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State Office of Administrative Hearings

Shelia Bailey Taylor
Chief Administrative Law Judge

August 23, 2006

Derek Seal, General Counsel
Texas Commission on Environmental Quality
PO Box 13087
Austin Texas 78711-3087

Re: ***SOAH Docket No. 582-06-1502; TCEQ Docket No. 2006-0195-AIR;*** **Application of Oak Grove Management Company LLC for Proposed Air Permit No. 76474 and PSD-TX-1056**

Dear Mr. Seal:

The above-referenced matter will be considered by the Texas Commission on Environmental Quality on a date and time to be determined by the Chief Clerk's Office in Room 201S of Building E, 12118 N. Interstate 35, Austin, Texas.

Enclosed are copies of the Proposal for Decision and Order that have been recommended to the Commission for approval. Any party may file exceptions or briefs by filing the original documents with the Chief Clerk of the Texas Commission on Environmental Quality no later than **September 12, 2006**. Any replies to exceptions or briefs must be filed in the same manner no later than **September 22, 2006**.

This matter has been designated **TCEQ Docket No. 2006-0195-AIR; SOAH Docket No. 582-06-1502**. All documents to be filed must clearly reference these assigned docket numbers. Copies of all exceptions, briefs and replies must be served promptly on the State Office of Administrative Hearings and all parties. Certification of service to the above parties and an **original and eleven copies** shall be furnished to the Chief Clerk of the Commission. Failure to provide copies may be grounds for withholding consideration of the pleadings.

Sincerely,

Carol Wood

Carol Wood
Administrative Law Judge

Thomas H. Walston

Thomas H. Walston
Administrative Law Judge

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COMMISSION ON ENVIRONMENTAL QUALITY

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STYLE/CASE: OAK GROVE MANAGEMENT CO LLC

SOAH DOCKET NUMBER: 582-06-1502

REFERRING AGENCY CASE: 2006-0195-AIR

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SOAH DOCKET NO. 582-06-1502
TCEQ DOCKET NO. 2006-0195-AIR

APPLICATION OF OAK GROVE MANAGEMENT COMPANY, LLC FOR PROPOSED AIR QUALITY PERMIT NO. 76474 AND AIR QUALITY PERMIT NO. PSD-TX-1056	§ § § § §	BEFORE THE STATE OFFICE OF ADMINISTRATIVE HEARINGS

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SOAH DOCKET NO. 582-06-1502
TCEQ DOCKET NO. 2006-0195-AIR

APPLICATION OF OAK GROVE MANAGEMENT COMPANY, LLC FOR PROPOSED AIR QUALITY PERMIT NO. 76474 AND AIR QUALITY PERMIT NO. PSD-TX-1056	§ § § § §	**BEFORE THE STATE OFFICE OF ADMINISTRATIVE HEARINGS**

PROPOSAL FOR DECISION

I. INTRODUCTION

Oak Grove Management Company, LLC (Oak Grove or Applicant) has applied to the Texas Commission on Environmental Quality (TCEQ or Commission) for Air Quality Permit No. 76474 and Prevention of Significant Deterioration (PSD) Air Quality Permit No. PSD-TX-1056 authorizing the construction and operation of two lignite-fired, 800 net megawatt (MW) electric generating units to be called Oak Grove Steam Electric Station (Station), about 12 miles north of Franklin in Robertson County, Texas. A PSD permit is required because the Station would be a major new source of emissions located in an attainment area.

The application, subject to Executive Order RP49 issued by the Governor of Texas on October 27, 2005, is contested by Robertson County: Our Land, Our Lives (Protestant), a non-profit organization of property owners organized to contest the application. Specifically, Protestant and the Commission's Public Interest Counsel (PIC) argue that Applicant failed to demonstrate that the Station will employ the best available control technology (BACT) for reducing or eliminating the nitrogen oxides (NO_x) and mercury (Hg) emissions resulting from the facility. Protestant and the PIC also assert that Applicant failed to demonstrate compliance with the federal PSD requirements, which require an impact analysis that the source will not cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS).

The Administrative Law Judges (ALJs) recommend the Commission find that Oak Grove has failed to prove by a preponderance of the evidence that its BACT proposals for controlling NO_x

and mercury emissions are technically practicable and would achieve the performance standards contained in the application and draft permit. The ALJs find that Oak Grove failed to prove by a preponderance of the evidence that its proposed source would not cause or contribute to a condition of air pollution. For these reasons, the ALJs recommend that the Commission deny Oak Grove's application for an air quality permit.

II. JURISDICTION AND PROCEDURAL HISTORY

Oak Grove filed its application on July 27, 2005, which was subsequently updated. On February 21, 2006, the Commission's Executive Director (ED) completed technical review of the application and issued a preliminary decision and draft permit. At Oak Grove's request, the Commission on February 22, 2006, directly referred the application to the State Office of Administrative Hearings (SOAH) for a hearing on whether it complied with all applicable statutory and regulatory requirements.

ALJs Carol Wood and Tom Walston conducted a preliminary hearing on April 3, 2006, in Franklin, Texas. After determining proper notice had been given, the ALJs designated Oak Grove (represented by John Riley), the ED (represented by Erin Selvera), the PIC (represented by Christina Mann), and Protestant (represented by Wendi Hammond) as parties to the proceeding. The ALJs conducted the hearing on the merits in Austin, Texas, from June 13 through June 20, 2006. After submitting final arguments, the record closed on July 10, 2006.

III. FACILITY DESCRIPTION

Oak Grove is an affiliate of TXU Corporation (TXU). The proposed Station would be a new, 1,600 MW net electric output, pulverized coal (PC) boiler steam electric generating facility. Two supercritical cycle steam boilers would be used, each with a maximum heat input of 8,970 million British thermal units per hour (MMBtu/hr) and generator gross output of 860 MW. The primary fuel

would be Texas lignite from three area mines owned by TXU and sent to the plant via a dedicated railroad. Low-sulfur fuel oil is proposed to be used for boiler startups and, occasionally, flame stabilization.[1]

Emissions from the PC boilers are proposed to be controlled with combustion controls for NO_x, carbon monoxide (CO), and volatile organic compounds (VOCs), including low-NO_x burners and over-fired air for NO_x; selective catalytic reduction (SCR) for additional NO_x control; wet flue gas desulfurization (FGD) for control of sulfur dioxide (SO_2) and acid gases [hydrogen chloride (HCl), sulfuric acid (H_2SO_4), and hydrogen fluoride (HF)]; treated activated carbon injection for mercury (Hg); and a fabric filter dust collection system for particulate matter (PM), including particulate matter smaller than 10 microns (PM_{10}).[2]

Ancillary equipment includes the following: lignite, fuel oil, diesel fuel, limestone, ammonia, activated carbon, water, and ash storage and handling equipment; water treating equipment; steam condensers; two 260.5 MMBtu/hr fuel-oil-fired auxiliary boilers; a 1,444 horsepower (hp) diesel engine emergency generator with a small wet cooling tower; and a 350 hp diesel engine emergency fire pump.[3]

IV. APPLICABLE LAW

In pertinent part, TEX. HEALTH & SAFETY CODE (Health & Safety Code) § 382.0518(b) states the following:

> The commission shall grant . . . a permit . . . to construct a facility if, from the information available to the commission . . . the commission finds:

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[1] Oak Grove Ex. 7 at 4.

[2] *Id.*

[3] *Id.*

(1) the proposed facility for which a permit. . . is sought will use at least the best available control technology, considering the technical practicability and economic reasonableness of reducing or eliminating the emissions resulting from the facility; and

(2) no indication that the emissions from the facility will contravene the intent of this chapter [Clean Air Act], including protection of the public's health and physical property.

Pursuant to the pertinent portions of 30 TEX. ADMIN. CODE (TAC) § 116.111, an applicant for an air quality permit must include the following in its application:

(2) Information which demonstrates that emissions from the facility. . . meet . . .

(C) Best available control technology (BACT). The proposed facility will utilize BACT, with consideration given to the technical practicability and economic reasonableness of reducing or eliminating the emissions from the facility.

* * *

(G) Performance demonstration. The proposed facility will achieve the performance specified in the permit application. . . .

In pertinent part, 40 C.F.R. § 52.21(k) states the following:

Source Impact Analysis. The owner or operator of the proposed source. . . shall demonstrate that allowable emission increases from the proposed source. . . , in conjunction with all other applicable emission increases or reductions (including secondary emissions), would not cause or contribute to air pollution in violation of:

(1) Any [NAAQS] in any air quality control region; or

(2) Any applicable maximum allowable increase over the baseline concentration in any area.

30 TAC § 116.160, "Prevention of Significant Deterioration Requirements," reads in pertinent part as follows:

(a) Each proposed new major source. . . in an attainment or unclassifiable area shall comply with the requirements of this section. The owner or operator of a proposed new. . . facility that will be a new major

> stationary source for the prevention of significant deterioration [PSD] air contaminant shall meet the additional requirements of subsection (c)(1) - (4) of this section.
>
> * * *
>
> (c) (2) The following requirements from [PSD] of air quality regulations promulgated by the [United States Environmental Protection Agency (EPA)] in [Title 40 Code of Federal Regulations (CFR) at] 40 CFR § 52.21. . . are hereby incorporated by reference:
>
> * * *
>
> (C) 40 CFR § 52.21(k), concerning source impact analysis. . . .

V. BACKGROUND

The TCEQ document entitled "Evaluating Best Available Control Technology (BACT) in Air Permit Applications" sets forth the guidance for evaluation of BACT proposals submitted in a New Source Review (NSR) air permit application. According to this document, the process for a permit reviewer to determine the "technical practicability and economic reasonableness" of a BACT proposal involves resolving questions such as: "*Has the proposal been demonstrated to work based on actual operation? Can the proposal reasonably be expected to work based on technical analysis?*"[4]

The guidance document notes that the TCEQ BACT evaluation is conducted using a "tiered" analysis approach. A **Tier I** evaluation involves "a comparison of the applicant's BACT proposal to emission reduction performance levels accepted as BACT in recent permit review. In some cases, evaluation of new technical developments may also be necessary."[5] The **Tier II** evaluation involves "consideration of controls that have been accepted as BACT in recent permits for similar air emission streams in a different process or industry."[6] A **Tier III** evaluation "is a detailed technical

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[4] Oak Grove Ex. 15 at 5. (Emphasis added.)

[5] Oak Grove Ex. 15 at 6.

[6] *Id.*

and quantitative economic analysis of all emission reduction options available for the process under review. *Technical practicability is established through demonstrated success of an emission reduction option based on previous use, and/or engineering evaluation of a new technology.*"[7]

Oak Grove Exhibit 37 (attached as Attachment A) is a schematic setting forth the proposed boiler and "key environmental components" for the Station, which includes the following: SCR NO_x control reactor, air heater, fabric filter for PM control, and FGD for SO_2 control. Oak Grove's expert witness, Edward Cichanowicz, a mechanical engineer, described how gas proceeds through the components shown on the exhibit, as follows: "After the gas leaves the boiler and goes through the SCR and gets to the air heater at about 350 degrees Fahrenheit, it goes into a fabric filter-type particulate control environment, and then essentially the gas will be virtually liberated of ash and goes to the flue gas desulfurization for SO_2. . . . [A]ctivated carbon is injected into the inlet of the fabric filter. It collects on the filter itself and builds up in a filter cake. And as the gas goes across this cake, the high surface area of the activated carbon can pull out mercury. . . . Then it becomes particulate and is removed–basically into the ash effluent."[8]

VI. MAJOR ISSUES

A. Whether Oak Grove proved by a preponderance of the evidence that its BACT proposal of using SCR with lignite-fired boilers to control NO_x is technically practicable and would achieve the performance standards contained in the application and draft permit.

The ALJs recommend the Commission find that Oak Grove has failed to prove by a preponderance of the evidence that its BACT proposal of using SCR with lignite-fired boilers to control NO_x is technically practicable and would achieve the performance standards contained in the application and draft permit.

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[7] Oak Grove Ex. 15 at 5-6. (Emphasis added.)

[8] Tr.v.3 at 471-472.

1. Background

As noted above in the facility description, Oak Grove proposes to control NO_x with low-NO_x burners, over-fired air, and SCR.[9] Special Condition No. 50 of the draft permit sets out a "NO_x optimization" requirement. For the first two years of operation, the Station's two PC boilers (the Units) will be subject to a NO_x emission limit of 0.08 lb/MMBtu, as measured on both a 30-day rolling and an annual average basis.[10] During this two-year period, Oak Grove is to study the operational capability of the SCR system at emission levels below 0.08 lb/MMBtu. At the end of the two-year operational period, Oak Grove must submit a written report of the results of the study to TCEQ and request to alter the permit to lower the 0.08 lb NO_x/MMBtu limit *"if the study demonstrates that a lower rate is justified based on SCR performance* with typical and expected maintenance and operational effects."[11]

A comparison of the NO_x emission limits of the two most recently permitted pulverized coal-fired electric generating facilities, Sandy Creek Energy Station (Sandy Creek) and City Public Service Spruce 2 (CPS), with that of the proposed Oak Grove facility shows the following: measured on a 30-day average, the Sandy Creek facility has a permitted rate of 0.07 lb/MMBtu, the CPS facility has 0.069 lb/MMBtu, and the Oak Grove facility has a proposed rate of 0.08 lb/MMBtu. The hourly limits of NO_x emissions for all three facilities are identical at 0.2 lb/MMBtu. However, as measured on an annual average basis, the Oak Grove limit of 0.08 lb/MMBtu exceeds the annual values of 0.05 lb/MMBtu permitted for both Sandy Creek and CPS by 60 percent.[12] Unlike the

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[9] SCR involves injecting ammonia into the boiler flue gas in the presence of a catalyst to reduce NO_x to nitrogen (N_2) and water. The catalyst is a dry chemical substance coating the surface of a series of three honey-comb-style metal grates, through which the NO_x and ammonia must simultaneously pass and contact the catalyst for the NO_x reduction chemical reaction to occur.

[10] Oak Grove Ex. 35 at 12.

[11] Oak Grove Ex. 14 at 28. (Emphasis added.)

[12] Oak Grove Ex. 35 at 13-14.

proposed Oak Grove facility, both Sandy Creek and CPS will utilize Powder River Basin (PRB) subbituminous coal.

2. Oak Grove's Argument

Oak Grove argues that, in performing its BACT analysis, it first determined an appropriate "suite of controls" for the Station's PC boilers. Oak Grove notes that, by reviewing recently approved permits for other pulverized-coal-fired boilers "similar to those that will be used at the Station," it performed a Tier I investigation to identify the appropriate suite of controls.[13] Specifically, Oak Grove points out that it reviewed the permits for Sandy Creek and CPS, both of which will employ pulverized-coal-fired technology.[14] Applicant contends that, because pulverized-coal and pulverized-lignite boilers constitute the same process, a Tier I BACT analysis was appropriate. The following illustrates the suite of controls proposed for the Station's Units compared to those approved by the Commission for the Sandy Creek and CPS units:

BACT COMPARISON

Air Contaminant	City Public Service	Sandy Creek	Oak Grove
NO_x	SCR Low-NO_x Burners Over-Fired Air	SCR Low-NO_x Burners Over-Fired Air	SCR Low-NO_x Burners Over-Fired Air
Hg	Wet FGD Fabric filters SCR	Dry FGD Fabric Filters SCR Carbon Injection	Wet FGD Fabric Filters SCR Carbon Injection

[13] Oak Grove Ex. 1 at 60-61.

[14] Oak Grove Ex. 1 at 61.

Once the appropriate suite of controls for the Units had been determined, Oak Grove states it undertook an evaluation, "best categorized as a Tier III review," to identify the lowest NO_x and Hg emission limits technically practicable for its pulverized lignite-fired boilers (the Units) employing those controls.

Oak Grove asserts that the 0.08 lb/MMBtu NO_x emission limit, coupled with the optimization requirement established in the draft permit, represents BACT for the Units. Applicant acknowledges that the permits for the subbituminous, PRB coal-fired boilers of Sandy Creek and CPS contain an annual NO_x emission limit of 0.05 lb NO_x/MMBtu. However, argues Oak Grove, even though the Sandy Creek and CPS PC boilers will employ the same process, they will not fire Texas lignite coal. For this reason, Oak Grove states that TCEQ's BACT review process required it to identify unique technically practicable emission limits for the Units. Applicant contends that, because Texas lignite produces higher uncontrolled emissions of some air contaminants per MMBtu than the subbituminous coals that will be fired in the Sandy Creek and CPS boilers, the selection of emissions limits reflective of BACT for the pollutants that will be emitted from the Units must take into consideration the unique properties of lignite fuel.

Oak Grove argues that several factors have been identified regarding "the unique characteristics of lignite," which impact the technical capability of SCR to reduce NO_x to the 0.05 lb/MMBtu level. First, Oak Grove points out that Texas lignite produces higher NO_x levels in the furnace than subbituminous coal. Second, Applicant admits that lignite's higher ash content creates greater plugging potential in the SCR catalyst, thereby potentially decreasing the amount of post-combustion NO_x control. Third, Oak Grove points out that the chemical composition of lignite may cause early deactivation of the SCR catalyst. Oak Grove asserts that these factors, as well as the additional factor that no operating PC boilers are firing Texas lignite and using SCR, make the ultimate NO_x emissions level achievable for the Units more uncertain.[15] Therefore, argues Oak Grove, while it is proper to compare the control technologies to be used for the Sandy Creek and

[15] Oak Grove Ex. 1 at 73.

CPS boilers to those proposed for the Station's Units, a direct comparison of the resulting emissions limits is inappropriate.

After discussions with TCEQ staff and review of the uncertainties, Applicant contends BACT for the lignite-fired Units was determined to be installation of SCR reactors that Oak Grove will specify through vendor guarantees to be capable of achieving a NO_x emission limit of 0.05 lb/MMBtu. However, notes Oak Grove, because this will be the first application of SCR on Texas lignite and Applicant anticipates difficulty in meeting a 0.05 lb/MMBtu limit on a continuous basis without severely affecting unit operating capacity and availability, the two-phase NO_x limit was developed and established in the draft permit as Special Condition No. 50 ("NO_x Optimization").

Applicant asserts that the expert testimony at hearing provides justification for the proposed NO_x emission limit of 0.08 lb/MMBtu. Oak Grove points out that, as part of his review of the suite of NO_x emissions control technologies proposed for the Units, Mr. Cichanowicz evaluated the proposed NO_x emission limit. Taking into account the initial NO_x rates that will be generated by the Units and the challenges posed by firing lignite, Applicant notes Mr. Cichanowicz concluded that the 0.08 lb/MMBtu NO_x emission limit represents BACT.[16] In reaching this conclusion, Oak Grove states that Mr. Cichanowicz first looked at the average expected NO_x emission rate for the lignite-fired boilers (0.22 lb/MMBtu), applied the SCR NO_x removal efficiency that has been achieved by Texas Genco's W.A. Parish coal-fired units (65 percent), and arrived at the permit limit of 0.08 lb/MMBtu.[17] Relying on Mr. Cichanowicz's testimony, Oak Grove argues this level of NO_x removal is consistent with an SCR reactor and catalyst inventory designed for 80 to 85 percent NO_x removal, but incurring a level of catalyst blockage that Mr. Cichanowicz has personally witnessed on PRB coal-fired units.[18]

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[16] Oak Grove Ex. 35 at 21-23, 24.

[17] Oak Grove Ex. 35 at 22.

[18] Oak Grove Ex. 35 at 22-23.

Oak Grove further asserts that Mr. Cichanowicz verified the appropriateness of the 0.08 lb/MMBtu NO_x emission limit using a process model.[19] Applicant points out that, for model inputs, Mr. Cichanowicz used the midpoint NO_x emission rate for the lignite-fired boilers (0.22 lb/MMBtu); "a generous quantity of catalyst;" and assumed, based on his personal experience inspecting SCRs, that 20 percent of the catalyst would be blocked by ash.[20] The model result, notes Oak Grove, was a NO_x emission rate of 0.08 lb/MMBtu.[21]

In addition to Mr. Cichanowicz, Oak Grove argues that its expert witness, Larry Moon, senior project manager for the project, testified that he supported the NO_x emission limit set forth in the draft permit, as did TCEQ's permit engineer, Randy Hamilton, in his prefiled testimony.

Applicant further asserts that, during the first two years of the Station's operation, while the Units are subject to a NO_x emission limit of 0.08 lb/MMBtu and Oak Grove and the selected SCR vendor optimize the performance of the SCR, Oak Grove would have "multiple incentives" to minimize NO_x emissions.[22] Mr. Moon testified that, because the Units will be subject to the new federal NO_x cap and trade program beginning in 2009, Oak Grove has a strong economic incentive to achieve the highest possible NO_x removal efficiency.[23] Additionally, the environmental director for TXU Power,[24] Paul Zweiacker, Ph.D., testified that, when Oak Grove's units are permitted and come online, TXU's corporate commitment to reduce its total fleet emission of SO_2, NO_x, and mercury by 20 percent below the limit that TXU's nine existing units emitted in 2005 will be an

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[19] Tr. v. 3 at 462-463, 486.

[20] Id.

[21] Tr. v. 3 at 486.

[22] Tr. v.2 at 314-315; Oak Grove Ex. 1 at 74.

[23] Oak Grove Ex. 1 at 74.

[24] TXU Power is a d/b/a of a group of indirect subsidiaries of TXU Energy Company, LLC, which itself is a subsidiary of TXU Corporation. TXU Power owns several power plants and mining operations throughout Texas. (Oak Grove Ex. 31 at 3.)

incentive. As Dr. Zweiacker explained, it is to TXU's benefit to get the NO_x emissions from the Units down as low as possible because, based upon TXU's commitment, for every pound of NO_x that the TXU units emit at this particular site, TXU will have to find a reduction of NO_x somewhere else within its fleet.[25]

Therefore, Oak Grove argues, the draft permit's NO_x optimization provision, coupled with the incentives to minimize NO_x emissions from the Units, "dispels any concern that the initial limit of 0.08 lb/MMBtu is in any way too forgiving."

3. ED's Argument

The ED notes that, regarding TCEQ's final determination of BACT for NO_x in the draft permit, Mr. Hamilton testified that BACT is a case-by-case judgment and the selection of 0.08 lb/MMBtu, with a "ratcheting down provision which may result in a limit below 0.07 lb/MMBtu, is a reasonable BACT determination."[26]

4. Protestant's and PIC's Argument

Both the PIC and Protestant assert that Oak Grove failed to meet its burden in establishing a factual basis for a NO_x emission limit of 0.08 lb/MMBtu for the Units. They contend the record fails to show "any scientific, economic, or environmental basis for the establishment of the 0.08 lb/MMBtu NO_x emission rate," rather than the 0.07 lb/MMBtu recommended by Mr. Hamilton during technical review of Oak Grove's permit application.[27]

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[25] Tr. v. 2 at 291- 292, 314.

[26] ED Ex. 1 at 15.

[27] On January 31, 2006, Mr. Hamilton prepared a "briefing document" for his division director, Richard Hyde, in preparation for a meeting between the TCEQ Executive Director, Glenn Shankle, and Applicant regarding the NO_x BACT emission limit for the Oak Grove Units. (Protestant Ex. 42; Tr. v. 4 at 541.) Although Mr. Hamilton in the briefing document argued that 0.07 lb/MMBtu was the appropriate emission limit (Protestant Ex. 42), Mr. Shankle

The PIC points out that Applicant's engineering expert, Larry Moon, testified regarding the Applicant's BACT determinations. The PIC notes Mr. Moon stated that, in order to determine emission rates, he relied upon rates previously determined by TXU environmental staff and then simply compared those rates to those of other applications. [28] The PIC points out that Oak Grove's initial BACT determination for the NO_x emission rate was 0.10 lb/MMBtu for the 30-day rolling average and annual averaging periods.[29] Thus, argues the PIC, Mr. Moon found the 0.10 lb/MMBtu rate acceptable as BACT even when comparing that rate to lower proposed rates for the same process (PC boilers), because of the "concerns about . . . the ability of the SCR to achieve those levels over a long period of time." [30]

The PIC acknowledges there is a need for a reasonable, actually achievable NO_x permit limit. Nevertheless, argues the PIC, "the record simply does not demonstrate why the value currently proposed and included in the draft permit [0.08 lb/MMBtu] changed from that initially proposed [0.10 lb/MMBtu] or why this rate is different from the rate initially recommended by the ED's permit engineer [Mr. Hamilton]." [31]

5. Analysis

The ALJs find that Oak Grove did not prove by a preponderance of the evidence that its BACT proposal of using SCR with lignite-fired boilers to control NO_x is technically practicable. For that reason, the ALJs recommend the Commission find that Oak Grove failed to prove by a

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decided after meeting with Mr. Hyde and TXU officials that 0.08 lb/MMBtu for NO_x is BACT for the Oak Grove Units. (Tr. v. 4 at 528, 605-606.)

[28] *See generally* Tr.v.1 at 74.

[29] Tr v.1at 74.

[30] Tr v.1 at 75.

[31] PIC's Closing Argument at 5.

preponderance of the evidence that its proposed NO_x control technology–its suite of controls–would achieve a 0.08 lb/MMBtu NO_x emission rate as required by the draft permit.

As noted above, the TCEQ BACT guidance document states that the process for determining the technical practicability of a BACT proposal involves resolving such questions as: "Has the proposal been demonstrated to work based on actual operation? Can the proposal reasonably be expected to work based on technical analysis?"[32] The ALJs find that the answer to the first question is "No." Oak Grove's BACT proposal to use SCR with lignite has not been demonstrated to work *based on actual operation.*

Oak Grove proposes to control NO_x with low-NO_x burners, over-fired air, and SCR. However, *no commercial unit in the nation uses SCR with lignite* as Oak Grove intends. Presently, TXU has nine lignite-fired plants but, unlike the proposed Oak Grove facility, eight of those co-fire PRB coal with the lignite.[33] Moreover, none is equipped with SCR, although TXU plans to add SCR to them in the future.[34] Only a few lignite-fired boilers outside the United States use SCR; however, those that do use SCR are not required to achieve NO_x emission limits as low as Oak Grove's.[35] In short, there are no existing pulverized-lignite-fired, SCR-equipped facilities to corroborate Oak Grove's NO_x emission projections.

Addressing the second question: can Applicant's BACT proposal to control NO_x emissions with SCR reasonably be expected to work based on technical analysis? The ALJs find that Oak Grove failed to show by a preponderance of the evidence that its proposal can reasonably be expected to work.

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[32] Oak Grove Ex. 15 at 5.

[33] Tr. v.4 at 645.

[34] Tr. v.3 at 460.

[35] Oak Grove Ex. 40 at 17.

The evidence at hearing revealed serious problems with controlling NO_x emissions from lignite. All witnesses on this issue testified that use of lignite with low-NO_x burners and SCR will be challenging and uncertain because lignite is a lower grade coal than PRB subbituminous coal, having a lower heating value and higher levels of ash, silica, and moisture. The most serious problem is that the high levels of ash in lignite clog and degrade the SCR; a second concern is reduced performance of the low-NO_x burners and over-fired air with the use of lignite.

TCEQ staff recognized the ash problem with lignite in its Preliminary Determination Summary: "The performance of SCR with lignite coal is of particular concern because ash deposition has been an issue for SCR with the high-ash subbituminous coal fired at the W.A. Parish facilities in Fort Bend County, and lignite has a higher ash content than subbituminous coal."[36] Furthermore, Mr. Hamilton, the permit engineer for this project, stated the following in his prefiled testimony:

> [Oak Grove] will be the first lignite-fired boiler in the United States to operate with [SCR] for NO_x control. Outside the U.S., there are only a few examples of SCR with lignite, and these boilers were not required to achieve emission limits as low as [the Oak Grove facility]. The high ash levels in lignite and potential for catalyst plugging make vendors and owners more cautious about promises of low NO_x levels from lignite-fired boilers compared to boilers firing higher-rank coals. The higher-rank coals all have lower ash, and more operational experience with SCR. The uncertainty with regard to ash deposition is not mathematically convertible to a NO_x emission limit adjustment. The ideal outcome would be that plugging proves to be no problem at all. Under this scenario, NO_x emissions could be as low as any coal-fired boiler and the BACT emission limit could have been lower. The worst outcome would be that the SCR plugs with flyash rapidly and completely and no engineering solution can be found. Under this scenario, SCR would be technically infeasible, and BACT would have to higher [sic], based on the next most effective technology. . . .[37]

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[36] Oak Grove Ex. 6 at 20.

[37] Oak Grove Ex. 40 at 17.

The University of North Dakota (UND) also reported these problems in pilot tests performed with subbituminous and lignite coal. Its report, contained in Oak Grove Exhibit 3A, stated that testing of SCRs with subbituminous and lignite coals showed significant accumulation of ash on the catalyst on both macroscopic and microscopic levels. On a macroscopic level, significant observable accumulations plugged the entrance as well as the exit of catalyst sections. On a microscopic level, ash materials filled pores in the catalyst and, in many cases, completely masked the pores within four months of operation.[38] UND also reported that pressure drop across the catalyst (indicating blockage) was most significant for the lignite plant compared to the subbituminous plants.

Likewise, Oak Grove's expert witness, Mr. Cichanowicz, has acknowledged the serious problems of operating an SCR with lignite. In a memorandum prepared by Mr. Cichanowicz in October 2005, he noted that "the composition of Texas lignite presents a challenge to feasible and reliable SCR operation, due to concerns for both catalyst activity and commercial operation of the process."[39] The following quotes from Mr. Cichanowicz's memorandum explain the challenge of using an SCR with lignite:

- Lignite coal also presents uncertainty in the design and operation of an SCR reactor due to the potential for ash deposits to accumulate within the reactor and restrict flow, further inducing maldistribution in velocity and possibly NH3[ammonia]/NO mixing.[40]

- As an industry, we have learned much in the last 3 years regarding SCR reactor ash deposition with PRB. In my opinion, the PRB experience could be a harbinger of the possible problems in keeping a lignite-fired SCR reactor clean.[41]

- These ash deposition problems are exacerbated by popcorn or large ash (LPA), which are defined as ash particles greater than 4mm and featuring an aspect ration of 1.5 or

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[38] Oak Grove Ex. 3A at 22-23 (Benson, et al., *Ash and Mercury Behavior in SCR Catalysts When Firing Subbituminous and Lignite Coals*, University of North Dakota).

[39] Oak Grove Ex. 3A at 294 (Cichanowicz memo, Oct. 5, 2005, *Lignite Coal SCR Feasibility*).

[40] Oak Grove Ex. 3A at 295.

[41] *Id.*

greater. LPA can significantly plug flow channels within the catalyst, which essentially eliminates the plugged channel from participating in the reaction. Given the evolving experience and limited state of understanding LPA genesis, *I cannot project whether LPA will be manageable for lignite SCR applications. Even with the modest success with different protection screens or baffles, near-complete removal of LPA is required to eliminate it as a concern.*[42]

- The solution to these issues has not been proven with one system design. . . . I believe that numerous variations in the design of turning vanes must be explored, along with various locations of either or both sootblowers and sonic horns, and almost complete elimination of horizontal, flat surfaces within the reactor.[43]

- In summary, the design of an SCR reactor for lignite coal firing will address several issues *that have never been implemented as a complete system, on lignite or any other coal.* This will require (a) a one-year pilot plant test (at 1-3 MW equivalent on the subject lignite coal), (b) the design of aerodynamically slippery surfaces within the reactor internals, and (c) the use of either (or both) sootblowers or sonic horns to remove ash from turning vanes, and (d) extremely low velocity flue gas at the reactor entrance. *A commercial-scale test is required to assure the design specifics and confidences for broad commercial application.*[44]

Oak Grove Exhibit 39 (attached as Attachment B) depicts Mr. Cichanowicz's five "zones of concern" for anticipated lignite deposition in an SCR reactor.[45] The zones of concern include ash sticking to the turning vanes whose job is to uniformly distribute the gas across the catalyst, fallout from ash entrained in the recirculation zone, ash falloff from deposits on the turning vanes, ash deposits on upstream grids or catalyst, and ash fallout from below the structural member.[46]

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[42] Oak Grove Ex. 3A at 296.

[43] Id.

[44] Id. (Emphasis added.)

[45] Mr. Cichanowicz noted that lignite has a "high potential for deposition." (Tr. v. 3 at 470.)

[46] *See* Tr. at 330 - 339 for Mr. Cichanowicz's testimony regarding the ways ash can interfere with the operation of the SCR process. *See also* Oak Grove Ex. 3A at 295-296 for Mr. Cichanowicz's complete description of Oak Grove Ex. 39 (Attachment B).

Likewise, Mr. Cichanowicz's prefiled testimony pointed out the need for a commercial-scale testing. He explained that development of reliable commercial environmental control technology takes significant time and a series of steps. These include laboratory and pilot-scale tests and a full-scale test conducted on a commercially operating power station at a single site, with an initial duration of hours to days.[47] Mr. Cichanowicz also stated that full-scale tests at numerous commercial operating sites should be conducted to "generalize" the applicability of the technology to different configurations, coal types, and operating practices; finally, he asserted that operation of "an evolving technology" for twelve to eighteen months is "an essential step to confirm the ability of a process to operate reliably, on a continuous basis, with operator attention and maintenance practices that are routinely available at a commercial plant."[48]

In this case, there is some evidence of pilot-testing of SCR with lignite at the UND, and of the commercial use of SCR with *PRB subbituminous coal* at the W. A. Parish units near Houston, but there has been no commercial testing or long-term use of SCR with lignite anywhere in the United States. TXU has conducted a series of exploratory in-situ reactor tests to evaluate the performance of several catalyst samples at its Martin Lake Station. However, Mr. Cichanowicz explained that these tests simply explored the chemistry of interactions of the ash inorganic compounds with the catalyst.[49] In addition, TXU plans to install an SCR pilot plant treating a slipstream of exhaust gas from its lignite-fired Sandow Unit No. 4 by September 2006. Mr. Cichanowicz expects ash deposition and fouling to occur in this pilot test, so the SCR will be designed for an outlet value of 0.05 lb/MMBtu NO_x by incorporating additional catalyst volume to achieve an actual outlet value of 0.08 lb/MMBtu NO_x. Mr. Cichanowicz thinks the results of the

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[47] Oak Grove Ex. 35 at 30.

[48] Oak Grove Ex. 35 at 31.

[49] Oak Grove Ex. 3A at 294-95.

pilot test "will be instructive."[50] But this pilot test will only involve a slipstream (a diversion of a portion of the exhaust gas to the SCR) and has not yet occurred.

Mr. Cichanowicz's testimony at hearing also confirmed the uncertainty of whether an SCR will function adequately with lignite. He stated that Texas lignite has both high ash and high calcium that will react with the catalyst and cause deposits. In addition, high levels of silica will erode the catalyst material. Thus, Mr. Cichanowicz stated, even though the "world standard" is to use 1.1 cubic meters of catalyst, he assumed an oversized SCR with 1.4 cubic meters of catalyst for his Oak Grove calculations.[51] However, there is no evidence of testing or other analysis to support the assumption that more catalyst will solve the problem.[52] Indeed, Mr. Cichanowicz testified that different solutions to the ash problem are being attempted industry-wide, yet "sometimes these work and sometimes they don't . . . it's just the time frame and the extent of – the extent that progress can be made. That's, you know, it's a little bit uncertain."[53] Hence, the evidence is clear that adequate commercial testing and development have not occurred to determine at this time whether use of an SCR with lignite will perform as claimed by Oak Grove at the proposed facility.

In addition to the ash in lignite blocking and degrading the SCR, a second problem exists with the use of lignite: the performance of the low-NO_x burners and over-fired air. Mr. Cichanowicz explained that lignite's higher moisture content and lower volatility interfere with the ability of low-NO_x burners and over-fired air to inherently control NO_x within the boiler. In contrast, PRB subbituminous coal has a high volatile fraction and lower moisture that allow the flame to stabilize quickly and support the low-NO_x attributes of the firing system. As a result, subbituminous coal can be controlled with low-NO_x burners and over-fired air to as low as 0.10 lbs/MMBtu NO_x coming out

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[50] Oak Grove Ex. 35 at 24.

[51] Tr. v. 3 at 485.

[52] A catalyst is a substance that initiates a chemical reaction; in this case a chemical reaction to reduce NO_x to nitrogen and water.

[53] Tr. v. 3 at 408.

of the boiler (that is, before entering the SCR). However, Mr. Cichanowicz estimated that Texas Wilcox lignite boiler NO_x rates will range from 0.20 to 0.24 lbs/MMBtu. Consequently, he noted that the degree of NO_x reduction achieved by the SCR to deliver a specific level of outlet NO_x must necessarily be higher with the use of lignite than with PRB coal.[54]

Protestants' expert witness, Richard Furman, a chemical engineer, also testified that Oak Grove's proposed air pollution systems for NO_x have not been demonstrated on a commercial scale with lignite.[55] He reiterated that lignite's low volatility interferes with the capability of low-NO_x burners and over-fired air to control the generation of NO_x in the boilers. Consequently, he stated, higher NO_x levels are produced, yet blockage from the high ash content of lignite makes it more difficult for an SCR to work. In Mr. Furman's view, this produces "the worst of both worlds."[56] Mr. Furman stated that the Oak Grove facility has a high probability of ineffective NO_x control due to the high level of ash blocking the SCR and the high levels of ash, silica, and quartz eroding the catalyst surface.[57] In his opinion, it is "highly unlikely" that Oak Grove will be able to meet the NO_x emission levels it has represented it will meet.[58]

In its closing brief, Oak Grove acknowledges the challenges of using SCR with lignite to control NO_x but argues that it is technically feasible. Oak Grove relies primarily on Mr. Cichanowicz's experience and testimony. Applicant also cites a recent Environmental Protection Agency (EPA) statement in the *Federal Register* that use of SCR with lignite is technically feasible.[59]

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[54] Oak Grove Ex. 35 at 19.

[55] Protestants' Ex. 7A at 5.

[56] Tr. v.5 873.

[57] Tr. v.5 874.

[58] Tr. v.5 878.

[59] Oak Grove Closing Argument at 15-17.

Mr. Cichanowicz stated that a 0.08 lb/MMBtu NO_x emission rate can be met and testified as follows regarding the assumptions and calculations he made to derive that rate:

> . . . I believe the initial NO_x rates generated by the [Station's] boilers will range from 0.20 to 0.24 lbs/MMBtu, with the final value dependent on the details of the boiler design. The range represents the uncertainty to which combustion conditions within the flame zone can be manipulated to minimize conversion of fuel-bound nitrogen to NO_x while maintaining high boiler efficiency. Assuming the midpoint of these values (0.22 lbs/MMBtu) as the design basis, if the SCR NO_x reduction efficiency typical of the W.A. Parish Units (65%) can be attained for the Oak Grove boilers, the initial limit contained in the draft permit of 0.08 lbs/MMBtu can be met. It is possible, but not certain, that if the catalyst can be maintained clean over time, SCR NO_x reduction efficiency can be increased up to as high as 75 to 80% following initial operations.[60]

Mr. Cichanowicz, however, presented no evidence of prior testing or other experience to establish the estimated 65-percent SCR efficiency rate *with lignite*. Instead, Mr. Cichanowicz simply noted that W.A. Parish has about a 65-percent efficiency rate. Yet, the Parish units use *PRB subbituminous coal*. And with no corroboration from commercial-scale testing of SCR with lignite, Mr. Cichanowicz's 65-percent estimate is merely an educated guess.

The ALJs especially note the uncertainty in Mr. Cichanowicz's 2005 memorandum, in which he stated that he could not project whether popcorn or large ash (LPA) will be manageable for lignite SCR applications; that near-complete removal of LPA is required to eliminate it as a concern; that the design of an SCR reactor for lignite-coal firing will address several issues that have never been implemented as a complete system on lignite or any other type of coal; and that a commercial-scale test is required to assure the design specifics and confidences for commercial application of environmental controls. Under this state of the evidentiary record, the ALJs are not persuaded that 65-percent SCR efficiency for lignite is a sufficiently reliable estimate upon which to recommend approval of an air permit.

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[60] Oak Grove Ex. 35 at 21-22.

Oak Grove also cited a statement by the EPA in the *Federal Register* that use of SCR on lignite is "technically feasible." This statement is contained in a response to comments concerning a new proposed NO_x emission limit of 1.0 lb NO_x/MWh gross energy (equivalent to 0.11 lb/MMBtu) for new electric utility steam generating units.[61] Several commentators stated that the new proposed NO_x limit was not feasible for lignite-fired boilers. While EPA thought that SCR pore-plugging and catalyst-binding problems could be addressed during the SCR design phase, it also pointed out that "use of SCR is not required to comply with the amended NO_x standard."

Furthermore, EPA partially relied on this Oak Grove application and the recent Twin Oaks 3 application to conclude that SCR is feasible with lignite. In explaining its response, EPA stated: "In addition, two recent permit applications for pulverized lignite-fired utility units in Texas (Twin Oaks 3 and Oak Grove facilities) propose to use SCR to control NO_x emissions to 0.07 and 0.10 lb/MMBtu respectively." (As noted previously, Oak Grove's NO_x limit has been reduced from 0.10 lb/MMBtu to 0.08 lb/MMBtu.) The ALJs believe it would be circuitous reasoning to conclude that this permit application should be approved because EPA found the use of SCR with lignite "technically feasible," when EPA partially based its feasibility finding on this unapproved permit application. The ALJs also note that the EPA NO_x standard under consideration was the equivalent of 0.11 lb/MMBtu, which is 37 percent higher than the 0.08 lb/MMBtu limit contained in the draft permit. Therefore, the ALJs are not persuaded that EPA's statement that use of SCR with lignite is "technically feasible" establishes that the Units will achieve the required 0.08 lb/MMBtu NO_x limit contained in the draft permit.[62]

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[61] 71 FED. REG. 9868, 9869 (Feb. 27, 2006).

[62] The EPA's full response to these comments stated:

> Response: EPA disagrees that lignite-fired steam-generating units would not be able to achieve the amended NSPS [0.11 lbs/MMBtu]. While there are no existing lignite-fired electric utility steam-generating units with SCR in the United States, there is considerable experience in the industry to show that use of SCR on lignite is technically feasible. EPA has concluded that the primary reason that no pulverized lignite-fired units are equipped with SCR is because no new pulverized lignite unit has been built in the United States since 1986.
>
> The Electric Power Research Institute testing of SCR catalyst in a slipstream at the Martin Lake Power plant showed acceptable results from Gulf

In addition to Mr. Cichanowicz, Oak Grove contends both Mr. Moon and Mr. Hamilton supported the 0.08 lb/MMBtu NO_x emission limit set forth in the draft permit. However, the ALJs note that Mr. Moon did not actually state he supported the NO_x limit. Rather, he testified that, after considerable review of the uncertainties and discussion with TCEQ staff, it was determined that BACT for the lignite-fired Oak Grove Units is installation of an SCR specified to meet 0.05 lb/MMBtu.[63] Likewise, Mr. Hamilton did not literally testify he supported the NO_x limit. Instead, he stated the following:

> . . . there is no SCR experience on lignite-fired boilers at the levels proposed by [Oak Grove] and the nature and quantity of lignite flyash adds risk in achieving SCR performance. These differences justify a higher NO_x limit for [Oak Grove] than CPS

Coast lignite. In addition, two recent permit applications for pulverized lignite-fired utility units in Texas (Twin Oaks 3 and Oak Grove facilities) propose to use SCR to control NOx emissions to 0.07 and 0.10 lb/MMBtu, respectively. Finally, technology suppliers report that SCR has been successfully used on lignite and brown coal boilers in Europe. EPA has concluded that SCR can be used on lignite boilers in the United States and catalyst suppliers have indicated that they will offer performance guarantees on these applications.

Pore plugging and binding of a catalyst is a common problem experienced by pilot test facilities. In full scale installations, this concern is addressed during the SCR design stage. The methods used to avoid this problem include duct design to promote ash fallout prior to the SCR, catalyst reactor design to avoid ash buildup, and on-line cleaning methods (soot blowers and sonic horns).

In addition, the use of SCR is not required to comply with the amended NOx standard. The existing Big Brown facility in Texas burns pulverized Gulf Coast lignite and is able to achieve 0.15 lb NOx/MMBtu with combustion controls alone. EPA has concluded that the new lignite-fired units would either be able to achieve the amended standards without the use of any back-end controls or could use SNCR [selective non-catalytic reduction] to comply. Existing units at 0.15 lb/MMBtu would only need 30 percent NOx reduction to comply with the amended NOx standard. This level of control has been demonstrated for existing pulverized coal (PC) units retrofit with SNCR, and new units could achieve even better results.

Fluidized bed combustion and gasification are also options for new lignite units. The proposed permits for the Westmoreland and South Heart facilities in North Dakota both propose to burn Fort Union lignite in fluidized beds and use SNCR to achieve a NOx emissions limit of 0.09 lb/MMBtu. With regard to size, Foster Wheeler recently designed a 460 MW supercritical fluidized bed.

71 FED. REG. 9870 (Feb. 27, 2006).

[63] Oak Grove Ex. 1 at 74.

and Sandy Creek.[64]

The ALJs find that Oak Grove did not prove by a preponderance of the evidence that its BACT proposal to use SCR with lignite-fired boilers can reasonably be expected to achieve a 0.08 lb/MMBtu NO_x emission rate. The evidence shows that SCR is a relatively new technology that has never been used in the United States on a commercial scale with a lignite-fired electric power plant. Serious problems with ash plugging have occurred with the SCR at the W.A. Parish units near Houston that use PRB coal, and all witnesses agreed that ash plugging and catalyst corrosion will be even worse with lignite. Likewise, all witnesses on this issue agreed that lignite has higher moisture content and lower volatility that will reduce the effectiveness of low-NO_x burners.

As described by Mr. Cichanowicz, commercial-scale testing is necessary to prove the reliability of the control technology proposed by Oak Grove–SCR with lignite-fired boilers–and to determine what NO_x emission levels can be achieved with that technology. Mr. Cichanowicz testified that "significant time and a series of steps" are required to develop reliable commercial environmental control technology.[65] However, Oak Grove is, in effect, requesting that the Commission allow Oak Grove to skip that significant time and series of steps and that the Commission approve Oak Grove's application for what effectively is a full-scale, two-year test of this "evolving technology."

Because the ALJs find that Oak Grove failed to establish by a preponderance of the evidence that its BACT proposal of using SCR with lignite-fired boilers to control NO_x is technically practicable, the ALJs recommend the Commission find that Oak Grove has failed to prove that its proposed NO_x control technology would likely achieve the NO_x emission rate required in the draft permit.

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[64] Oak Grove Ex. 40 at 22.

[65] Oak Grove Ex. 35 at 30-31.

B. Whether Oak Grove proved by a preponderance of the evidence that its BACT proposal of using wet FGD, SCR, fabric filter baghouses, and active carbon injection (ACI) to control mercury (Hg) is technically practicable and would achieve the performance standards specified in the application and draft permit.

The ALJs recommend the Commission find that Oak Grove failed to prove by a preponderance of the evidence that its BACT proposal of using wet FGD, SCR, fabric filter baghouses, and ACI to control mercury is technically practicable and would achieve the performance standard specified in the application and draft permit.

1. Background

Oak Grove is proposing to utilize wet FGD, SCR, fabric-filter baghouses, and ACI to achieve an annual mercury emission rate of 9.2 lb/TrillionBtu (TBtu), which equals approximately 92 x 10^{-6} lb/MWh.[66] Although the FGD, SCR, and baghouses will be installed to remove other air contaminants, they will also remove a portion of the mercury.[67] Oak Grove's proposal to utilize ACI will be the first time an ACI system has been used on Texas lignite-fired units. The ACI system injects powdered treated activated carbon into the exhaust gas ductwork ahead of the fabric-filter baghouse; the carbon then collects on the surface of the fabric-filter bags where oxidized mercury, contained in the flue gas passing through the fabric filters, is absorbed.[68]

The average mercury concentration in lignite is about three times higher than the average mercury concentration in PRB coal.[69] Additionally, removal of mercury from lignite is more difficult

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[66] The 9.2 lb/TBtu rate was equal to EPA's proposed Maximum Available Control Technology Standard (MACT). Eventually, EPA decided not adopt the MACT, but Oak Grove is proposing that rate as BACT for the Station's Units. (Oak Grove Ex. 3E at 52.) The New Source Performance Standards (NSPS) mercury limit for lignite-fired boilers is 175 x 10^{-6} lb/MWh. (Tr. v. 1 at 43-44.)

[67] Oak Grove Ex. 1 at 80.

[68] Oak Grove Ex. 1 at 80-81.

[69] Tr. v. 4 at 582 (Randy Hamilton).

than from PRB coal because it contains a high level of elemental mercury that is difficult to oxidize due to lignite's low chloride content.[70] For these reasons, the mercury emission rate for the Oak Grove facility is 4.5 times greater than the recently permitted Sandy Creek facility that will use PRB coal.[71]

2. Oak Grove's Argument

Oak Grove asserts that, for the following reasons, the evidence establishes the proposed mercury emission limit contained in the draft permit is adequately conservative and achievable.

First, Oak Grove argues the mercury limit is conservative because it does not account for inherent mercury removal – a co-benefit to the suite of controls proposed by Oak Grove. Oak Grove notes that Mr. Cichanowicz testified that the SCR and FGD, which will be used to control NO_x and SO_2 emissions from the Units, will achieve some degree of inherent mercury removal.[72] And, asserts Oak Grove, despite data that suggest mercury emissions from the Units may be reduced by 25 percent or higher in the SCR and FGD, the mercury limit contained in the draft permit can be met even assuming that no amount of inherent mercury removal is achieved.

Second, Oak Grove contends the mercury limit contained is conservative because it reflects a level of control that can be achieved by "plain old vanilla"activated carbon, not the higher levels that Oak Grove will be able to achieve using enhanced activated carbon sorbents. Oak Grove points to Mr. Cichanowicz's testimony on this subject as support for its assertion. Mr. Cichanowicz noted that, while there is sufficient test data to suggest that "general vanilla-flavored activated carbon" can, on its own, "come close" to achieving the mercury reduction efficiencies required by the draft

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[70] Oak Grove Ex. 40 at 21 of 40; Tr. v. 3 at 511-512.

[71] The Station's annual mercury emission rate is 92 x 10^{-6} lb/MWh while Sandy Creek's rate is 20 x 10^{-6} lb/MWh. *See* Order, Application of Sandy Creek Energy Associates, Finding of Fact No. 220, TCEQ Docket No. 2005-0781-AIR (May 25, 2006).

[72] Oak Grove Ex. 35 at 34.

permit, there are "special flavor[s] of activated carbon" that have been "impregnated with a number of chemicals" that "tend to be much more effective than just plain old vanilla" activated carbon.[73] Indeed, Oak Grove argues, Mr. Cichanowicz stated that the Department of Energy has tested six lignite-fired boilers in the United States using different types of enhanced carbon sorbents "with favorable results."[74]

Additionally, Oak Grove contends there will be three coal-fired units starting up in 2007 that will "provide significant commercial experience" with enhanced carbon sorbents prior to the start-up of the Oak Grove Units. As a result, Oak Grove argues, by the time it must specify an exact form of activated carbon for the Units, there will have been sufficient opportunity to resolve any uncertainties regarding sorbent selection and to optimize the enhanced sorbent to be used, thus resulting in greater reduction efficiencies than can be achieved using "plain old vanilla" activated carbon.

Third, Oak Grove asserts that, not only is the mercury limit contained in the draft permit conservative, it also reflects a reduction efficiency similar to that required by the Sandy Creek permit, which also specifies ACI for mercury control. Oak Grove points out that Mr. Cichanowicz performed a comparison of the required mercury removal efficiencies for the Station's Units and the Sandy Creek facility and concluded that the removal efficiencies required for the Station's Units are only slightly lower than those required for the Sandy Creek facility and are consistent with the results of pilot-scale testing performed on 100-percent lignite and blends of lignite with PRB coal.[75] In other words, argues Oak Grove, taking into account the different mercury content of the PRB coal to be burned in the Sandy Creek facility and the lignite to be burned in the Station's Units, the mercury emission limits established for both plants reflect relatively similar mercury removal efficiencies.

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[73] Tr. v. 3 at 473.

[74] Tr. v. 3 at 476.

[75] Oak Grove Ex. 35 at 35-36.

Oak Grove asserts that Mr. Cichanowicz considered these factors in light of the challenges and uncertainties related to mercury control and concluded that an emission limit of 9.2 lb/TBtu is technically feasible for the Units. Applicant further notes that Mr. Cichanowicz determined that, along with SCR and FGD, the use of ACI to achieve this emission limit represents the lowest technically practicable mercury removal level for lignite.[76]

Applicant also contends that Mr. Moon and Mr. Hamilton support the mercury emission limit contained in the draft permit. Thus, Oak Grove asserts that the mercury emission limit established in the draft permit is representative of BACT.

3. ED's Argument

The ED argues that Mr. Hamilton concluded that Oak Grove's proposed emission limitation for mercury is BACT and that its chosen control technology is capable of meeting this limit.[77] The ED notes that Mr. Hamilton used the Tier III analysis for mercury, including evaluating the technical feasibility and economic reasonableness of more stringent mercury emissions limitations than those contained in the draft permit.[78] In addition to this analysis, Mr. Hamilton testified that, because mercury control technology is undergoing rapid development, BACT for mercury is not firmly established.[79]

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[76] Oak Grove Ex. 35 at 36; Tr. v. 3 at 502.

[77] Oak Grove Ex. 40 at 13 of 40. *See also* Oak Grove Ex. 40 at 27 of 40. As stated in the draft permit, the emission limit is 0.0000092 lb/MMBtu.

[78] Oak Grove Ex. 40 at 16 of 40.

[79] *Id. See also* additional testimony regarding the mercury BACT analysis conducted by Mr. Hamilton in Oak Grove Ex. 40 at 27 of 40.

4. Protestant's Argument

Protestant argues that the high mercury emission rate for the Units results from Oak Grove's selection of 100-percent lignite as fuel. In Protestant's opinion, BACT analysis should include consideration of cleaner forms of fuel. Without such a BACT fuel consideration, Protestant complains that an applicant can choose a fuel's mercury (and nitrogen) content based solely on economic grounds. Protestant asserts that, since Oak Grove and the ED failed to review Oak Grove's fuel choice as part of the BACT evaluation, the BACT review is incomplete and Oak Grove's application for a permit should be denied.

5. PIC's Argument

The PIC points out that Oak Grove initially proposed a higher mercury emission rate than is currently proposed.[80] The PIC also notes that, even after Mr. Hamilton recommended a lower mercury emission rate, the mercury emission limits found in Oak Grove's draft permit are much higher than those most recently approved for Sandy Creek's facility. However, the PIC acknowledges that Oak Grove's facility would be the first to use ACI as a control device for mercury in lignite-fired pulverized coal boilers. Thus, the PIC states that, with such a limited amount of historical data for removal efficiencies of mercury from lignite using ACI, the proposed mercury limit may indeed reflect the best estimate at achievable limits for a facility that chooses to burn lignite.

The PIC also argues that the problem is Oak Grove's selection of lignite as fuel. The PIC asserts that neither the ED nor Oak Grove has cited any authority for refusing to consider the selected fuel source as part of the BACT analysis. While the PIC acknowledges the economic value of using Texas lignite, the PIC questions whether it is "truly BACT for a brand new source to have the

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[80] *See* Oak Grove Ex. 6 at 31.

potential to emit pollutants such as mercury at rates 4 times as high as recently proposed for another PC boiler."[81]

6. Analysis

Mr. Hamilton testified that "mercury control with lignite is considered the most difficult of the coal types. The low chloride content of lignite coal compared to eastern bituminous favors the formation and emission of elemental [non-oxidized] mercury, which is poorly removed by most existing controls."[82] He further stated, "The control technology is still in the phase of rapid improvement, with many short-term control technology demonstration projects accomplished and on-going, and little permanent installation of add-on controls yet."[83]

In establishing the proposed mercury emission limit, Oak Grove assumed that the efficiency of its suite of emission controls would be less than the Sandy Creek facility due to Oak Grove's use of lignite. Mr. Cichanowicz testified that the Sandy Creek facility must achieve a mercury reduction efficiency of approximately 80 percent to meet its 2 lb/TBtu permit limit, whereas the Oak Grove facility must attain a mercury reduction efficiency of 68 to 72 percent (depending on which lignite deposit is used) to achieve its higher 9.2 lb/TBtu mercury emission limit.[84] The lower mercury-removal efficiency for the Oak Grove facility is due to the greater difficulty of removing mercury from lignite compared to PRB coal.

Oak Grove contends the mercury emission limit of 9.2 lb/TBtu is technically feasible and that, along with SCR and FGD, the use of ACI to achieve this emission limit represents the lowest

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[81] PIC's Closing Argument at 6-7.

[82] Oak Grove Ex. 40 at 21 of 40.

[83] Oak Grove Ex. 40 at 27 of 40.

[84] Oak Grove Ex. 35 at 35.

technically practicable mercury removal level for lignite.[85] However, the ALJs find that Oak Grove failed to establish by a preponderance of the evidence that its proposed suite of mercury controls would achieve the 9.2 lb/TBtu mercury emission limit required by the draft permit.

As discussed previously, the process for determining the technical practicability of a BACT proposal involves resolving such questions as: "Has the proposal been demonstrated to work based on actual operation?" Again, the ALJs find the answer to that question is "No." Oak Grove's BACT proposal to use ACI with 100-percent lignite to control mercury emissions has not been shown to work based on actual operation.

No commercial demonstrations of ACI have been conducted with Texas lignite and the fabric-filter environment proposed for the Oak Grove facility. Mr. Cichanowicz testified that demonstrations of ACI have been conducted on numerous equipment configurations, but none used the Texas lignite and fabric-filter environment proposed by Oak Grove. He explained that the demonstration that most closely simulated the Station's proposed configuration was a 21-day trial at the W. E. Energies Pleasant Prairie Plant Power Plant (W. E. Energies). However, that demonstration used PRB coal, not lignite. Mr. Cichanowicz further noted that other demonstrations have been carried out exposing lignite-derived flue gas to ACI, but those were carried out in conjunction with "dry" FGD, which alters the process conditions affecting mercury removal.[86] Mr. Moon also acknowledged that the suite of controls that Oak Grove proposed for mercury has not been used on a commercial scale.[87]

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[85] Oak Grove Closing Brief at 22-23.

[86] Oak Grove Ex. 35 at 28.

[87] Tr. v. 1 at 55.

Addressing the second question: can Applicant's BACT proposal to control mercury emissions with ACI and fabric filters reasonably be expected to work based on technical analysis? The ALJs find that Oak Grove failed to show by a preponderance of the evidence that its proposal can reasonably be expected to work.

Mr. Cichanowicz testified that, with a properly designed carbon-based sorbent injection system, he believed the Units could achieve 68 to72-percent mercury removal efficiency (depending on which of the Texas Wilcox lignite average mercury content numbers is used) in order to meet the emissions limit.[88] Yet, Applicant provided no evidence demonstrating that a 68 to72-percent mercury removal efficiency in a commercial facility can be achieved at this time with 100-percent lignite fuel.

Mr. Cichanowicz testified that tests on Texas lignite at TXU's Big Brown facility showed only 15 to 26-percent mercury capture across a fabric-filter type environment (without ACI).[89] The W. E. Energies demonstration, using ACI with PRB coal, showed mercury removal was limited to 55 to 60 percent (including inherent mercury removal).[90] Further, pilot tests with ACI performed for TXU at the University of North Dakota showed that Texas lignite had "a dominant effect on mercury capture" and that, in general, 100-percent Texas lignite fuel had 15 to 30 percent less mercury removal than a 70/30 percent blend of lignite and PRB.[91] Thus, a mercury capture of significantly less than the 55 to 60 percent achieved by W. E. Energies with PRB coal would be expected with 100-percent lignite, even with ACI and fabric-filter baghouses. This is confirmed by Oak Grove's responses to requests for information from the ED, which stated:

> The results of pilot testing [by the University of North Dakota for TXU] confirm earlier review by EPA that showed carbon injection is not as effective on lignite as on other coals. *During the pilot testing, the maximum removal efficiency achieved*

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[88] Tr. v. 3 at 506; Oak Grove Ex. 35 at 36.

[89] Oak Grove Ex. 35 at 27.

[90] Oak Grove Ex. 35 at 28.

[91] Oak Grove Ex. 3B at 112.

> *using treated carbon on a 100% lignite sample was only 55% removal.* Tests on other fuels and blends did much better. One of the conclusions of the report was "in general, 15 to 30% decreases in mercury capture were realized during 100% lignite tests." *These findings confirm additional research and testing is needed to demonstrate the potential for this technology.*
>
> * * *
>
> *While the treated carbon injection is a promising technology, the control level that can be achieved with Texas lignite is highly questionable and has not been demonstrated on any full-scale basis or actual unit.* This technology also has a detrimental side effect of contaminating ash so that it can no longer be used as a concrete additive.
>
> * * *
>
> During the mercury rulemaking process, TXU conducted a survey of potential vendors of mercury control systems. *None of the vendors would guarantee any emission rate for lignite without additional studies. . . .*[92]

Oak Grove provided those responses to the ED's requests for information on November 17, 2005, and it offered no evidence of more recent developments that would change these conclusions. This evidence makes clear that the *maximum* mercury removal efficiency in a pilot demonstration for lignite using ACI was only 55 percent, well below the 68 to 72-percent efficiency that the Oak Grove facility needs to achieve its mercury emission limit. Further, even the 55-percent removal efficiency for lignite was only a short-term, pilot-scale test, and no full-scale demonstration has been performed on an actual unit.

With these facts, Mr. Cichanowicz nevertheless predicted that Oak Grove could meet its mercury-emissions limit based on new sorbent technology that may be developed before Oak Grove would begin operation as proposed in 2009.[93] Some proprietary sorbents under development have tested as high as 80 to 90-percent mercury removal on other coals, and Mr. Cichanowicz believes improvements in these sorbents will *in the future* provide the required 68 to72-percent mercury

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[92] Oak Grove Ex. 3B at 7. (Emphasis added.) Oak Grove originally proposed a mercury emission limit of 14.5 lb/TBtu, without the use of ACI, which was then the original EPA rulemaking NSPS limit (later revised upward). Oak Grove Ex. 3B at 6. These comments were in response to TCEQ staff's request that Oak Grove explain its 14.5 lb/TBtu proposed limit.

[93] Tr. v. 3 at 476.

removal efficiency for the Oak Grove facility. However, he acknowledged that the "enhanced" sorbents under development have never been tested on Texas lignite and "there does need to be additional work done."[94]

In its closing argument, Oak Grove reiterated Mr. Cichanowicz' testimony that enhanced activated carbon sorbents will be developed that will enable the Oak Grove facility to achieve the required mercury emission limit when it begins operations, and Oak Grove noted that three coal-fired units will begin operation in 2007 that will provide significant commercial experience with enhanced carbon sorbents. However, Oak Grove failed to mention that two of those plants will use PRB coal and the third will use low-sulfur Colorado coal; none will use lignite.[95]

Additionally, Oak Grove repeated Mr. Cichanowicz's statement that the Department of Energy has tested six lignite-fired boilers in the United States using different types of enhanced carbon sorbents. Oak Grove argued that those tests showed "favorable results." However, the ALJs note that Mr. Cichanowicz actually testified that only "a couple of [the tests]," using mostly northern lignite, showed "pretty good results."[96] The ALJs further observe that Mr. Cichanowicz testified that "general vanilla-flavored activated carbon" can, on its own, only "get pretty close" to meeting the percent removal of mercury required by the draft permit.[97]

Contrary to Applicant's argument that the SCR and FGD will provide a co-benefit, Mr. Hamilton questioned whether the ACI control system would receive much co-benefit from the SCR. He testified that no such data exist for Texas lignite.[98] Although Mr. Cichanowicz suggested that the use of SCR at the Oak Grove facility might help oxidize the elemental mercury to aid in

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[94] Tr. v. 3 at 505.

[95] Tr. v. 3 at 501.

[96] Tr. v. 3 at 476.

[97] Tr. v. 3 at 473.

[98] Tr. v. 4 at 707-708.

possible mercury removal by the FGD unit, he acknowledged that "*the supporting data is sparse and suggests highly variable behavior; thus the actual result is uncertain.*"[99] Because "the actual result is uncertain," Mr. Cichanowicz pointed out that Oak Grove is assuming that only ACI and the fabric filter will control mercury.[100]

Mr. Hamilton noted that if Oak Grove's PC boilers are unable to comply within 180 days of initial startup with the performance standards identified in the permit for the control of mercury (and for NO_x and ammonia) then, pursuant to Special Condition 49 of the draft permit, Oak Grove can request additional time to try to "adjust the system" to mitigate emissions.[101] He further acknowledged that the capabilities of conventional carbon "appeared to be about there" in terms of meeting the percent removal of mercury required by the draft permit, which is "probably a little different from 'no problem.'"[102]

Protestant's expert, Mr. Furman, testified that he did not believe that technology will be developed to enable the Oak Grove facility to achieve its mercury emission limit when it begins operation. He stated that activated carbon is still being tested on higher ranked coals and has little success in controlling mercury in low ranked coals, such as lignite. Mr. Furman also stressed that Texas lignite has a high level of elemental mercury (non-oxidized mercury) that is very difficult to remove. In his view, it is doubtful that effective mercury control technology for Texas lignite will be developed before the Station begins operation, as suggested by Oak Grove. Finally, Mr. Furman stated that, in other industries, mercury is removed by pushing the gas stream through an activated carbon bed, but this is too expensive for use in electric generation due to the enormous volume of flue gas.[103]

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[99] Oak Grove Ex. 35 at 27. (Emphasis added.)

[100] Tr. v. 3 at 497-498.

[101] Tr. v. 4 at 712.

[102] Tr. v. 5 at 714.

[103] Tr. v. 5 at 858-862.

As previously discussed under the NO_x issue, BACT requires a consideration of whether the technology has been successfully demonstrated in a commercial setting. There has been no such demonstration of Oak Grove's proposal to use ACI and fabric filters *with lignite* to control mercury. Nor is it clear what mercury emission rate the Oak Grove facility might be able to achieve. All parties agree that lignite presents unique problems for controlling mercury due to lignite's high content of elemental mercury and low content of chlorides necessary for mercury oxidation. Although pilot-scale testing showed that ACI with lignite has a maximum mercury removal efficiency of 55 percent, Oak Grove needs a mercury removal efficiency of 68 to 72 percent to achieve the mercury emission limit in the draft permit.

In short, the evidence established that no demonstration has been made with lignite–on a commercial scale, pilot scale, or otherwise–that ACI with fabric filters can achieve the 68 to 72-percent mercury removal efficiency required for the Oak Grove facility. As a result, Oak Grove is left to argue that its facility can achieve the required removal efficiency and emission limit with enhanced carbon sorbent that may be developed in the future. However, the hope or speculation that an effective ACI technology will be developed for use on a commercial scale before the Station begins operations does not satisfy Oak Grove's burden of proof. Because Oak Grove failed to prove its mercury control technology is technically feasible, the ALJs recommend the Commission find that Oak Grove failed to demonstrate by the preponderance of the evidence that its proposed suite of mercury controls would likely achieve the 9.2 lb/TBtu mercury emission limit required by the draft permit.

VII. OTHER ISSUES

A. Whether Oak Grove's proposed source will cause or contribute to a condition of air pollution.

The ALJs recommend the Commission find that Oak Grove has failed to prove that its proposed source will not cause or contribute to a condition of air pollution.

Pursuant to Health & Safety Code § 382.0518(b) and 30 TAC § 116.111(a)(2)(A)(I), Oak Grove is required to demonstrate that the Station's emissions will not contravene the intent of the Texas Clean Air Act, including protection of public health and property.[104] Additionally, 30 TAC § 101.4 entitled "Nuisance" provides that, "No person shall discharge, from any source whatsoever one or more air contaminants thereof, in such concentration and of such duration as are or may tend to be injurious to or adversely affect human health or welfare, animal life, vegetation, or property, or as to interfere with the normal use and enjoyment of animal life, vegetation, or property." The showings required by the Clean Air Act and these Commission rules are equivalent to a demonstration that no condition of air pollution will occur.[105]

Keith Zimmermann, an engineer and member of TCEQ's Emissions Banking Modeling Team, testified that NAAQS are levels of air quality to protect the public health and welfare and apply to six criteria pollutants: sulfur dioxide, PM, nitrogen dioxide, carbon monoxide, ozone, and lead. He also explained that PSD increments are levels of air quality for certain pollutants designed to prevent a significant deterioration of air quality beyond a level prescribed in 40 CFR §§ 51.166 and 52.21. The Station is subject to a PSD review for NO_x because its potential NO_x emissions [estimated at 7,590 tons per year (tpy) under the draft permit emissions rate] exceed the PSD significance level (40 tpy) defined in 40 C.F.R 52.21(b)(23).[106] Mr. Zimmermann further pointed out that TCEQ's effects screening levels (ESLs) are guidelines for providing "a high degree of certainty of protectiveness of the public health and welfare for non-criteria pollutants."[107]

In addition, effective February 27, 2006, EPA adopted a revised New Source Performance Standard (NSPS) for NO_x emissions from new electric utility steam generating units firing lignite

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[104] Oak Grove Ex. 19 at 12.

[105] *Id.*

[106] Oak Grove Ex. 3E at 8 of 168.

[107] Oak Grove Ex. 41 at 11-12.

of 1.0 lb/MWh output, which equals 0.11 lb/MMBtu heat input.[108] Because the ALJs have concluded that Oak Grove failed to prove that use of SCR with lignite-fired boilers is technically practicable and would likely achieve the performance standards contained in the draft permit, the ALJs also find that Oak Grove has failed to establish by a preponderance of the evidence that the Station will meet the NSPS limit of 0.11 lb/MMBtu for NO_x.

As discussed previously, the primary problem with Oak Grove's NO_x emission projection is the uncertainty and lack of a commercial demonstration that an SCR reactor will adequately reduce NO_x from lignite exhaust, due to lignite flue gas degrading the catalyst and producing excessive ash deposition that will block the reactor channels. Mr. Cichanowicz testified that, with the use of low-NO_x burners and over-fired air, the Units should have a 0.20 to 0.24 lb/MMBtu boiler emission rate before entering the SCR.[109] Because the Station's midpoint boiler emission rate of 0.22 lb/MMBtu is double the current NSPS standard for NO_x emissions, and because the SCR reactor, the only post-combustion NO_x control, has not been shown to be effective with lignite due to ash deposition blockage and catalyst degradation, the ALJs find that Oak Grove has failed to establish by a preponderance of the evidence that the Units will comply with the 0.11 lb/MMBtu NSPS standard for NO_x.

David Castro, Oak Grove's expert witness, testified that he conducted atmospheric dispersion modeling and prepared air quality impacts analyses to show that the emissions from the Oak Grove facility will comply with the NAAQS and PSD increments and to demonstrate that, as compared to the ESLs, the facility's maximum expected off-property concentrations of non-criteria pollutants are acceptable.[110] Among the trace metallic constituents he modeled for comparison with the ESLs was mercury.[111] Mr. Castro emphasized that "the very basis of the [Station's] source information

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[108] 40 C.F.R. § 60.44Da.

[109] Oak Grove Ex. 35 at 19.

[110] Oak Grove Ex. 19 at 12-13.

[111] Oak Grove Ex. 19 at 30.

examined in the modeling" were the emissions calculations and BACT analysis provided by Mr. Hamilton.[112]

However, Oak Grove failed to prove by a preponderance of the evidence that its proposed NO_x and mercury control technologies would likely achieve the required emission rates. In other words, Oak Grove performed its air dispersion modeling based on emission rates that the ALJs have found were not established by a preponderance of the evidence. Therefore, the ALJs find that Oak Grove failed to establish that its modeling reflected the actual emissions of NOx and mercury that will result from the Station.

For these reasons, the ALJs find that Oak Grove failed to prove by a preponderance of the evidence that the Station would comply with the NAAQS and the PSD increments. For these same reasons, the ALJs further find that Oak Grove failed to establish by a preponderance of the evidence that, as compared to the ESLs, the Station's maximum expected off-property concentrations of the non-criteria pollutant of mercury is acceptable.

Because Oak Grove failed to establish by a preponderance of the evidence that (a) the Station would comply with the NAAQS and the PSD increments; (b) as compared to the ESLs, the Station's maximum expected off-property concentrations of the non-criteria pollutant of mercury is acceptable; and (c) the Units will comply with the 0.11 lb/MMBtu NSPS standard for NO_x, the ALJs recommend the Commission find that Oak Grove has failed to prove by a preponderance of the evidence that its proposed source will not cause or contribute to a condition of air pollution.

B. Assessment of reporting and transcription costs.

By Order No. 1, the ALJs required a transcript be prepared in this case because the hearing was scheduled to last longer than one day and the case was proceeding under the expedited schedule

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[112] Oak Grove Ex. 19 at 32.

of the Governor's Executive Order RP49. *See* 30 TAC § 80.23 (b)(4). The transcription costs totaled $17,393.25. Protestant requests that the Commission assess Applicant all transcript costs; Applicant argues that the costs should be shared equally between Applicant and Protestant. The ALJs recommend that the Commission assess all reporting and transcription costs against Applicant Oak Grove.

The Commission's rules at 30 TAC § 80.23(d) list the factors that the Commission shall consider in assessing reporting and transcription costs. The factors relevant to this case include the following:

(A) "The party who requested the transcript." The ALJs ordered the transcript.

(B) "The financial ability of the party to pay costs." Protestant is a small non-profit organization created as a result of Applicant's permit request at issue in this case. Protestant has very limited financial resources. Oak Grove is a wholly-owned subsidiary of TXU Energy Company, which itself is a subsidiary of TXU Corporation, a multi-billion-dollar for-profit corporate entity. Applicant clearly has the greater financial ability to pay costs.

(C) "The extent to which the party participated in the hearing." Oak Grove states that Protestant's cross examination of its and the ED's witnesses consumed the majority of the hearing on the merits. Protestant notes that this is the first permit application for a lignite-fired electric generating plant in many years, and the expedited schedule under Executive Order RP49 reduced the amount of discovery and resulted in the ED not issuing his response to public comment until after the hearing concluded. According to Protestant, these circumstances resulted in more cross-examination of Oak Grove's and the ED's witnesses than otherwise might have been necessary. The ALJs find that the questioning of witnesses by all of the attorneys was generally to the point and directed towards relevant issues. Considering that Oak Grove and the

ED had the overwhelming majority of witnesses to be cross-examined (Oak Grove had seven witnesses; the ED had three witnesses; Protestant had only three witnesses[113]), it is not surprising that Protestant's cross-examination comprised the majority of the transcript. Therefore, the ALJs find that the extent of participation by all the parties was appropriate and that none of the parties unduly burdened the transcript with frivolous arguments or unnecessary questioning of witnesses.

(D) "The relative benefits to the various parties of having a transcript." As the party bearing the burden of proof, Oak Grove could anticipate the greatest potential benefit from an ability to cite and reassemble the information within the record, although all parties benefitted from having a transcript.

(E) "The budgetary constraints of a state or federal administrative agency participating in the proceeding." The broad responsibilities and limited budgets of the agency parties in this case make it unreasonable to assess costs against them. The rules also preclude the Commission from assessing costs against parties that cannot appeal a Commission decision (the ED and the PIC). 30 TAC § 80.23(d)(2).

(F) This factor is inapplicable.

(G) "Any other factor which is relevant to a just and reasonable assessment of costs." The ALJs do not find that any other factor should affect the assessment of transcription costs. The ALJs find that all parties had plausible, good-faith arguments for the issues they raised.

Considering all of the factors set out in the Commission's rules, the ALJs find that Oak Grove's financial ability and potential benefit from having a transcript weigh in favor of assessing

[113] Protestant had a fourth witness, Paul Rolke, who is simply a landowner in the area and was not cross-examined by either the ED or Oak Grove.

all transcription costs against Oak Grove. Therefore, the ALJs recommend that the Commission allocate all reporting and transcription costs to Oak Grove.

VIII. CONCLUSION

After reviewing the record and for the reasons discussed above, the ALJs recommend that the Commission deny the application of Oak Grove Management Company, LLC, for Air Quality Permit No. 76474 and PSD Air Quality Permit No. PSD-TX-1056.

SIGNED August 23, 2006.

Carol Wood

CAROL WOOD
ADMINISTRATIVE LAW JUDGE
STATE OFFICE OF ADMINISTRATIVE HEARINGS

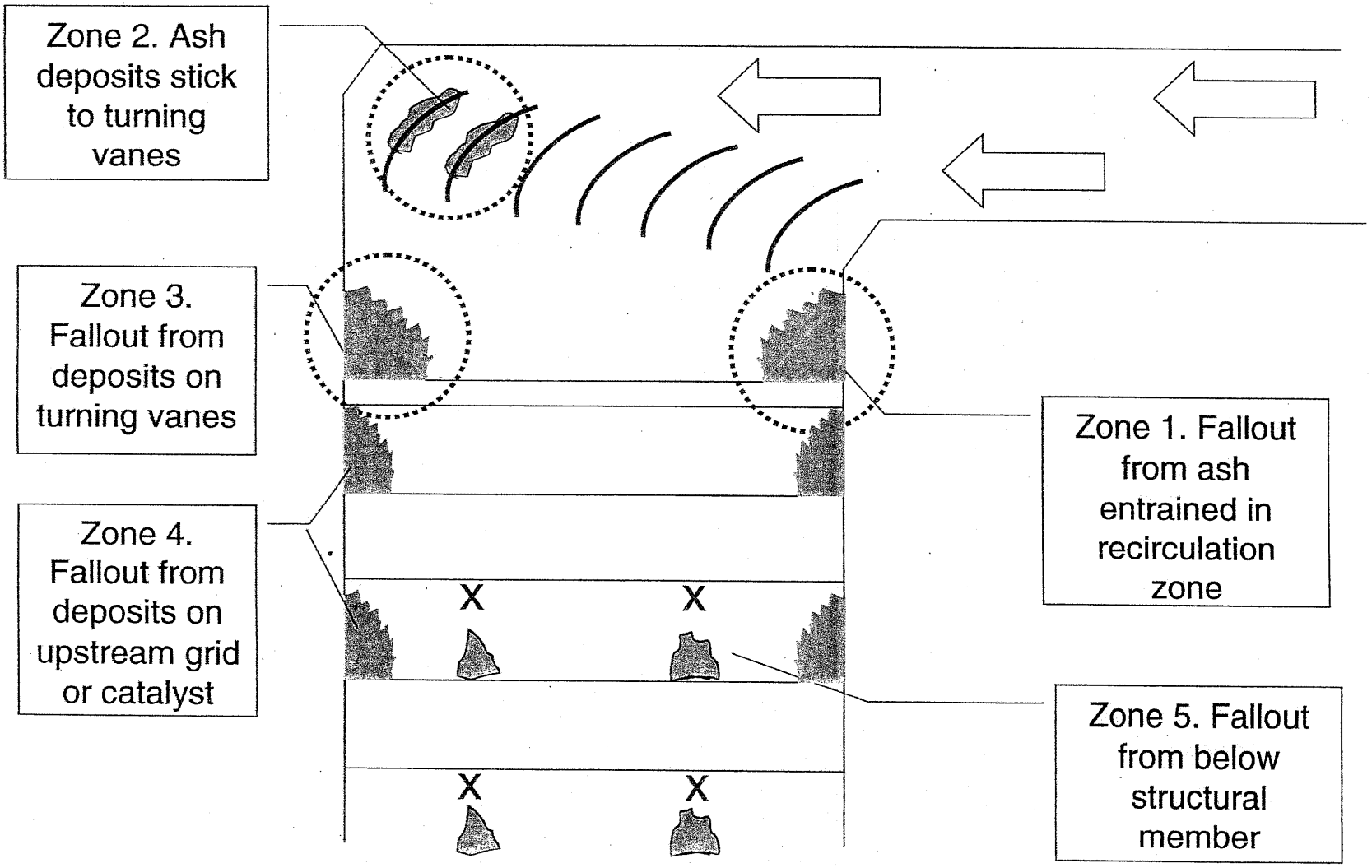
Thomas H Walston

THOMAS H. WALSTON
ADMINISTRATIVE LAW JUDGE
STATE OFFICE OF ADMINISTRATIVE HEARINGS

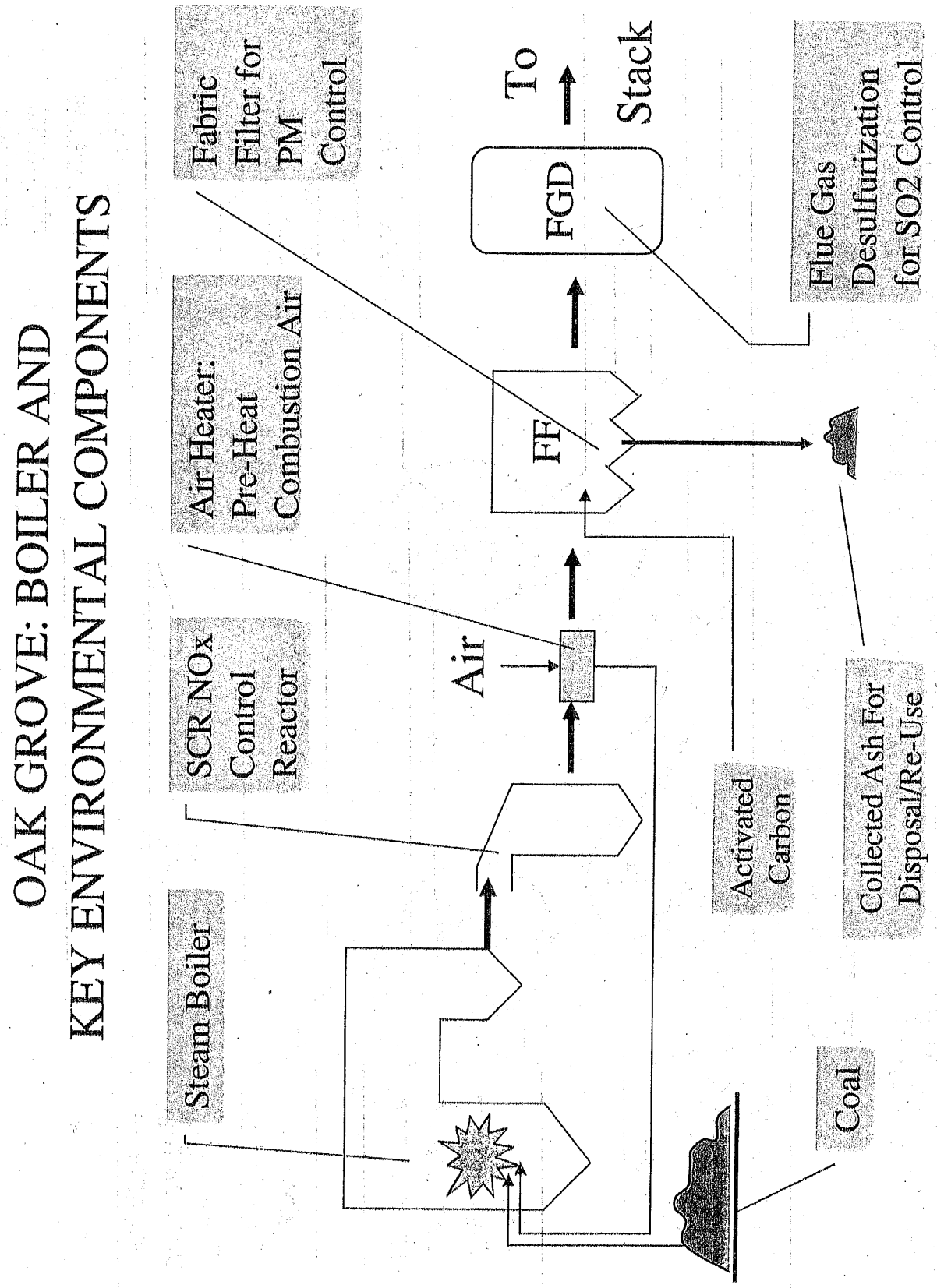
TABLE OF ACRONYMS AND ABBREVIATIONS

ACI	activated carbon injection
BACT	best available control technology
CO	carbon monoxide
FGD	wet flue gas desulfurization
H_2SO_4	sulfuric acid
HCl	hydrogen chloride
HF	hydrogen fluoride
Hg	mercury
LPA	large "popcorn ash"
MMBtu	million British thermal units (Btu)
MW	megawatt
MWh	megawatt hour
NAAQS	National Ambient Air Quality Standards
NH_3	ammonia
NOx	nitrogen oxides
NSPS	New Source Performance Standard
PC	pulverized coal
PM	particulate matter
PM_{10}	particulate matter smaller than 10 microns
PRB	Powder River Basin coal
PSD	Prevention of Significant Deterioration
SCR	selective catalytic reduction
SO_2	sulfur dioxide
TBtu	trillion BTU
UND	University of North Dakota
VOC	volatile organic compound

ANTICIPATED LIGNITE DEPOSITION: 5 ZONES OF CONCERN



ATTACHMENT B


OAK GROVE: BOILER AND
KEY ENVIRONMENTAL COMPONENTS
Steam Boiler
SCR NOx
Control
Reactor
Air Heater:
Pre-Heat
Combustion Air
Fabric
Filter for
PM
Control
Air
FF
FGD
To
Stack
Flue Gas
Desulfurization
for SO2 Control
Activated
Carbon
Collected Ash For
Disposal/Re-Use
Coal

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

AN ORDER denying the application of Oak Grove, Management Co., LLC for Proposed Air Permit No. 76474 and PSD-TX-1056 Docket No. 2006-0195-AIR; SOAH Docket No. 582-06-1502

On _____, 2006, the Texas Commission on Environmental Quality (Commission or TCEQ) considered the application of Oak Grove Management Co., LLC, (Applicant or Oak Grove) for Air Permit Nos. 76474 and PSD-TX-1056. The application was presented to the Commission with a proposal for decision by the Honorable Carol Wood and Tom Walston, Administrative Law Judges (ALJs) with the State Office of Administrative Hearings (SOAH).

After considering the ALJs' proposal for decision and the evidence and arguments presented, the Commission makes the following Findings of Fact and Conclusions of Law:

I. FINDINGS OF FACT

General Facts and Procedural History

1. The proposed Oak Grove Steam Electric Station (the Station) would be a new lignite-fired electricity generating station constructed on a site located off of FM 979 in Robertson County, approximately twelve miles east of Bremond and twelve miles north of Franklin, Texas.

2. The Station would consist of two new lignite-fired boilers, Units 1 and 2, and associated support equipment, including: facilities for receipt, handling, preparation, transport, and storage of lignite; facilities for receipt, handling, and storage of limestone; facilities for

receipt, handling, and storage of anhydrous ammonia; facilities for process products and for waste handling and storage; two 260.5 million British thermal units per hour (MMBtu/hr) oil-fired auxiliary boilers; diesel fuel storage tanks; a 1,444 horsepower (hp) diesel engine emergency generator with a small wet cooling tower; and a 350 hp diesel engine emergency fire pump.

3. Each Unit of the proposed Station would be capable of producing approximately 860 gross megawatts (MW) of electricity, with a maximum heat input of 8,970 MMBtu/hr. The fuel that would be fired in the two boilers would be Texas lignite.

4. Oak Grove Management Company, LLC (Oak Grove), is a wholly-owned subsidiary of TXU Energy Company, LLC, which itself is a subsidiary of TXU Corporation.

5. Oak Grove originally submitted its application for an air quality permit to TCEQ on July 27, 2005. On December 16, 2005, and February 17, 2006, Oak Grove submitted revised pages to the initial application, reflecting changes that had occurred during the technical review phase.

6. Oak Grove posted public notice signs along the perimeter of the proposed site, declaring the filing of its air permit application and stating the manner in which TCEQ could be contacted for further information.

7. Oak Grove published "Notice of Receipt of Application and Intent to Obtain Air Permit" in the *Franklin News Weekly* on August 11, 2005, and in *The Bremond Press* on August 12, 2005.

8. Oak Grove published "Notice of Application and Preliminary Decision for Air Quality Permit" in the *Franklin News Weekly* on February 23, 2006, and in *The Bremond Press* on February 24, 2006.

9. Oak Grove's application was made available for public inspection during the entire public notice period.

10. Oak Grove provided notification of its application to all agencies, regulatory bodies, and other entities to which notification is required.

11. At the request of Oak Grove, the Commission's Chief Clerk directly referred Oak Grove's application to SOAH for a hearing on whether the application complies with all applicable statutory and regulatory requirements. The referral was subject to the procedural requirements of the Governor's Executive Order No. RP49.

12. Oak Grove published notice of the preliminary hearing at the Pridgeon Community Center in Franklin, Texas, in the *Franklin News Weekly* on March 2, 2006, and in *The Bremond Press* on March 3, 2006.

13. At the preliminary hearing conducted on April 3, 2006, in Franklin, Texas, ALJs Thomas Walston and Carol Wood accepted jurisdiction over TCEQ's referral of Oak Grove's application and designated the following as parties: Oak Grove Management Company, LLC; the Commission's Public Interest Counsel; the Commission's Executive Director (ED); and Robertson County: Our Land, Our Lives.

14. ALJs Walston and Wood conducted the hearing on the merits at SOAH's offices in Austin, Texas, from June 13 to June 16 and June 19 to June 20, 2006.

Completeness of Application

15. Oak Grove applied to the Commission for an air quality permit that would also satisfy the federal Prevention of Significant Deterioration (PSD) permitting requirements.

16. Oak Grove submitted a complete Form PI-1 General Application signed by Richard Wistrand, an authorized representative of Oak Grove. Oak Grove's application was also signed and sealed by Larry Moon, a Texas registered professional engineer.

17. Oak Grove remitted a permit fee of $75,000 with its application.

18. Oak Grove provided all supplemental information required by TCEQ's PI-1 Form.

19. Oak Grove's permit application addressed all sources of air emissions from the proposed Station that are subject to permitting under TCEQ rules.

20. The ED's staff reviewed Oak Grove's application to determine whether it complied with all applicable rules and policies and documented the conclusions of that review in an internal report entitled "Construction Permit Review Analysis & Technical Review."

Best Available Control Technology: 30 Tex. Admin. Code § 116.111(a)(2)(C)

NO_x

21. For the lignite-fired boilers, Oak Grove proposes to use low-NO_x burners, over-fired air, and selective catalytic reduction (SCR) to control emissions of NO_x.

22. Special Condition 50 of the draft permit sets out the NO_x optimization terms for the Station's Units: for the first two years of operation, the lignite-fired Units would be subject to a NO_x limit of 0.08 lb/MMBtu while Oak Grove optimizes the SCR. At the end of the two-year operating period, Oak Grove must request to lower the permit limit if a lower rate is justified based on the performance of the SCR with typical and expected maintenance and operational effects.

23. SCR involves injecting ammonia into boiler flue gas in the presence of a catalyst to reduce NO_x to nitrogen (N_2) and water. Catalyst is a dry chemical substance coating the surface of a series of three honeycomb-style metal grates, through which the NO_x and ammonia must simultaneously pass and contact the catalyst for the NO_x reduction chemical reaction to occur.

24. No commercial unit exists in the United States that uses SCR with lignite as Oak Grove proposes.

25. Use of lignite with low-NO_x burners and SCR would be challenging and uncertain because lignite is a low grade coal, having higher levels of ash, silica, and moisture and lower heating value than Powder River Basin (PRB) subbituminous coal.

26. Although TXU has nine lignite-fired plants operating in Texas, eight of those plants co-fire PRB coal with lignite; none is currently equipped with SCR.

27. The most serious problem in using lignite with an SCR reactor is that high levels of ash in lignite would clog and degrade the SCR reactor (the honeycomb-style grates). In addition, high levels of silica would erode and degrade the catalyst material on the surface of the SCR reactor.

28. Another problem with using lignite as a fuel would be reduced performance of the low-NO_x burners and over-fired air in the boilers because lignite has a higher moisture content and lower volatility than PRB coal.

29. Testing of SCRs by the University of North Dakota using subbituminous and lignite coals showed significant accumulation of ash on the catalyst on both macroscopic and microscopic levels.

a. On a macroscopic level, significant observable accumulations plugged the entrance as well as the exit of catalyst sections.

b. On a microscopic level, ash materials filled pores in the catalyst and, in many cases, completely masked the pores within four months of operation.

c. Pressure drop across the catalyst (indicating blockage) was more significant with the lignite coal than with subbituminous coal.

30. The performance of SCR with lignite coal is of particular concern.

31. The W.A. Parish facilities (Parish) in Fort Bend County, Texas, use SCR with PRB subbituminous coal. Ash deposition at Parish has been a problem.

32. Lignite has a higher ash content than subbituminous coal.

33. Blockage of an SCR reactor by ash deposits restricts exhaust gas flow, further inducing maldistribution in velocity and possibly the NH_3 (ammonia) and NO mixing that is necessary for reduction of NO_x by the SCR.

34. Lignite ash deposition problems are exacerbated by popcorn or large ash (LPA), which are ash particles greater than 4mm and featuring an aspect ration of 1.5 or greater.

35. LPA can significantly plug flow channels within the SCR reactor, which essentially removes the plugged channel from participating in the reaction.

36. It is impossible to project whether LPA will be manageable for lignite SCR applications.

37. Even with modest success with different protection screens or baffles, near-complete removal of LPA is required to eliminate it as a concern for lignite SCR applications.

38. The design of an SCR reactor for lignite-coal firing must address several issues that have never been implemented as a complete system with either lignite or any other coal.

39. A commercial-scale test is required to secure the design specifics of an SCR reactor for lignite-coal firing and to assure confidence in its broad commercial application.

40. There has been no commercial-scale testing or long-term use of SCR with lignite anywhere in the United States.

41. TXU has conducted a series of exploratory in-situ reactor tests to evaluate the performance of several catalyst samples at its Martin Lake Station; yet those tests only explored the chemistry of interactions of the ash inorganic compounds with the catalyst.

42. Although by September 2006, TXU plans to install an SCR pilot plant treating a slipstream of exhaust gas from its lignite-fired Sandow Unit No. 4, this pilot test has not yet occurred.

43. The world standard for SCR reactors is to use 1.1 cubic meters of catalyst.

44. For its NO_x calculations, Oak Grove assumed an oversized SCR with 1.4 cubic meters of catalyst. However, no testing or other analysis supports Oak Grove's assumption that more catalyst will solve the problems of using lignite with an SCR reactor.

45. PRB subbituminous coal has a high volatile fraction and low moisture that allow the flame in the boilers to stabilize quickly and support the low-NO_x attributes of the firing system. As a result, subbituminous coal can be controlled with low-NO_x burners and over-fired air to as low as 0.10 lb/MMBtu coming out of the boiler (before entering the SCR).

46. Lignite's higher moisture content and lower volatility interfere with the ability of the low-NO_x burners and over-fired air to inherently control NO_x within the boiler.

47. NO_x rates of boilers using Texas Wilcox lignite range from 0.20 to 0.24 lb/MMBtu.

48. The degree of NO_x reduction achieved by the SCR to deliver a specific level of outlet NO_x must necessarily be higher with the use of lignite than with PRB coal.

49. Oak Grove failed to establish by a preponderance of the evidence that its proposed NO_x control technology would achieve the 0.08 lb/MMBtu NO_x emission rate required by the permit.

Mercury

50. For the lignite-fired Units, Oak Grove proposes to use fabric-filter baghouses and treated activated carbon injection (ACI) to control emissions of mercury.

51. Oak Grove's proposal to utilize ACI would be the first time an ACI system has been used on Texas lignite-fired units.

52. The permit for the Oak Grove Units establishes a mercury emission limit of 9.2 lb/TrillionBtu (TBtu), or 0.0000092 lb/MMBtu, which equals approximately 92 x 10^{-6} lb/MWh, on a 12-month rolling average.

53. Special Condition 49 of the draft permit provides the following: if Oak Grove is unable to demonstrate compliance with the emission limits for NO_x, mercury, and ammonia within 180 days of initial startup, then Oak Grove may request additional time for an emissions study to mitigate emissions from the Units. Exceedances of the emission limits for NO_x, mercury,

and ammonia during the mitigation study will not be considered a violation of the emission limits or performance standards set forth in the permit.

54. Lignite has three times more mercury than PRB coal.

55. Removal of mercury from lignite is more difficult than from PRB coal because lignite has a higher percentage of elemental (non-oxidized) mercury and a low level of chlorides necessary for mercury oxidation and removal.

56. The mercury emission rate for the Station's Units is 4.5 times greater than the recently permitted Sandy Creek facility that will use PRB coal.

57. In establishing the mercury emission limit of 9.2 lb/TBtu, Oak Grove assumed that the efficiency of its suite of emission controls would be less than Sandy Creek's because Oak Grove's Units will use lignite.

58. The Units would need to achieve a mercury reduction efficiency of 68 to 72 percent (depending on which lignite deposit is used) to achieve the 9.2 lb/TBtu mercury emission limit.

59. The ability of the Units to achieve a 68 to 72-percent mercury removal efficiency necessary to meet the emission limit would require that new and improved carbon sorbent technologies be developed in the future before the Station begins operation.

60. Tests on Texas lignite at TXU's Big Brown facility showed only 15 to 26-percent mercury capture across a fabric-filter-type environment (without ACI).

61. Oak Grove proposes to use ACI, which would help with mercury removal, but no commercial demonstrations of ACI have been conducted with Texas lignite and the fabric-filter environment proposed for the Oak Grove facility.

62. The demonstration that most closely simulated Oak Grove's configuration of using ACI with fabric-filter baghouses to control mercury was a 21-day trial at the W.E. Energies Pleasant Prairie Plant Power Plant (W. E. Energies). That demonstration showed mercury removal was limited to 55 to 60 percent using PRB coal.

63. Pilot tests with ACI performed for TXU at the University of North Dakota showed that Texas lignite has a dominant effect on mercury capture and that, in general, 100-percent Texas lignite fuel had 15 to 30 percent less mercury removal than a 70/30-percent blend of lignite and PRB.

64. A mercury capture of significantly less than the 55 to 60 percent achieved by W.E. Energies would be expected with 100-percent lignite, even with ACI and fabric-filter baghouses.

65. Additional research and testing is needed to demonstrate the potential of ACI technology to remove mercury from 100 percent Texas lignite.

66. While ACI is a promising technology, the mercury control level that can be achieved with ACI and Texas lignite is questionable and has not been demonstrated on any full-scale basis or on an actual unit.

67. ACI technology has a detrimental side-effect of contaminating ash so that it can no longer be used as a concrete additive.

68. During the mercury rulemaking process, no vendor of mercury control systems would guarantee TXU any mercury emission rate for Texas lignite without additional studies.

69. The maximum mercury removal efficiency in a short-term, pilot-scale demonstration for 100 percent lignite using ACI was only 55 percent, well below the 68 to 72-percent removal efficiency that the Oak Grove facility needs to achieve the mercury emission limit in the permit.

70. Because the effect of SCR and the FGD unit on mercury oxidation and removal is speculative (due to the uncertainties of these technologies for mercury control and the low level of mercury oxidation with lignite coal), Oak Grove assumed no contribution from the SCR or FGD for mercury removal at the Station.

71. Oak Grove predicts that it can meet its mercury emissions limit based on new sorbent technology that may be developed before the Oak Grove facility begins operation in 2009.

72. Some proprietary sorbents under development have tested as high as 80 to 90-percent mercury removal on other coals. However, these sorbents have never been tested on Texas lignite and additional work needs to be done.

73. Oak Grove failed to prove that a 68 to 72-percent mercury removal efficiency in a commercial electric generation facility can be achieved at this time with the use of 100-percent lignite.

74. Oak Grove failed to establish by a preponderance of the evidence that its Units would likely be able to achieve the 9.2 lb/TrillionBtu 12-month rolling average mercury emissions limit required by the permit.

BACT Summary

75. Oak Grove failed to prove by a preponderance of the evidence that the controls and associated emission rates for NO_x and mercury that it proposed for the Station represent BACT.

Protection of Public Health and Property

76. Oak Grove failed to establish by a preponderance of the evidence that the Station would comply with the New Source Performance Standard (NSPS) of 0.11 lb/MMBtu for NO_x.

a. The Station's midpoint boiler emission rate of 0.22 lb/MMBtu is double the current NSPS standard for NO_x emissions.

b. The SCR reactor, the Station's only post-combustion NO_x control, has not been shown to be effective with lignite due to ash deposition blockage and catalyst degradation.

77. Oak Grove conducted atmospheric dispersion modeling and prepared air quality impacts analyses to show that the emissions from the Oak Grove facility would comply with the National Ambient Air Quality Standards (NAAQS) and Prevention of Significant Deterioration (PSD) increments and to demonstrate that, as compared to the effects screening levels (ESLs), the facility's maximum expected off-property concentrations of non-criteria pollutants are acceptable.

78. Mercury was one of the trace metallic constituents Oak Grove modeled for comparison with the ESLs.

79. Oak Grove failed to establish that its modeling reflected the actual emissions of NO_x and mercury that would result from the Station.

a. The basis of the Station's source information examined in Oak Grove's modeling were the emissions calculations and BACT analysis provided by TCEQ staff.

b. Oak Grove failed to prove by a preponderance of the evidence that its proposed NO_x and mercury control technologies would likely achieve the required emission rates.

c. Oak Grove's air quality impacts analyses were based on the unproven emission levels set forth in the permit.

80. Oak Grove failed to prove by a preponderance of the evidence that the Station would comply with the NAAQS and the PSD increments.

81. Oak Grove failed to establish by a preponderance of the evidence that, as compared to the ESLs, the Station's maximum expected off-property concentration of the non-criteria pollutant of mercury is acceptable.

82. Oak Grove failed to prove that its proposed source would not cause or contribute to a condition of air pollution.

Transcription Costs

83. The ALJs required a transcript be prepared in this case because the hearing was scheduled to last longer than one day and the case was proceeding under the expedited schedule of the Governor's Executive Order RP49.

84. The reporting and transcription costs totaled $17,393.25.

85. Robertson County: Our Land, Our Lives (Protestant) is a small non-profit organization created as a result of Oak Grove's permit request at issue in this case.

86. Protestant has limited financial resources.

87. Oak Grove is a wholly-owned subsidiary of TXU Energy Company, which itself is a subsidiary of TXU Corporation, a multi-billion-dollar for-profit corporate entity. As such, Oak Grove has the greater financial ability to pay costs.

88. This is the first permit application for a lignite-fired electric generating plant in many years.

89. The expedited schedule under Executive Order RP49 reduced the amount of discovery and resulted in the ED not issuing his response to public comment until after the hearing concluded. These circumstances resulted in more cross-examination of Oak Grove's and the ED's witnesses than otherwise might have been necessary.

90. The questioning of witnesses by all of the attorneys was generally to the point and directed towards relevant issues.

91. Considering that Oak Grove and the ED had the majority of witnesses to be cross-examined (Oak Grove had seven; the ED had three; Protestant had only three), Protestant's cross-examination comprised the majority of the transcript. However, the extent of participation by all the parties was appropriate and none of the parties unduly burdened the transcript with frivolous arguments or unnecessary questioning of witnesses.

92. As the party bearing the burden of proof, Oak Grove could anticipate the greatest potential benefit from an ability to cite and reassemble the information within the record, although all parties benefitted from having a transcript.

93. All parties had plausible, good-faith arguments for the issues they raised.

94. Oak Grove's financial ability and potential benefit from having a transcript weigh in favor of assessing all reporting and transcription costs against Oak Grove.

II. CONCLUSIONS OF LAW

1. The Commission has jurisdiction over Oak Grove's application pursuant to TEX. HEALTH & SAFETY CODE ANN. (Health & Safety Code) Chapter 382 (West 2005) and TEX. WATER CODE (Water Code) Chapter 5 (West 2005).

2. Oak Grove's application was directly referred to SOAH pursuant to WATER CODE § 5.557.

3. SOAH has jurisdiction to conduct a hearing and to prepare a proposal for decision in this matter. TEX. GOV'T CODE ANN. (Gov't Code) § 2003.047 (West 2005).

4. Notice was provided pursuant to 30 TAC § 39.601, *et seq.* (2005), and Gov't Code §§ 2001.051 and 2001.052.

5. Oak Grove submitted its application in compliance with 30 TAC §§ 116.110(f) and 116.140.

6. In a contested case hearing involving an air quality permit application, the burden of proof is on the applicant to prove by a preponderance of the evidence that it met all statutory and regulatory requirements. 30 TAC § 80.17(a).

7. Oak Grove failed to prove by a preponderance of the evidence that the Oak Grove facility would achieve the performance specified in its permit application for NO_x and mercury emissions, as required by 30 TAC § 116.111(a)(2)(G).

8. Based on the above Findings of Fact and Conclusions of Law, Oak Grove failed to prove by a preponderance of the evidence that the emissions from the Station would comply with all Commission rules and regulations and with the intent of the Texas Clean Air Act, including the protection of the health and physical property of the people, as required by 30 TAC § 116.111.

9. Based on the above Findings of Fact and Conclusions of Law, Oak Grove failed to prove by a preponderance of evidence that the Oak Grove facility would not cause or contribute to a condition of air pollution.

10. Based on the above Findings of Fact and Conclusions of Law, Oak Grove failed to prove by a preponderance of the evidence that the Oak Grove facility would not cause adverse health or welfare effects.

11. Based on the above Findings of Fact and Conclusions of Law, Oak Grove failed to prove by a preponderance of the evidence that the Oak Grove facility would utilize BACT for NO_x and mercury, as required by Health & Safety Code § 382.0518(b)(1) and 30 TAC § 116.111(a)(2)(C), and with consideration given to the technical practicability and economic reasonableness of reducing or eliminating such emissions from the facilities.

12. Based on the above findings of fact and conclusions of law, Oak Grove failed to prove by a preponderance of the evidence that the NO_x emissions from the Units would meet the requirements of the applicable NSPS as listed under Title 40 C.F.R. Part 60, promulgated by the EPA under authority granted under Section 111 of the Federal Clean Air Act, as amended.

13. Based on the above findings of fact and conclusions of law, Oak Grove failed to prove by a preponderance of the evidence that the Station would comply with the NAAQS.

14. Based on the above findings of fact and conclusions of law, Oak Grove failed to prove by a preponderance of the evidence that the Station would comply with the PSD increments.

15. Based on the above findings of fact and conclusions of law, Oak Grove failed to prove by a preponderance of the evidence that, as compared to the ESLs, the Station's maximum expected off-property concentration of the non-criteria pollutant of mercury is acceptable.

16. Based on the Findings of Fact and Conclusions of Law, and in accordance with Health & Safety Code § 382.0518(b), Oak Grove's application for Air Quality Permit Nos. 76474 and PSD-TX-1056 should be denied and Air Quality Permit Nos. 76474 and PSD-TX-1056 should not be issued.

NOW, THEREFORE, IT IS ORDERED BY THE TEXAS COMMISSION ON ENVIRONMENT QUALITY THAT:

1. The application of Oak Grove Management Co., LLC, for Air Quality Permit Nos. 76474 and PSD-TX-1056 is denied.

2. Oak Grove shall pay all transcription and reporting costs in the total amount of $17,393.25.

3. All other motions, requests for entry of specific findings of fact or conclusions of law, and any other requests for general or specific relief, if not expressly granted herein, are hereby denied.

4. The effective date of this Order is the date the Order is final, as provided by 30 TAC § 80.273 and Gov't Code § 2001.144.

5. The Commission's Chief Clerk shall forward a copy of this Order to all parties.

6. If any provision, sentence, clause, or phrase of this Order is for any reason held to be invalid, the invalidity of any provision shall not affect the validity of the remaining portions of this Order.

ISSUED:

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Kathleen Hartnett White, Chairman
For the Commission