Illinois Environmental Protection Agency
1021 North Grand Avenue East
Springfield, Illinois

Project Summary for an Application from Kincaid Generation, LLC for a Federally Enforceable Permit for Two Existing Electrical Generating Units to Address Best Available Retrofit Technology (BART)

Site Identification No.: 021814AAB
Application No.: 09050022
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Schedule:
Public Comment Period Begins: December 15, 2010
Public Comment Period Closes: January 14, 2011

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I. INTRODUCTION

Kincaid Generation, L.L.C., (Kincaid) has applied to the Illinois EPA for a permit that would address its obligation to use Best Available Retrofit Technology (BART) on the two electrical generating units, Kincaid 1 and 2, at the coal-fired power plant on Lake Sanchris. Under Section 169A of the federal Clean Air Act, BART must be used on these generating units for control of emissions of sulfur dioxide (SO_2) and nitrogen oxides (NOx) to address the role of these units in visibility impairment and regional haze.

The Illinois EPA has reviewed Kincaid's application and made a preliminary determination that the application meets applicable requirements for a permit to be issued. Accordingly, the Illinois EPA has prepared a draft of the permit that it would propose to issue. Before issuing this permit, Illinois EPA is holding a public comment period to receive comments on the proposed issuance of this permit and the terms and conditions of the draft permit. It is intended that this permit would be federally enforceable, permanently binding Kincaid to new emission limits and requirements that reflect BART in a manner that would be enforceable under both state and federal law.

II. BACKGROUND ON VISIBILITY IMPAIRMENT AND REGIONAL HAZE

In an effort to restore scenic vistas or "visibility" in certain national parks and large federal wilderness areas, Section 169A of the federal Clean Air Act, Visibility Protection for Federal Class I Areas, requires certain actions be taken to remedy existing visibility impairment and to prevent future impairment of visibility due to man-made air pollution. The particular areas addressed by these requirements are areas that were designated as Class I Areas by Section 162 of the Clean Air Act, under the federal program for Prevention of Significant Deterioration of Air Quality. For Illinois, the areas of particular concern are located in neighboring states, namely Mammoth Cave National Park in west central Kentucky, the Mingo Wilderness Area in southeastern Missouri, and Isle Royale National Park in the far northwest of Michigan. Degradation of scenic vistas or visibility impairment in the subject areas is to be remedied by various measures, including application of Best Available Retrofit Technology (BART) [1] to certain existing major sources that began operation between August 7, 1962, and August 7, 1977, to control their emissions of pollutants that significantly contribute to visibility impairment in the subject areas. Section 169A of the Clean Air Act is implemented through rules adopted by USEPA , 40 CFR Part 51, Subpart P, Visibility Protection (the Regional Haze Rule). BART is

[1] As defined by 40 CFR 51.3010, "Best Available Retrofit Technology (BART) means an emission limitation based on the degree of reduction achievable through the application of the best system of continuous emission reduction for each pollutant which is emitted by an existing stationary facility. The emission limitation must be established, on a case-by-case basis, taking into consideration the technology available, the costs of compliance, the energy and nonair quality environmental impacts of compliance, any pollution control equipment in use or in existence at the source, the remaining useful life of the source, and the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology."

further addressed by USEPA in 40 CFR Part 51, Appendix Y "Guidelines for BART Determinations Under the Regional Haze Rule," (BART Guidelines).

The Illinois EPA has developed a plan for Illinois to comply with Section 169A of the Clean Air Act and the Regional Haze Rule. Under the Regional Haze Rule, 40 CFR 51.308, the core requirements for this plan include reasonable progress goals for reductions in emissions, calculations of baseline and natural visibility conditions, long-term strategy to address visibility impairment, and BART requirements for the sources whose emissions must be controlled with BART. The Illinois EPA has developed the proposed plan for Illinois to address regional haze and visibility impairment working in consultation with the States of Indiana, Michigan, Ohio, and Wisconsin as these states must also develop plans to comply with the Regional Haze Rule. The Regional Haze Rule requires consultation between the states, tribes, and the Federal Land Managers (FLMs) responsible for managing Class I areas. This multi-state and multi-agency consultation process has been facilitated by Regional Planning Organizations (RPOs) established specifically for this purpose. Illinois fully participated in the planning and technical development efforts of the Midwest Regional Planning Organization (MRPO), which was formed by Illinois, Indiana, Michigan, Ohio, and Wisconsin. Illinois has also participated in consultations with other RPOs and other states that have requested its participation in their planning process.

As part of the development of this plan, visibility modeling was conducted as needed to determine current impacts of on visibility in Class I areas of sources in Illinois that are potentially subject to BART and the improvements in visibility that would accompany use of BART. The modeling approach was developed in consultation with the MRPO, the MRPO states themselves, the USEPA, and participating FLMs. The modeling has shown that the emissions of NOx and SO_2[2] of certain BART-eligible sources in Illinois are causing or contributing to visibility impairment in certain Class I areas, particularly the Mammoth Cave National Park in Kentucky, the Mingo Wilderness Area in Missouri, Isle Royale National Park in Michigan, and others. The Illinois EPA is therefore required to develop a Regional Haze Plan for Illinois that addresses those sources, requiring them to apply BART for emissions of NOx and SO_2 or provide equivalent or greater emission reductions.

The plan that has been developed by the Illinois EPA is currently the subject of a public comment period. This plan and underlying analysis is described by the Illinois EPA in "Draft Technical Support Document: Regional Haze State Implementation Plan for Illinois," AQPSTR 10-08, October 7, 2010. After considering all comments that are submitted on the proposed plan, the Illinois EPA must submit a final Regional Haze Plan to the USEPA for its approval as a revision to Illinois' State Implementation Plan (SIP).

[2] The visibility modeling showed that the impacts on all Class I areas from particulate matter emissions from only the BART-eligible sources in the MRPO states were not significant, being much less than 0.5 deci-views. Since the particulate matter emissions from just the BART-eligible sources represent a fraction of the total particulate matter emissions from all stationary sources, the Illinois EPA did not include emissions of particulate matter in the BART review process for sources in Illinois.

The proposed determinations of BART for the various subject sources in Illinois that must be addressed by Illinois' Regional Haze Plan are generally discussed by the Illinois EPA in its "Draft Technical Support Document for Best Available Control Technology under the Regional Haze Rule," AQPSTR 09-06, September 30, 2010 (Draft TSD for BART). Control requirements are already in place for most of the subject sources that provide greater reductions in emissions than would be provided with BART. For example, a number of sources are subject to stringent provisions in federal consent decrees that require greater emission reductions than would be achieved with BART.[3] However, the necessary BART control requirements pursuant to the Regional Haze Rule are not in place for certain subject sources in Illinois, including the two electrical generating units at the Kincaid power plant.

The BART control requirements for Kincaid's electrical generating units are addressed in a Memorandum of Understanding between Kincaid and the Illinois EPA (Agreement).[4] The requirements that were agreed to would provide significant reductions in the NOx and SO_2 emissions of Kincaid's electrical generating units. The new emission limits and requirements for these units will provide reduction in emissions that will be greater than if the units complied with the presumptive requirements for BART established by USEPA in its BART Guidelines. The purpose of the proposed permit would be to "memorialize" the emission limits and requirements in the agreement so that they are permanent and can be enforced under both state and federal law.

III. BEST AVAILABLE CONTROL TECHNOLOGY (BART) FOR KINCAID UNITS 1 AND 2

A case-by-case determination of BART must be made for both of the generating units at the Kincaid power plant. These generating units each have a nominal capacity of approximately 600 MW. They are currently fired with Powder River Basin coal that is transported to the plant by unit trains. Both units are cyclone-fired, with the coal being burned in cyclone-type burners. The emission control train for these units includes selective catalytic reduction (SCR) for control of NOx emissions and electrostatic precipitators for control of particulate emissions. The SCR systems are less than ten years old.

To provide BART for emissions of NOx, Kincaid has agreed, beginning March 1, 2013, to operate the existing SCR systems on Kincaid 1 and 2 to comply with an annual average NOx emissions rate of 0.07 lb/mmBtu. The SCR systems on these units will have to be operated on a year-round basis to comply with these emission rates, rather than on a seasonal basis. Annual use of SCR systems is consistent with the BART Guidelines, in which USEPA establishes SCR technology as the presumptive control technology for NOx emissions from cyclone-fired generating units.

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[3] The Illinois EPA has addressed the individual determinations of BART for the various subject sources in Illinois in "Draft Technical Support Document for Best Available Retrofit Technology under the Regional Haze Rule," AQPSTR 09-06, September 30, 2010.

[4] This agreement is between the Illinois EPA and Dominion Energy Services as the operator, and the Permittee, as the owner of the Kincaid Station (collectively "Dominion"), "Memorandum of Understanding on NOx and SO2 Emission Reductions Reflective of Best Available Retrofit Technology for Kincaid Units 1 and 2 between the Illinois Environmental Protection Agency and Dominion," March 3, 2009.

The BART Guidelines also establish a presumptive BART limit for NOx that would be applicable to these units.[5] The NOx rate that would be set for Kincaid Units 1 and 2 would be significantly more stringent than the presumptive NOx limit recommended by the BART Guidelines, 0.07 lb/mmBtu compared to 0.10 lb/mmBtu. A limit of 0.07 lb/mmBtu is more reflective of the emission limits that currently being set for new coal-fired generating units with new SCR systems. A period of time is provided before this new limit would take effect for the Kincaid units because some operational changes, and possibly physical changes, would be needed to the existing SCR systems to comply with this limit.

To provide BART for emissions of SO_2, Kincaid has agreed to install SO_2 control equipment on Kincaid Units 1 and 2 and comply with an annual average SO_2 emissions rate of 0.20 lb/mmBtu beginning in 2014. In 2017, the SO_2 emission rate would become 0.18 lb/mmBtu. For this purpose, Kincaid would install systems that would be designed to inject Trona (a mineral form of sodium carbonate) into the duct work to absorb and remove SO_2 from the flue gas. The sorbent would then be removed from the flue gas by the existing precipitators. The capital cost of these new systems would be substantially less than that of the installation of either wet or dry scrubbers on the units to control emissions of SO_2. The installation of Trona systems would also entail less interruption in the routine operations of the units than installation of scrubbers.

For SO_2, the emission limits proposed as BART would not meet the presumptive limits in the BART Guidelines.[6] To support its proposal for BART, Kincaid prepared a detailed source-specific analysis, "BART Analysis for the Kincaid Power Plant," January 2009. The analysis finds that the final emission rates that would be set as BART for SO_2 and NOx would entail total annual costs that would be less than half those associated with installation of either dry or wet scrubbers and would provide essentially identical results for improvements in visibility in the two nearest Class I Areas, Mammoth Cave National Park and the Mingo Wilderness.

The effects on visibility resulting from the limits proposed as BART for Kincaid were also evaluated by the Illinois EPA, considering other relevant Class I Areas in addition to the two areas addressed by Kincaid's evaluation. The results of the Illinois EPA's evaluation are provided in the Illinois EPA's Draft TSD for BART. The Kincaid's proposal for BART was determined to provide equivalent improvements to visibility as the presumptive limits in the BART Guidelines.

The reductions in NOx and SO_2 emissions expected from application of the BART limits that would be set for Kincaid Units 1 and 2 were also presented in the Illinois EPA's Draft TSD for BART. The reduction in emissions, as provided in attached Tables 1 and 2, was determined to be greater than would be achieved with presumptive BART control requirements.

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[5]For cyclone-fired generating units, the BART Guidelines recommend a presumptive NOx limit of 0.10 lb/mmBtu for units with a capacity of more than 200 MW.

[6]For generating units, the BART Guidelines recommend a presumptive control level for SO_2 emissions of either 95 percent control or 0.15 lb/mmBtu for units with a capacity of more than 200 MW.

X. PERMIT CONDITIONS

The proposed permit would set forth the air pollution control requirements that Kincaid must meet to satisfy its obligation to use BART on subject units. This includes the new limits for Kincaid Units 1 and 2 for emission of NOx and SO_2, with effective dates. The permit would also provide that continuous emissions monitoring data, as collected under applicable federal regulations that apply to Kincaid 1 and 2, would be used to determine compliance with the new limits. The permit would also require periodic reporting for these new limits. The proposed permit would not address other existing air pollution control requirements that apply to Kincaid 1 or 2, which are either in effect as a matter of rule or addressed in other permits.

It is intended that this permit would be federally enforceable, permanently binding Kincaid to the new requirements for BART in a manner that would be enforceable under both state and federal law. As the existing power plant is a major source under Illinois' Clean Air Act Permit Program (CAAPP),[7] the new requirements established in the permit for Kincaid 1 and 2 would become applicable Clean Air Act requirements that would have to be included in future CAAPP permits that cover these units.

XI. REQUEST FOR COMMENTS

It is the Illinois EPA's preliminary determination that the application for the requested permit meets applicable regulatory requirements. The Illinois EPA is therefore proposing to issue a permit to Kincaid to address BART. Comments are requested on this proposed action by Illinois EPA and the conditions of the draft permit.

[7] The Clean Air Act Permit Program (CAAPP) is Illinois federal operating permit program for major sources of emissions pursuant to Title V of the federal Clean Air Act.

Table 1: Comparison of NOx Reductions from Presumptive BART and the Agreement

Note: As the Agreement provides a limit for Kincaid Units 1 and 2, combined, the limits shown below for the NOx emission rates do not represent unit-specific limits.

Generating Unit	Base Year 2002			Presumptive BART		Agreement	
	Heat Input	Actual NOx Rate	NOx Emissions	NOx Limit	NOx Reduction	NOx Limit	NOx Reduction
	1000 mmBtu	lb/mmBtu	Tons	lb/mmBtu	Tons/Yr	lbs/mmBtu	Tons/Yr
Kincaid 1	32,265	0.64	10,300	0.10	8,686	0.07	9,171
Kincaid 2	32,238	0.65	10,605	0.10	8,993	0.07	9,476
Totals			20,905		**17,679**		**18,648**

Table 2: Comparison of SO_2 Reductions from Presumptive BART and the Agreement

Note: As the Agreement provides a limit for Kincaid Units 1 and 2, combined, the limits shown below for the SO_2 emission rates do not represent unit-specific limits.

Generating Unit	Base Year 2002			Presumptive BART		Agreement in 2015		Agreement Final	
	Heat Input	Actual SO_2 Rate	SO_2 Emissions	SO_2 Limit	SO_2 Reduction	SO_2 Limit	SO_2 Reduction	SO_2 Limit	SO_2 Reduction
	1000 mmBtu	lb/mmBtu	Tons	lb/mmBtu	Tons/Yr	lbs/mmBtu	Tons/Yr	lb/mmBtu	Tons/Yr
Kincaid 1	32,265	0.55*	8,891	0.15**	6,471	0.20	5,665	0.18	5,987
Kincaid 2	32,238	0.54*	8,774	0.15**	6,356	0.20	5,550	0.18	5,873
Totals			17,665		**12,827**		**11,215**		**11,860**

* Actual SO_2 emission rate reflecting level of control with the scrubber in 2002.

** Presumptive BACT limit based on an SO_2 emission rate of 0.15 pound per mmBtu.