled-for for a cooling tower of this size and circumstances. In particular, there is not an established air pollution control method to routinely measure the drift loss from a cooling tower. Routine records on water throughput and solids content are not appropriate for this cooling tower, given the small amount of emissions and the use of a local water supply. However, in response to this comment, a condition is included in the issued permit specifying the drift rate specification for the cooling tower drift eliminators.

For material handling systems controlled with fabric filters or baghouses, BACT was determined to be control devices designed and operated to comply with an emission limit of 0.01 grain/dscf (refer to Condition 3(a)(i) and (ii)). This is an appropriate limit for baghouses in this type of service. Compliance should be able to be readily determined by direct observation of stacks for the presence of visible emissions, review of operating and maintenance records for the units, and emission tests upon specific request by the Illinois EPA. This general approach can be supplemented in the CAAPP Permit for the facility, if needed, based on actual operating experience with these units. The compliance procedures recommended by this comment, which were not accompanied by detailed supporting information, are uncalled-for with these types of units. The recommended emission limit is also an unrealistic emission limit for these units. In this regard, emission limits for baghouses are set at levels that reflect acceptable operation and maintenance of the units and that can be reliably achieved on a continuing basis. Compliance testing of baghouses routinely shows emissions that are significantly below the applicable emission limit, often by an order of magnitude.

17. The determination of BACT for the proposed facility is deficient as it does not adequately demonstrate that so-called “fugitive” emission units excluded from the BACT determination in fact qualify as fugitive emissions, as defined by 40 CFR 52.21(b)(20).

Contrary to what this comment claims, fugitive emissions have been included in and are subject to a determination of BACT. In particular, the permit requires Corn Belt to follow good air pollution control practices to minimize nuisance fugitive dust from plant roads, parking areas, storage piles and other open areas of the plant. These practices must include pavement on all regularly traveled roads and treatment (flushing, vacuuming, dust suppressant application, etc.) of paved and unpaved roads and areas that are routinely subject to vehicle traffic for very effective and effective control of dust, respectively. Emissions from storage piles must be controlled by material quality and enclosure as practicable.

These sources of fugitive particulate matter emissions are not excluded from the BACT determination. This is because the proposed project is a major project subject to PSD based on its “non-fugitive” emissions. Once a project becomes a major project under the PSD rules, all of the project’s emissions, both fugitive and non-fugitive, become subject to the BACT requirement of the PSD rules.

Permit Provisions

- 18. The maximum design heat input of the proposed boiler should be mentioned in the permit. This is because all the emission limitations in the permit for the boiler are based on its heat input.**

The maximum heat input for the boiler indicated in the permit application is about 900 million Btu per hour. This fact has been added to the description of the boiler in the issued permit.

- 19. The permit should limit the annual heat input to the proposed boiler. This is necessary to bound the annual emissions of the boiler in a manner that is federally enforceable, because all the proposed limits are based on heat input. In particular, based on a BACT limit of 0.15 lb SO₂/mmBtu and an annual SO₂ emission limit of 584 tons/year, the heat input to the boiler should be limited to 7,787,000 million Btu/year. This limitation should be accompanied by quarterly reporting for actual boiler heat input.**

As explained above, even though the design heat input of the boiler was used to calculate short-term emission rates, the resulting short-term emission limits are enforceable independent of the heat input to the boiler. These short-term emission limits are directly enforceable through testing, monitoring and recordkeeping required by the permit. The annual emission limits on the boiler reflect continuous operation at these short-term limits. They do not reflect any adjustment for less than full continuous operation. Thus, there is no need to place operating limitations on the annual operation of the boiler as might be needed if the permit relied upon a significant restriction on the annual operation of the boiler.

- 20. The VOM emissions limits for the proposed boiler need to be higher. Upon further review of the design data for the boiler, it was realized that there is not sufficient data to conclude that the proposed boiler would meet the limits in the draft permit with the degree of confidence and certainty needed for enforceable emission limits. (Comment from Corn Belt.)**

The VOM emission limits for the boiler have been raised, as requested, with the limits set at 6.0 lb/hour and 26.3 tons/year. In addition, the Illinois EPA did not include a BACT limit for VOM in the issued permit since the permitted VOM emissions from the project are less than 40 tons/year and not significant under the PSD rules. As related to emissions of organic hazardous air pollutants from the boiler, a VOM BACT limit is not needed because carbon monoxide (CO) emissions are limited as a means to assure good combustion practices, with continuous monitoring required for CO.

Compliance Procedures

- 21. The permit should contain explicit requirements addressing certification of continuous emissions monitors. In particular, it is inappropriate for the draft permit to use the term “evaluate” in conjunction with emission monitors required by the permit.**

The continuous emissions monitors required by the permit are subject to provisions of the federal New Source Performance Standards (40 CFR Part 60) and the federal Acid Rain Program (40 CFR Part 75). These provisions include detailed requirements for initial certification and ongoing quality assurance for emission monitors. These requirements apply to the emissions monitors required by the permit, as generally recommended by this comment.

In addition, to minimize misunderstandings with respect to requirements for continuous emission monitors, in the issued permit, the term “certify” has been substituted for the term “evaluate.”

- 22. The permit should require testing of the proposed boiler for emissions of dioxin as part of the initial compliance testing for the boiler and annually thereafter.**

A provision for testing of dioxin emission has been added to the permit. However, periodic testing for dioxin emissions, as broadly requested by this comment, is not justified. This is because coal-fired utility boilers have not been identified as sources that generally warrant testing of dioxin emissions. This is a consequence of the combustion characteristics of coal, the good combustion conditions found in utility boilers, and the air pollution control equipment installed on utility boilers. However, because the proposed boiler would use new boiler technology, a dioxin emission test is required during the boiler’s initial years of operation.

- 23. The permit should require continuous monitoring for mercury emissions from the proposed boiler when such systems have been approved by USEPA.**

The control requirements for mercury have been crafted to use compliance procedures that are currently available, i.e., periodic emission testing, fuel sampling, and operational monitoring. They do not rely on a continuous emission monitoring system that has yet to be developed. Accordingly, there is no need to require such a system when it is developed. Moreover, it would be inappropriate for the permit to impose requirements that rely on some future monitoring system, whose capabilities and limitations cannot be assessed at this time.

Administrative Procedures

- 24. The public notice on the draft permit appears deficient because it did not recite the potential emissions of the proposed source, for either criteria pollutants or hazardous air pollutants. To address this deficiency, the Illinois EPA should republish a public notice with this information and reopen the public comment period.**

The public notice was not deficient as there is no legal requirement for a public notice on a PSD permit to include the information requested by this comment. The relevant rules, 40 CFR 124.10(d)(iii), only require a brief description of the activities conducted at the source. The public notice adequately described the proposed Corn Belt facility as it identified the facility as a coal-fired power plant with a nominal capacity of 91 megawatts that would be a major source of emissions for SO₂, NO_x, PM, CO and hazardous air pollutants (HAPs). Further detail on the emissions of the proposed facility was available in the project summary and draft permit prepared by the Illinois EPA. These documents were readily available to the public as they were posted on the Internet.

- 25. Since the BACT determination in the draft permit for the proposed boiler was deficient as addressed by my comments on the BACT determination for condensable particulate matter, beryllium, and startup and shutdown, the Illinois EPA should prepare a new draft permit and reopen the public comment period.**

As explained in its individual responses to comments, provided above, the Illinois EPA does not consider the BACT determination for the proposed boiler to be deficient. Enhancements to the permit as a result of public comment do not require the Agency to re-notice a draft permit.

- 26. I would like the Illinois EPA to assemble a catalog identifying comments made on the Corn Belt application and all prior written communications received or sent by the Illinois EPA on the application. This catalog should be made available on the Illinois EPA's Internet site.**

There is no legal requirement to prepare a "catalog of information" as requested by this comment. A copy of the transcript from the public hearing was posted on the Internet when it became available. Given the nature of other public interest expressed in this application, the Illinois EPA also does not believe that preparation of such a catalog is justified. Only two written public comments were received on the application, one from Valley Watch, Inc., in Evansville, Indiana (one page), and the other from a private citizen (nine pages). Copies of this material and material in Corn Belt's application, including written communications as described above, are available by written request to the Illinois EPA under the process set forth by Illinois' Freedom of Information Act.

General Questions

27. Did the Illinois EPA request an environmental assessment under 40 CFR 1508.12 for the proposed facility? If not, why?

No. The material in such an assessment would not be relevant to the matters over which the Illinois EPA has authority in permitting. In addition, the location of this proposed facility at the existing coal mine in Elkhart did not pose concerns about impacts on unique ecological areas in Illinois.

FOR ADDITIONAL INFORMATION

Questions about the public hearing and permit decision should be directed as follows:

Public Hearing Procedures and Exhibits

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Responsiveness Summary (question on or extra copies)

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