State Office of Administrative Hearings

Cathleen Parsley
Chief Administrative Law Judge

June 23, 2009

Les Trobman, General Counsel
Texas Commission on Environmental Quality
PO Box 13087
Austin Texas 78711-3087

Re: SOAH Docket Nos. 582-08-0861 and 582-08-4013; TCEQ Docket Nos. 2007-1820-AIR and 2008-1210-AIR; Application of NRG Texas Power LLC for State Air Quality Permit 79188, Prevention of Significant Deterioration Air Quality Permit PSD-TX-1072, and MACT HAP-14 Permit

Dear Mr. Trobman:

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 July 13, 2009. Any replies to exceptions or briefs must be filed in the same manner no later than July 23, 2009.

This matter has been designated **TCEQ Docket Nos. 2007-1820-AIR and 2008-1210-AIR; SOAH Docket Nos. 582-08-0861 and 582-08-4013**. 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 seven 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,

Craig R. Bennett
Administrative Law Judge

Tommy L. Broyles
Administrative Law Judge

CRB/ls
Enclosures
cc: Mailing List

STATE OFFICE OF ADMINISTRATIVE HEARINGS

AUSTIN OFFICE
300 West 15th Street Suite 502
Austin, Texas 78701
Phone: (512) 475-4993
Fax: (512) 475-4994

SERVICE LIST

AGENCY: **Environmental Quality, Texas Commission on (TCEQ)**

STYLE/CASE: **NRG TEXAS POWER, LLC**

SOAH DOCKET NUMBER: **582-08-0861**

REFERRING AGENCY CASE: **2007-1820-AIR**

STATE OFFICE OF ADMINISTRATIVE HEARINGS	**ADMINISTRATIVE LAW JUDGE**
	ALJ CRAIG R. BENNETT
REPRESENTATIVE / ADDRESS	**PARTIES**
DEREK R. MCDONALD BAKER BOTTS, L.L.P. 1500 SAN JACINTO CENTER 98 SAN JACINTO BOULEVARD AUSTIN, TX 78701 (512) 322-2667 (PH) (512) 322-8342 (FAX) derek.mcdonald@bakerbotts.com	NRG TEXAS POWER LLC
GARRETT ARTHUR STAFF ATTORNEY TEXAS COMMISSION ON ENVIRONMENTAL QUALITY OFFICE OF PUBLIC INTEREST COUNSEL MC-175 P.O. BOX 13087 AUSTIN, TX 78711-3087 (512) 239-5757 (PH) (512) 239-6377 (FAX) garthur@tceq.state.tx.us	OFFICE OF THE PUBLIC INTEREST COUNSEL
WENDI HAMMOND ATTORNEY 7325 AUGUSTA CIRCLE PLANO, TX 75025 (972) 746-8540 (PH) (469) 241-0430 (FAX) wendi@TexasEnvironmentalLaw.net	ROBERTSON COUNTY: OUR LAND, OUR LIVES (RCOLOL)

ILAN M. LEVIN
ATTORNEY
ENVIRONMENTAL INTEGRITY PROJECT
1303 SAN ANTONIO STREET, SUITE 200
AUSTIN, TX 78701
(512) 637-9477 (PH)
(512) 584-8019 (FAX)
ilevin@environmentalintegrity.org

SIERRA CLUB

BOOKER HARRISON
SENIOR ATTORNEY - AIR
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
ENVIRONMENTAL LAW DIVISION
MC-173 P.O. BOX 13087
AUSTIN, TX 78711-3087
(512) 239-4113 (PH)
(512) 239-0606 (FAX)
booharri@tceq.state.tx.us

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

THOMAS WEBER
MCELROY, SULLIVAN, MILLER LLP
200 P. O. BOX 12127
AUSTIN, TX 78711
(512) 327-8111 (PH)
(512) 327-6566 (FAX)
tweber@msmtx.com

VALENCE OPERATING COMPANY

CHARLES IRVINE
BLACKBURN & CARTER, P.C.
4709 AUSTIN
HOUSTON, TX 77004
(713) 524-1012 (PH)
(713) 524-5165 (FAX)
charles@blackburncarter.com

DOUGLAS W. RAY

CHARLES E. MORGAN
EXECUTIVE DIRECTOR
CITIZENS FOR ENVIRONMENTAL CLEAN-UP
609 E. F.M. 489
BUFFALO, TX 75831
(903) 389-5616 (PH)
cemorgan75831@yahoo.com

CITIZENS FOR ENVIRONMENTAL CLEAN-UP

LAYLA MANSURI
ATTORNEY
ENVIRONMENTAL INTEGRITY PROJECT
1303 SAN ANTONIO STREET
AUSTIN, TX 78701
(512) 637-9477 (PH)
(512) 584-8019 (FAX)
lmansuri@environmentalintegrity.org

SIERRA CLUB

JOHN M. QUINLAN
MCELROY, SULLIVAN & MILLER, L.L.P.
P. O. BOX 12127
AUSTIN, TX 78711
(512) 327-8111 (PH)
(512) 327-6566 (FAX)

VALENCE OPERATING COMPANY

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xc: Docket Clerk, State Office of Administrative Hearings

SOAH DOCKET NOS. 582-08-0861 and 582-08-4013
TCEQ DOCKET NOS. 2007-1820-AIR and 2008-1210-AIR

APPLICATION OF NRG TEXAS POWER LLC FOR STATE AIR QUALITY PERMIT 79188, PREVENTION OF SIGNIFICANT DETERIORATION AIR QUALITY PERMIT PSD-TX-1072, AND MACT HAP-14 PERMIT	**§**	**BEFORE THE STATE OFFICE OF ADMINISTRATIVE HEARINGS**

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PROPOSAL FOR DECISION

I. INTRODUCTION

On June 12, 2006, NRG Texas Power LLC (NRG) filed an application with the Texas Commission on Environmental Quality (TCEQ or Commission) for State Air Quality and federal Prevention of Significant Deterioration (PSD) permits to construct a new 800 megawatt (MW) coal-fired electric generating unit and related facilities (the Limestone Unit 3 project) at NRG's existing Limestone Electric Generating Station (Limestone Station). On October 8, 2007, the Executive Director (ED) of the TCEQ issued the draft permit after concluding that NRG had satisfied all applicable requirements related to best available control technology (BACT) and ensuring that the Limestone Unit 3 project would be protective of public health and property. However, the requested permits were opposed by other parties, and the Commission referred the matter to the State Office of Administrative Hearings (SOAH) for a contested case hearing.

Subsequently, in March 2008, the United States Court of Appeals for the District of Columbia issued a decision requiring compliance with maximum achievable control technology (MACT) requirements for facilities such as the Limestone Unit 3 project. Based upon this court decision, NRG filed a separate application concerning the newly imposed MACT requirements. The MACT application sought an additional air quality permit that would establish federally-enforceable MACT emission limits for several pollutants, including mercury. The MACT application was reviewed and determined to be administratively and technically complete by the ED on July 18, 2008. The MACT application was then referred to SOAH and consolidated for hearing with the previously-pending State Air Quality and federal PSD permit applications. All of these applications are addressed by this Proposal for Decision.

On February 23-27, 2009, the hearing on the merits convened before Administrative Law Judges (ALJs) Tommy L. Broyles and Craig R. Bennett. The following parties appeared and participated in the hearing: (1) NRG; (2) the Sierra Club; (3) Robertson County Our Land Our Lives (RCOLOL); (4) Valence Operating Company (Valence); (5) Douglas Ray; (6) Citizens for Environmental Clean-Up (CEC); (7) the ED; and (8) the Office of Public Interest Counsel (OPIC). The record closed on April 24, 2009, after written closing arguments were filed.

NRG and the ED believe that the permits should be issued. All other parties are opposed to the issuance of the permits (therefore, the Sierra Club, RCOLOL, Valence, Mr. Ray, CEC, and OPIC are collectively referred to as "Protestants"). After considering the evidence and arguments presented, the ALJs conclude that NRG has satisfied applicable requirements and recommend that the Commission issue the requested State Air Quality and PSD permits to NRG, as modified by the following recommendations:[1]

- Lower the total PM/PM_{10} emissions limit to 0.025 lb/MMBtu (annual average)
- Lower the 30-day rolling average emissions limit for NO_x to 0.06 lb/MMBtu
- Lower the 30-day rolling average emissions limit for CO to 0.12 lb/MMBtu
- Include modified Special Conditions No. 42 and 43, which require no net increase in emissions of SO_2, NO_x, and mercury for the Limestone Station facility
- Include Special Condition No. 44, requiring NRG to erect a physical barrier (fencing or otherwise) around the Limestone Station property line or the boundary used for air dispersion modeling before Limestone Unit 3 is constructed

However, the ALJs are concerned with the sufficiency of NRG's MACT demonstration, because NRG has not identified a control technology it will use at Limestone Unit 3 for controlling mercury. Based upon their reading of the applicable MACT rules, the ALJs conclude that NRG's failure to identify a selected mercury control technology that can meet the proposed

[1] The State Air Quality permit and federal PSD permit have separate identifying numbers (State Air Quality Permit No. 79188 and PSD Permit No. PSD-TX-1072), but are essentially a single permit. *See* NRG Ex. 8 and ED Ex. 10. The MACT application seeks a separate HAP permit, Permit No. HAP-14. *See* NRG Ex. 9 and ED Ex. 13.

emission limits is a fatal defect in the MACT demonstration. Therefore, the ALJs recommend either remand or denial of the MACT application based upon this deficiency.[2]

However, the ALJs recognize this determination could be seen as an elevation of form over substance, because the ALJs also find that the mercury emissions limits themselves proposed by NRG are representative of MACT. If, for policy reasons, the Commission interprets the MACT requirements differently and finds that NRG is not required to identify and analyze a control technology for mercury, then the ALJs recommend issuance of the HAP-14 permit.

II. APPLICABLE LAW

Under TEX. HEALTH & SAFETY CODE § 382.0518(b), the Commission shall grant a permit to construct a facility such as the Limestone Unit 3 project if the Commission finds:

> (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 [the Clean Air Act], including protection of the public's health and physical property.

Under the Commission's rules—particularly 30 TEX. ADMIN. CODE § 116.111—an applicant for an air quality permit must include in its application information which demonstrates that emissions from the facility will meet BACT (with consideration given to the technical practicability and economic reasonableness of reducing or eliminating the emissions from the facility) and that the proposed facility will achieve the performance specified in the permit application.

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[2] Under TEX. HEALTH & SAFETY CODE § 382.0518(d) and (e), permit applicants are given an opportunity to address and correct anticipated emissions that will violate standards. Although perhaps not directly applicable to the MACT application, that provision might allow NRG the opportunity to correct its MACT defects in this case.

Further, the Commission's rules at 30 TEX. ADMIN. CODE § 116.160 (regarding PSD requirements) provides requirements with which each proposed new major source in an attainment or unclassifiable area must comply. Those requirements include 40 C.F.R. § 52.21(k) (a federal requirement adopted by reference), concerning source impact analysis. In relevant 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 [national ambient air quality standard (NAAQS)] in any air quality control region; or
>
> (2) Any applicable maximum allowable increase over the baseline concentration in any area.

In total, these various requirements—along with the MACT demonstrations now required and discussed in detail below—make it clear that the requested permits must be protective of human health and property, must use the maximum achievable control technology, and must not cause or contribute to air pollution in violation of the NAAQS or the maximum allowable increase over baseline concentrations. It is with these applicable requirements, among others, in mind that we now turn to the specific issues raised by the parties.

III. OVERVIEW

A. Description of the Limestone Unit 3 Project

The Limestone Unit 3 Project will consist of a supercritical pulverized coal-fired electric generating unit and related facilities. It will be the third coal-fired steam electric unit at NRG's Limestone Station. Limestone Unit 3 will have a maximum heat input of 8,000 MMBTU/hr, and

will use sub-bituminous coal as the primary fuel source.[3] Secondary fuels—which could be used in a blend with sub-bituminous coal—include Eastern bituminous coal or petroleum coke.[4]

In regard to control technologies, the Limestone Unit 3 Project will utilize low-NO_x burners with overfire air and selective catalytic reduction (SCR) to minimize NO_x emissions; a fabric filter baghouse system to minimize particulate matter (PM) emissions; and a wet limestone flue gas desulfurization (FGD) system to minimize emissions of sulfur dioxide (SO_2), hydrogen chloride (HCl), hydrogen fluoride (HF), and sulfuric acid (H_2SO_4).[5] To reduce H_2SO_4 emissions during periods when petroleum coke or bituminous coals are blended, an alkali injection system will be used upstream of the fabric filter baghouse.

NRG also proposes to use other unspecified control measures (such as halogen or sorbent addition) for the control of mercury emissions, and good combustion practices (*e.g.*, staged combustion) to control emissions of carbon monoxide (CO) and volatile organic compounds (VOCs).[6] NRG does not identify a specific mercury control to be used because it contends the technology is rapidly changing in regard to mercury control, and it wants flexibility to adopt the best technology available when the plant is built to meet the BACT/MACT limits for mercury.

B. Issues to be Addressed

This case involves a direct referral to SOAH for a contested case hearing. Therefore, the Commission has not listed specific issues to be resolved. Instead, NRG has the burden of showing compliance with all applicable state and federal standards. As a practical matter, the contested issues are framed by the Protestants who, through evidence and arguments, identify the principal areas of concern with the permit applications. But, the burden of proof remains on

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[3] NRG Ex. 49, at 5.

[4] NRG Ex. 49, at 5.

[5] NRG Ex. 49, at 19.

[6] NRG Ex. 49, at 19.

NRG to show its applications satisfy all applicable standards and that all requirements have been met for issuance of the permits.

The primary arguments advanced by the Protestants are:

- NRG has not shown that the Limestone Unit 3 project will use the best available control technology (BACT);
- NRG's modeling is based upon improper modeling receptors and unreliable underlying background data and is insufficient to demonstrate no harm to human health or property;
- NRG has failed to demonstrate compliance with the PSD increment limits; and
- NRG has failed to satisfy the case-by-case maximum achievable control technology (MACT) requirements.

These issues are discussed in detail below, along with the other less significant issues raised by the parties in this proceeding.

IV. DISCUSSION

A. NRG's Commitment to No Net Increase of SO_2, NO_x, and Mercury (Hg)

1. NRG's Proposal for Netting

As noted above, NRG already has two other existing electric generation units at the Limestone station. As part of its application in this proceeding, NRG has committed to no net increase of SO_2, NO_x, or Hg emissions from its Limestone station if Limestone Unit 3 is permitted, and has presented what it has called a "formal netting demonstration" for PSD purposes.[7] Further, NRG has proposed—and the ED has included in the draft permit—a special condition (No. 42) mandating that NRG can have no net increase in annual site-wide emissions

[7] NRG Ex. 11; NRG Ex. 2, at 19.

of SO_2, NO_x, or Hg with the addition of Limestone Unit 3.[8] Moreover, NRG contends that compliance with these site-wide emissions caps will be verifiable because NRG will have continuous emissions monitoring systems (CEMS) for all three pollutants on Limestone Units 1, 2, and 3.[9] Therefore, NRG contends that it is not subject to a PSD review for SO_2 or NO_x emissions.

In addition to its commitment to no net increase in the annual emissions of SO_2, NO_x, or Hg, NRG has also agreed to limit the cumulative short-term NO_x emissions (30-day rolling average emissions) from Limestone Units 1, 2, and 3 to actual emissions levels experienced by Limestone Units 1 and 2 during the June-September periods of 2006 and 2007.[10]

2. Protestants' Challenges to NRG's Netting Commitment

Protestants disagree that NRG has provided a proper netting demonstration, so as to "net out" of PSD review. Protestants contend that NRG's netting application was not properly reviewed by the ED and does not satisfy the requirements for a formal PSD netting demonstration. In particular, Protestants highlight the following alleged deficiencies or concerns regarding NRG's netting demonstration:

- The netting demonstration does not show how the netting will be achieved; rather, it is simply a representation by NRG that it will commit to no net increases;
- TCEQ did not consider the netting demonstration and evaluate it, because it was submitted after the draft permit had issued;
- The netting demonstration was not filed with the original application as required;
- The netting demonstration was not done in accordance with EPA guidelines and does not show that the emissions reductions will be "creditable" (achieved before emissions increases occur from new units);

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[8] NRG Ex. 6, at 000658-000660; NRG Ex. 12, at 43-44; NRG Ex. 2, at 18.

[9] NRG Ex. 2, at 20.

[10] NRG Ex. 2, at 21.

- As part of its netting demonstration, NRG made representations that were not true (e.g., checking boxes indicating that "the reductions occurred within the contemporaneous period" and "the reductions will be federally enforceable by the start of construction," and stating the netting demonstration was required—none of which were true);

- If NRG has modified Units 1 and 2 to meet the netting commitment, then such modifications may have required PSD review and a showing that BACT was being used for the units. If so, then the allowed emissions from Units 1 and 2 would likely be lower than reported in the netting analysis, in turn causing NRG's proposed caps for NO_x, SO_2, and Hg to be invalid; and

- NRG's commitment to good combustion practices to achieve no net increase is not enforceable, because "good combustion practices" are not a defined term.

In addition to this list of issues, Protestants contend that the proposed emissions decrease from Limestone Units 1 and 2 will not be qualitatively similar to the expected increase in emissions from Limestone Unit 3. In particular, Protestants point out that Limestone Units 1 and 2 have existing practical limitations on the volume of emissions occurring on an hourly, daily, or monthly basis. But, under the proposed annual cap on emissions, emissions from all three units can be distributed in varying amounts throughout the year, resulting in higher actual emissions during any given hourly, daily or monthly period than currently exist.

As an example, RCOLOL notes that NRG could choose to use only its most efficient unit, burning more expensive (and less polluting) coal, during periods of low electricity demand. This would result in very low emissions during that time period. In contrast, during peak periods of demand, NRG could choose to use all three units to burn less expensive (and more polluting) coal to meet high demand. This would result in high emissions during the peak periods. But, when offset with the very low emissions at other times, there might still be compliance with the annual cap. However, the harm to the public would be greater, because there would be higher emissions than currently exist during peak periods of demand. Since NRG has not shown how it will achieve the netting, Protestants argue that this scenario must be considered and, consequently, shows that the proposed emissions reductions may not be qualitatively similar in the impact to public health. And, if the emissions are not qualitatively similar, then the PSD

netting requirements are not met. For this reason, and the other reasons identified above, Protestants argue that NRG's netting demonstration should be given no weight.

3. NRG's Response to Protestants' Challenges

NRG disagrees that its proposed emissions reductions will not be qualitatively similar, noting that the TCEQ's rules utilize a tons per year (tpy) basis for demonstrating no net increase in emissions. Specifically, the TCEQ's definition of the "netting" analysis states:

> The summation of the proposed project emissions increase in tons per year with all other creditable source emission increases and decreases during the contemporaneous period is compared to the significant level for the pollutant. If the significant level is exceeded, then [PSD] and/or nonattainment review is required.[11]

Thus, NRG contends that its method of calculating the emissions netting was consistent with TCEQ rules, and Protestants have identified no requirement that additional netting reviews must be conducted using other time periods, such as hourly or daily.

NRG also disputes that Special Condition No. 42—which requires no net increases on an annual basis—will not be federally enforceable simply because the method of achieving the netting is not specified. Because Special Condition No. 42 will be a permit requirement, NRG asserts it will have to comply with it and the method of compliance does not change its enforceability. Moreover, NRG proposes to use continuous emissions monitoring at the Limestone facility, so emissions will be measurable and compliance with the permit conditions will be enforceable in that manner.

NRG also disagrees that its proposed emissions reductions will not be contemporaneous with emissions increases. NRG relies on the TCEQ's definition of the "contemporaneous" period, which is defined as "the period between (A) the date that the increase from the particular change occurs; and (B) 60 months prior to the date that construction on the particular change

commences."[12] NRG's testimony indicated that NRG intends to have all necessary emissions reductions in place to ensure there will be no net increase in emissions once Limestone Unit 3 starts operating.[13] Moreover, NRG has indicated that it will agree to the inclusion of new language in the permit making it clear that the emission caps established in Special Condition No. 42 shall apply on initial start-up of Limestone Unit 3. Thus, NRG contends that the required decreases of NO_x and SO_2 under Special Condition No. 42 will be contemporaneous, qualitatively similar, and federally enforceable—therefore establishing a valid basis for PSD netting.

4. ALJs' Netting Analysis

Ultimately, the ALJs conclude that NRG's proposed netting demonstration does not adequately satisfy the netting demonstration requirements contained in the applicable state and federal rules. Specifically, the EPA's netting demonstration guidance indicates that the reviewing agency is to take any increases in actual emissions from a change in operation and add any increases or subtract any decreases in actual emissions that are contemporaneous with the change and are otherwise creditable.[14] To be creditable, the EPA's new source review (NSR) guidance manual states that "the actual reduction must take place before the date that the emissions increase from any of the new or modified emissions units occurs."[15]

In this case, NRG proposes to have no net increase and agrees to the use of Special Condition No. 42. However, NRG has not proposed the precise method of achieving the netting and does not propose to implement an actual and measurable decrease in emissions from Limestone Units 1 and 2 (or other existing facilities causing emissions at the site) before

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[11] 30 TEX. ADMIN. CODE § 116.12(12).

[12] 30 TEX. ADMIN. CODE § 116.12(11).

[13] Tr. at 60-63.

[14] NRG Ex. 32, at A.37.

[15] NRG Ex. 32, at A.38 (emphasis added); NRG Ex. 32, at A.47-48.

Limestone Unit 3 begins operating. Rather, Special Condition No. 42 originally required the reduction in emissions only after initial compliance of Limestone Unit 3 was demonstrated. NRG has since agreed to modify Special Condition No. 42 to make it clear that the emissions limits shall apply on start-up of Limestone Unit 3. But, even with this change, there is no federally enforceable requirement for emissions reductions to be implemented before start-up, as required by both the EPA's NSR guidance document and the TCEQ's own rules.[16]

In reality, what NRG presents is not really a netting demonstration. Rather, it is a commitment to no net increases. This is a significant distinction. While NRG's commitment is good and may ultimately satisfy the underlying purposes of the PSD netting rules, it is not the same as making a demonstrable showing of an actual reduction of emissions that will be achieved. A netting demonstration should be more than simply a promise not to increase emissions. Rather, it should be based upon demonstrable and verifiable data showing the specific actual decreases expected and how those decreases are to be achieved (so as to make them certain and verifiable). In fact, the EPA's NSR guidance document notes that "when any emissions decrease is claimed (including those associated with the proposed modification), all source-wide creditable and contemporaneous emissions increases and decreases of the pollutant subject to netting must be included in the PSD applicability determination."[17] This language anticipates an actual evaluation of increases and decreases that will occur as part of federally-enforceable requirements, not simply a representation that no net increases will occur without a specific identification of the sources of the increases or decreases and their amounts.

NRG has not provided a proper showing in this case. Its PSD netting demonstration is essentially contained in NRG Ex. 11 and related testimony, and it simply reflects current emissions and then a summary statement (projection) that total cumulative emissions with

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[16] The ALJs construe this requirement in TCEQ's rules because of the definition of the contemporaneous period, which includes the time "between" (but not specifically including) the increase of emissions associated with the start-up of the new unit or modification and the 60 months prior to that. 30 TEX. ADMIN. CODE § 116.12(11)-(12). Therefore, the contemporaneous period ends when the new (increased) emissions begin. Thus, any reductions have to be achieved *before* the new (increased) emissions begin.

[17] NRG Ex. 32, at A.36 (emphasis in original).

Limestone Unit 3 operating will not increase. It does not contain data showing actual reductions in emissions to be achieved before Limestone Unit 3 is operating, nor specifically from which unit those reductions will occur, nor how those emissions will be decreased. Thus, the ALJs are not convinced that NRG's proposal to have no net increase actually satisfies the EPA's method for determining creditable emissions reductions.

Further, TCEQ has conducted no actual review of NRG's proposed netting demonstration. Because the netting demonstration was submitted after TCEQ staff completed its BACT review for the state air quality/PSD permit, the staff merely reviewed the written documentation and filed it away without conducting any substantive review or analysis of it—treating it simply as a commitment (as opposed to an actual demonstration). The TCEQ permit reviewer testified that he just "[P]ut it in the file. Read it, evaluated it, and put it in the file."[18] Further, when asked what his evaluation consisted of, the following exchange took place:

Q: What did the evaluation part of – what was included in the evaluation before it got put in the file?

A: Well, it didn't change my review. It didn't change BACT, and the PSD review for NO_x and SO_2 had already been done and modeled. So it's a commitment. It's a more formal commitment on their part to have no increase at the site.

Q: Was there any guidance that you compared it against to see whether it was – the calculations were properly done, for example?

A: No. Any guidance?

Q: Sure.

A: If I had assumed – for netting, if they were trying to net out of NO_x and SO_2, then we would have looked, but the netting itself doesn't impact the permit review.

Q: Why is that?

[18] Sierra Club Ex. 40, at 57.

A: Because it had already been done without the netting. It was acceptable without the netting. Netting it out just makes it better from the environmental point of view.

Q: Okay. Well, what's different then? What makes it better?

A: The emissions will not be – in the initial review there was an increase in NO_x and SO_2 and mercury above what was already at the site. Now there's not.

Q: And what's happening physically that's causing there not to be an increase?

A: They have committed to reducing emissions from Units 1 and 2.[19]

In his later testimony, Mr. Linville conceded that he had no idea how NRG specifically intended to satisfy its commitment to no increase in emissions.[20] So, it is clear from the evidence that TCEQ staff engaged in no evaluation or validation of NRG's netting demonstration, but instead treated it simply as a future commitment, rather than a demonstration. Therefore, the ALJs conclude that NRG has failed to proffer a netting demonstration sufficient to allow it to avoid BACT analysis for NO_x and SO_2.

However, the ALJs do not find any of the other challenges raised by Protestants to have merit. The EPA NSR guidance states that "[C]urrent EPA policy is to assume that an emissions decrease will have approximately the same qualitative significance for public health and welfare as that attributed to an increase, unless a reviewing agency has reason to believe that the reduction in ambient concentrations from the emissions decrease will not be sufficient to prevent the proposed emissions increase from causing or contributing to a violation of any NAAQS or PSD increment."[21]

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[19] Sierra Club Ex. 40, at 57-58.

[20] Sierra Club Ex. 40, at 58-59.

[21] NRG Ex. 32, at A.39.

Therefore, the presumption is that the emissions decreases and increases will have the same qualitative significance, and NRG is not required to present evidence on this unless there has been a reason to believe otherwise. Although Protestants speculate that there might be qualitative differences, based upon different operating practices and fuels, they have offered no factual basis for believing their scenario is likely or expected, and the TCEQ has not raised such a concern. Therefore, NRG is under no obligation to present evidence establishing that there will be no qualitative difference, and Protestants' mere speculation about that possibility is not sufficient to create an issue.

Similarly, the ALJs do not find that either NRG's failure to submit the netting demonstration with the original application or the incorrectly checked boxes in the netting demonstration form are fatal to a netting demonstration. Those represent arguments of form over substance, and the ALJs do not find that such an approach would be a proper basis for analyzing a netting demonstration, particularly under the unusual circumstances of this case where a subsequent court decision impacted the environmental review required in this case. So, the ALJs decline to find that Protestants' other challenges to NRG's proposed netting demonstration present a legitimate ground for finding it insufficient. But, because the ALJs nonetheless find that NRG's proposed netting demonstration is no demonstration at all—but simply a commitment—and does not comply with the requirements for a netting demonstration, the ALJs conclude that a PSD BACT analysis is still required for NO_x and SO_2. Therefore, the ALJs now turn to that issue.

B. BACT Analysis

As noted above, under TEX. HEALTH & SAFETY CODE § 382.0518(b)(1), NRG is required to demonstrate that its proposed facility will use best available control technology. However, as a practical matter, the analysis used by the TCEQ and other regulatory agencies does not really entail a specific determination of the control technology that must be used by NRG, as much as it focuses on the results to be achieved. Namely, the purpose of the BACT analysis is to develop

emission limits for various pollutants that are achievable using BACT. So, the BACT analysis in this case is not focused on identifying the actual technology that NRG must utilize at the Limestone Unit 3 facility, but rather on the emission limits to be contained in the permits in light of BACT.[22] Obviously, the technology to be used is significant, because it will impact the expected ability of the facility to achieve the BACT emission limits. But, the BACT analysis is not designed to identify technologies, as much as it is designed to identify achievable emissions limits.

The parties disagree significantly on the propriety of NRG's BACT analysis. One of the key problems is how one establishes the "best available control technology." The Commission has previously considered and decided the methodology for determining BACT, but the Protestants argue that the Commission's past interpretation is not consistent with federal law and should not be relied upon. NRG and the ED disagree, and contend that the Commission's past precedent is to be followed. Ultimately, as discussed below, the ALJs agree that the Commission's approach is to be followed. However, even with that determination, there are a number of issues with NRG's BACT analysis.

Although NRG's BACT evidence in regard to some contested issues is not very robust, the ALJs still ultimately conclude that NRG's BACT analysis is adequate—except in regard to the 30-day rolling averages for NO_x and CO, and the annual limit for total PM/PM_{10}. For those pollutants, the ALJs conclude that some adjustments in the proposed emissions limits must be made before the permit limits could be said to truly represent BACT. Therefore, the ALJs recommend adjustments to the proposed permit limits for those three pollutants. With those adjustments, though, the ALJs conclude that NRG's BACT demonstration will be sufficient.

Now, the ALJs turn to the actual analysis of the BACT issues. The ALJs start first with the Commission's past guidance and precedent on the BACT analysis.

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[22] *See, e.g.*, NRG Ex. 12, at 20; ED Ex. 1 at 7-8; NRG Ex. 71, at 7; and Tr. at 658-659.

1. TCEQ Guidance on BACT

The TCEQ has provided a guidance document entitled "Evaluating Best Available Control Technology (BACT) in Air Permit Applications," which sets forth the guidance for evaluation of BACT proposals submitted in a New Source Review (NSR) air permit application.[23] The guidance document notes that the TCEQ BACT evaluation is conducted using a "tiered" analysis approach, involving three different tiers.

A **Tier I** evaluation involves a comparison of the applicant's BACT proposal to emission reduction performance levels accepted as BACT in recent permit reviews involving the same process or industry. However, the guidance document notes that in some cases, "evaluation of new technical developments may also be necessary."[24] A **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. A **Tier III** evaluation is a detailed technical and quantitative economic analysis of all emission reduction options available for the process under review. The guidance document notes that "technical practicability is established through demonstrated success of an emission reduction option based on previous use, and/or engineering evaluation of a new technology."[25] The guidance document also notes that the "Tier III evaluation is rarely necessary because technical practicability and economic reasonableness have usually been firmly established by industry practice as identified in the first two tiers." [26]

So, essentially, the TCEQ's practice is to look first at other permits involving the same process or industry to see what has been determined achievable. Then, adjusting for differences in the specific process used, the fuels to be burned, and any other known variables that might cause justifiable variations in emissions, the previously accepted emission rates are applied to the

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[23] NRG Ex. 31.

[24] NRG Ex. 31, at 3.

[25] NRG Ex. 31, at 3-4.

[26] NRG Ex. 31, at 4.

proposed facility. This is a bit of an oversimplification, but it summarizes the gist of the TCEQ's existing procedures for conducting the BACT analysis.

In contrast, the EPA uses a "top-down" approach for BACT analysis. The EPA analysis requires the following steps: (1) identify all potential control technologies; (2) eliminate technically infeasible options; (3) rank remaining control technologies by control effectiveness; (4) evaluate the most effective controls and document the results; and (5) select the BACT by choosing the best technology not eliminated in step four (based upon concerns regarding collateral energy, environmental, or economic impacts).[27] This approach inherently focuses on the technologies available and requires a full analysis of all available control technologies. The TCEQ approach, on the other hand, does not require that same evaluation, since it focuses first (and primarily) on other permits that have been granted and the BACT limits approved in them. With the understanding of the two different approaches in mind, the ALJs now turn to NRG's actual BACT analysis in this case.

2. NRG's BACT Analysis

In its State Air Quality/PSD application, NRG includes a full BACT analysis performed by Shaw Environmental, Inc., with review and input from NRG personnel. NRG utilized the TCEQ's three-tier approach, concluding that only the first tier evaluation was needed because there were a large number of recent permits involving the same industry or processes as the Limestone Unit 3 project, thus enabling a good determination of BACT. NRG's BACT analysis considered over 40 pulverized coal-fired power plants, of which 10 were located in Texas. Of the total considered, approximately half had draft or final permits dated in 2006 or 2007. In addition to looking at the permits for these other facilities, NRG considered information from vendors and engineering experts on the most realistic emissions limits available with BACT. Based upon its review of the other permits, its knowledge of the technology available, and the specific processes to be used at Limestone Unit 3, NRG developed BACT emissions limits as

[27] Sierra Club Ex. 15, at 21-22.

shown on the following charts (the limits also represent MACT, unless otherwise noted by a footnote):[28]

Standards Demonstrated by Continuous Monitoring Systems

Pollutant	Performance Standard	Compliance Averaging Period
NO_x	0.070 lb/MMBtu	30-day rolling
	0.050 lb/MMBtu	12-month rolling
SO_2	0.10 lb/MMBtu	30-day rolling
	0.06 lb/MMBtu	12-month rolling
CO	0.15 lb/MMBtu	30-day rolling
Hg	0.02 lb/GWh[29]	12-month rolling
NH_3	10 ppm	3-hour average

Standards Demonstrated by Reference Method (RM) Testing

Pollutant	Performance Standard	Compliance Averaging Period
PM/PM_{10} (filterable)	0.015 lb/MMBtu[30]	Annual
Total PM/PM_{10}	0.035 lb/MMBtu	Annual
VOC	0.0036 lb/MMBtu	Annual
H_2SO_4	0.0075 lb/MMBtu	Annual
HCl	0.0023 lb/MMBtu	Annual
HF	0.0007 lb/MMBtu[31]	Annual

[28] NRG Ex. 49, at 22-23; ED Ex. 10, at 4-5; ED Ex. 9, at 2-4.

[29] The proposed emissions limit for Hg (mercury) is less under the case-by-case MACT analysis. Specifically, NRG proposes a sliding scale emissions limit, ranging between 0.012 lb/GWh and 0.015 lb/GWh, based upon the fuel burned.

[30] In the MACT application, NRG reduced the emissions limit for filterable PM down to 0.012 lb/MMBtu.

[31] In the MACT application, NRG has reduced the emissions limit for HF down to 0.0005 lb/MMBtu.

These limits are supported as being consistent with BACT by the testimony of numerous experts retained by NRG, as well as by the ED's technical staff.[32] In addition, NRG's expert testimony further indicated there are no known technical developments (that are both technically practicable and economically reasonable) that offer the potential for further emissions reductions.[33] Therefore, NRG contends that these limits represent BACT.

3. BACT Analysis Issues Raised by Protestants

The Protestants raise numerous challenges to NRG's BACT analysis. These issues are discussed under separate headings below, along with NRG's response and the ALJs' analysis. However, before discussing the individual issues, the ALJs find it necessary to lay out a concern that underlies many of these issues. Specifically, the Commission's determination of these issues will depend greatly on the burden of proof it places on NRG. In numerous instances, Protestants have raised concerns to which NRG has provided only a cursory response or, in some cases, no direct evidentiary response at all. Similarly, NRG's briefing often fails to adequately address an issue in detail, so the ALJs relied upon the testimony of NRG's witnesses in order to deduce NRG's position on the issue.

For example, in regard to CO emissions, Protestants have identified new burners that have been demonstrated in testing as being effective for controlling NO_x and CO simultaneously, whereas older technologies have required a trade-off in those emissions. Protestants also have identified other permits with lower CO emissions limits. Yet, NRG's briefing does not address this at all. Rather, NRG's sole statement in its closing brief regarding the proposed CO emissions is a single bullet point, stating "For CO, 'BACT is the use of good combustion practices to minimize the products of incomplete combustion and achieve 0.15 lb/MMBtu (30-day average)'" combined with one statement that the evidence in the record supports these

[32] *See, e.g.*, ED Ex. 1 (testimony of James Linville, P.E.); NRG Ex. 49 (testimony of William Frazier, Ph.D.); NRG Ex. 71 (testimony of Colin Campbell); NRG Ex. 24 (testimony of John Klumpyan, P.E.); NRG Ex. 2 (testimony of Ben Carmine, P.E.); and NRG Ex. 26 (testimony of Brian Gunzelman, P.E.).

[33] NRG Ex. 24, at 19.

emissions limits as being consistent with other permits that have stringent NO_x emissions limits.[34] Then, NRG's reply brief gives no additional discussion, stating merely that the basis for the BACT determinations "is discussed in detail in Applicant's Closing Brief."[35] Thus, the ALJs are left to parse the evidentiary record to try to determine whether there is any evidentiary rebuttal to Protestants' evidence.

Ultimately, as discussed in the CO emission limits section below, the ALJs were unable to find any evidence directly addressing Protestants' evidence of new CO technologies. Instead, NRG's expert simply maintained the position that no technologies exist that do not require a trade-off in NO_x and CO emissions. However, this appears inconsistent with the Protestants' evidence related to these new technologies. In this situation, the question then becomes—whose burden is it to analyze these issues? Is it NRG's burden to show that these new technologies are not feasible? Or, is it Protestants' responsibility to demonstrate that any new technologies are suitable for this particular unit and can be utilized to reduce emissions? This basic problem arises in many instances in the BACT analysis where Protestants have raised potentially significant concerns to which NRG has not responded in a manner sufficient to fully address the issues.

However, the ALJs recognize that simply having unresolved concerns or unanswered questions does not necessarily mean that NRG has not proposed to use the best available technology for controlling emissions, nor that the limits it has proposed are not BACT. In fact, it may very well be that no newer technology exists that can be utilized by NRG at Limestone Unit 3. It is just that in many instances the ALJs are unable to conclude that because of unresolved concerns or NRG's failure to fully respond to valid issues raised by Protestants. With this in mind, the ALJs now turn to a detailed discussion of the specific issues raised by the Protestants.

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[34] NRG's Closing Brief, at 34-35.

[35] NRG's Brief in Reply to Closing Arguments, at 22-23.

a. Adequacy of the TCEQ's Three-Tiered BACT Methodology

The Protestants contend that the ED's three-tiered approach to conducting the BACT analysis does not satisfy the purposes behind the BACT requirement. Specifically, they note that BACT is intended to be a technology-forcing standard. By requiring new facilities to utilize the best control technology available at the time, this ensures that new and better control technologies get adopted when they are available. The Protestants note that the ED's approach—which focuses on the standards in previously-issued permits—is actually backward-looking and does not force new technology nor ensure that the best available technology is utilized. Along these lines, Sierra Club cites to a recent statement from the EPA's Environmental Appeals Board (EAB) that if "reviewing authorities let slip their rigorous look at 'all' appropriate technologies, if the target ever eases from the 'maximum degree of reduction' available to something less or more convenient, the result may be somewhat protective, may be superior to some pollution control elsewhere, but will not be BACT."[36]

Protestants note that the EPA's method of conducting a BACT analysis is actually the same as the TCEQ's Tier III, which the TCEQ notes in its guidance documents is rarely needed. Protestants argue that this is indicative of the fact that the TCEQ's approach is not as rigorous as it should be and does not ensure that the "best" control technologies available are actually being reviewed and utilized. As Sierra Club notes in its brief:

> In limiting true BACT determinations to a last resort, this process completely undermines the efficacy of the Act's PSD program. . . . As phrased in a recent court opinion, in a BACT analysis, "the question . . . is not, 'What have other plants achieved in the past?' but rather, "What can this plant achieve for the future?"[37]

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[36] Sierra Club's Closing Arguments, at 13.

[37] Sierra Club's Closing Arguments, at 14-15 [citing *Sierra Club v. Environmental and Protection Cabinet* (Ky.Cir.Ct. Aug. 6, 2007), *rev'd* at No. 2007-CA-001723-MR (Ky.Ct.App. Sept. 19, 2008)].

Protestants argue that the TCEQ's Tier I BACT methodology, which involves a comparison of the applicant's BACT proposal to emission reduction performance levels accepted as BACT in recent permit reviews involving the same process or industry, simply perpetuates existing technology and does not force the use of new and better control technology. Protestants point out that the EPA in 2006 took issue with TCEQ's BACT analysis. Specifically, in regard to the Lake Creek Steam Electric Station Unit 3 in McLennan County, the EPA commented after receiving the draft permit from the TCEQ that there was "no comparison of the proposed control units with other types of control technology for EGUs in recent PSD permits issued nationwide."[38] The EPA then requested that the TCEQ provide "the State's rationale for the BACT determinations, including an analysis of the technical and economic feasibility of available control technologies."[39] Protestants contend that this letter demonstrates the EPA's concern that the TCEQ's approach is inadequate. Therefore, Protestants argue that NRG and the ED should have conducted a top-down analysis like that required by the EPA, because the TCEQ's tiered approach does not ensure BACT, but merely carries on the use of existing technologies that may not be the best available.

In response, NRG disputes all of Protestants' contentions. First, NRG notes that the TCEQ is not bound to apply EPA policies on evaluating BACT. Rather, the EPA granted Texas approval in 1992 to administer the PSD program that is part of the Texas State Implementation Plan (SIP).[40] The Texas Clean Air Act, at TEX. HEALTH & SAFETY CODE § 382.0518(b)(1), contains the requirement for the use of BACT by a to-be-permitted facility. In its reply brief, NRG notes the clear legal history showing that the BACT requirements in a PSD permit in Texas are analyzed pursuant to the state's regulatory requirements, definitions, and interpretations, and not federal standards or EPA's interpretations. Therefore, NRG argues that Protestants' comparison of the TCEQ's three-tier approach to the EPA's top-down BACT analysis is irrelevant, because only the state definitions and regulatory interpretations of BACT are

[38] Sierra Club Ex. 18, at item 1.

[39] Sierra Club Ex. 18, at item 1.

[40] 57 Fed. Reg. 28093 (June 24, 1992).

applicable and any inconsistency in methodology is inconsequential. Further, the role of the EPA is simply to ensure that SIP-approved PSD programs are implemented in such a manner as to satisfy the underlying federal PSD requirements. In a nutshell, this means that Texas is given leeway to implement its own plan (including interpretations, definitions, and methodologies), so long as the result complies with basic federal requirements.

Further, NRG contends that the two different approaches are designed to arrive at the same conclusion. NRG points out that numerous witnesses have agreed that, when applied properly, the TCEQ three-tier approach and the EPA's top-down approach will reach the same results. For example, one of NRG's air experts, William Frazier, Ph.D., P.E., testified that you "get to the same endpoint from an emissions perspective and BACT emissions perspective" regardless of which methodology you use.[41] Similarly, TCEQ permit reviewer James Linville testified that, although the TCEQ BACT analysis and the EPA BACT analysis are not the same, "they both get to the same endpoint."[42] Even Sierra Club's expert witness agreed, stating that either methodology "applied correctly, should produce the same BACT outcome."[43]

Finally, NRG points to recent Commission orders applying the TCEQ's tiered BACT methodology,[44] contending that its use is a matter of settled law in Texas. Since the three-tiered method is the Commission's standard practice and the Commission has approved its use in prior cases, NRG argues that Sierra Club's challenge is merely another "generic attack on longstanding TCEQ guidance and practice regarding BACT review that is in no way unique to this case."[45] As such, NRG argues that the attack on the TCEQ's BACT analysis should be disregarded as without merit, as it has been in other contested cases.

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[41] Tr. at 428.

[42] ED Ex. 1, at 9.

[43] Sierra Club Ex. 15, at 21.

[44] NRG Exs. 84 and 85 (*Oak Grove* and *Sandy Creek* Final Orders).

[45] NRG's Brief in Reply to Closing Arguments, at 4.

Although the ALJs somewhat agree that the EPA's top-down BACT approach may be better designed to be technology-forcing, the ALJs also conclude that the TCEQ's tiered methodology is the proper method for analyzing BACT in this case. Although there may be legitimate concerns with whether the TCEQ's three tier BACT methodology actually ensures the technology-forcing purposes behind the BACT requirement, the methodology has been approved by the Commission in prior cases. Specifically, this same methodology has been used by the TCEQ in evaluating BACT at least since 2001, when the guidance document was issued. The methodology was used in both the *Oak Grove* case and the *Sandy Creek* case, and the Commission's Final Order ratified its use in those cases.

Unless the Commission implements a different methodology or the courts order otherwise, applicants for PSD permits in Texas may use the TCEQ's three-tier methodology as a reliable method for determining BACT. As such, the ALJs agree with NRG's contention that Protestants' challenge is merely a generic attack on the TCEQ's practices and is not specific to the facts of this case. The ALJs see no unique reasons presented in this case for the Commission to reconsider its prior determination to allow the use of the three-tier method for determining BACT. Accordingly, Protestants' challenge to the TCEQ's BACT methodology is without merit.

b. Sufficiency of NRG's Tier I BACT Analysis

Protestants also assert that the BACT analysis in this case does not comply with the TCEQ's tiered methodology. They note that the TCEQ's Tier I review requires a consideration of possible new technological advances that might make additional reductions in emissions technically and economically reasonable. Protestants allege that neither NRG nor the ED conducted "an analysis to determine whether any technological or cost-effectiveness progress has occurred."[46] Rather, instead of researching new technology, the ED's BACT analysis was based simply on a review of other existing permits and what was known to the ED's technical

[46] Sierra Club's Closing Arguments, at 17.

review staff at the time. Protestants argue this does not satisfy even the TCEQ's Tier I analysis, which requires a determination of whether new technical developments have been made.

NRG disputes Protestants' claim that the BACT Analysis in this case simply looked at existing permits and did not consider new technological innovations. NRG cites to the testimony of John Klumpyan, P.E., one of its experts, who testified that there are no new technological developments that would provide the potential for further emission reductions from the BACT limits proposed for Limestone Unit 3. In reaching his opinion, Mr. Klumpyan noted his knowledge of technology in this area:

> I am presently working with several engineering firms and equipment suppliers to evaluate control technologies for implementation at several other NRG facilities. Additionally, I receive and read industry publications such as Power Engineering, Electric Light and Power, and Coal Power, which regularly provide technology updates on existing controls and cover developments for new and emerging technologies. I also routinely participate in industry conferences, such as PowerGen and CoalGen and recently co-authored several papers on emission control technology implementation that were presented at the 2008 PowerGen conference in December.[47]

Further, NRG points out that the ED's technical staff reached the same conclusion—namely that there are no new technological developments that could reduce emissions even further than the BACT limits in the permit. In reaching this conclusion, Mr. Linville testified that the BACT analysis included an evaluation of technological developments, and he stated that the air permits division staff "followed air pollution technology development for coal combustion through attendance at workshops and conferences, interaction with vendor experts, state and federal regulators, plant tours, etc."[48] NRG points out that numerous other witnesses—including Sierra Club's own expert witness—also testified that the suite of controls proposed to be used at Limestone Unit 3 are the top technology available.[49]

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[47] NRG Ex. 24, at 20.

[48] ED Ex. 1, at 10.

[49] *See, e.g.*, NRG Ex. 75, at 135; Tr. at 656-658; NRG Ex. 80, at 82-86.

Based upon the testimony of these witnesses, NRG contends its BACT analysis did include consideration of any new technological developments that might be available. Moreover, because many of the other permits it considered were within the last few years, those permits were based upon newer technologies also. As NRG notes in its reply brief, the BACT analysis is not about forcing new unproven technologies, but rather about determining what is presently achievable under existing and proven technologies. NRG cites a Kentucky court of appeals in stating "BACT 'must be solidly grounded on what is presently known about the selected technology's effectiveness[.]'"[50]

The ALJs conclude that Protestants' challenge is without merit. Although the BACT analysis in this case did start with other existing permits, the evidence also indicates that existing technologies that could reduce emissions were considered and, except as discussed in regard to specific pollutants below, the best available technologies will be used at Limestone Unit 3. Except in isolated instances discussed further below, Protestants did not identify specific new technologies that they contend should be used. Although it is not their burden to do so, the lack of evidence on specific technologies often leaves unchallenged NRG's contention that it generally will use the best available technology for Limestone Unit 3.

NRG's contention is also supported by Protestants' key BACT witness, Dr. Sahu. Among other things, Dr. Sahu conceded that the proposed technologies for Limestone Unit 3 [which include low-NO_x burners, selective catalytic reduction (SCR), wet flue gas desulfurization (wet FGD), and a fabric filter baghouse] have the potential to be the top technologies for controlling NO_x, SO_2, and PM.[51] Further, as part of this permitting process, NRG updated its original BACT analysis that was prepared as part of the application in 2006. Specifically, in 2007, NRG submitted a BACT update review that looked at additional existing permits and re-evaluated the BACT analysis contained in NRG's permit applications. In its

[50] NRG's Brief in Reply to Closing Arguments, at 15. NRG cites the Kentucky Court of Appeals' decision which, in turn, cites an EAB decision, *In re Newmont Nevada Energy Investment, LLC, TS Power Plant,* 12 E.A.D. 429, 441 (EAB 2005).

[51] Tr. at 656-658; NRG Ex. 80, at 82-83.

update, NRG identified its approach to conducting the update, stating the "first step in the assessment of the updated permit data was to determine if any new information has been presented since the preparation of the BACT analysis that would change the selection of control technology for any pollutant."[52] So, NRG did consider new technologies that were being used for emissions control. NRG went on to note that the data did not suggest that a change in the proposed control technology was warranted, except as to "the use of sorbent injection for H_2SO_4 control while co-firing bituminous coal and pet coke. . . ."[53]

NRG's expert witnesses testified that no new technologies exist that would allow additional emissions reductions from Limestone Unit 3, except inasmuch as a reduction in emission of one pollutant would cause an increase in another. Although Protestants have raised some questions about possible new technologies in regard to specific emissions, the ALJs are convinced that overall NRG did consider new technologies in determining the BACT emissions limits proposed for Limestone Unit 3 and, thus, did comply with the requirements of the TCEQ's Tier I analysis. Therefore, the ALJs do not find that NRG's analysis was flawed or inconsistent with the TCEQ's Tier I requirements. This does not mean, however, that the ALJs conclude that there are no new technologies available that might be utilized at Limestone Unit 3. Those issues are addressed separately in regard to specific pollutants below.

c. The Proposed BACT Particulate Matter (PM) Limits

Protestants argue that the evidence demonstrates that the PM emission limits in the proposed permits are not BACT. The PM/PM_{10} permit limits are 0.015 lb/MMBtu for the filterable portion and 0.035 lb/MMBtu for total PM/PM_{10}. However, other permits have had lower limits. In fact, Sierra Club's expert notes, and NRG concedes, that there are at least eight other final permits with lower filterable PM_{10} limits of 0.012 lb/MMBtu.[54] Moreover, there are

[52] NRG Ex. 6, at 594.

[53] NRG Ex. 6, at 594.

[54] Sierra Club Ex. 15, at 50.

numerous other facilities that have total PM limits of 0.02 or 0.018 lb/MMBtu—much less than NRG's proposed 0.035 lb/MMBtu limit for total PM.[55] Further, Protestants have presented data showing many facilities in Florida that, when tested, had total PM emissions of 0.018 or less.[56] Protestants contend that NRG has given no real rationale or justification for why the permit in this case could not have similarly low PM emissions limits.

In response, NRG argues that, because of the case-by-case MACT analysis conducted for Limestone Unit 3, filterable PM will actually be limited to 0.012 lb/MMBtu.[57] This limit is as low as any contained in the other permits cited by Protestants and, according to NRG, represents the maximum achievable limits for filterable PM for a facility such as Limestone Unit 3.[58]

In regard to total PM, NRG acknowledges that the limit of 0.035 lb/MMBtu for total PM/PM_{10} is higher than that existing for some other permitted facilities. However, NRG alleges that, with one exception,[59] those facilities with lower PM limits have not been shown to be in compliance with their permitted limits for total PM. NRG contends that this is because the measurement techniques for condensable PM (which is a portion of total PM) are unreliable. This lack of reliable measurement techniques has led the EPA to grant states the right to not regulate condensable PM while new and more reliable testing methods are developed. However, Texas has not so opted. But, in light of the fact that "the reference test method the EPA has for condensable PM has a known bias and produces inconsistent results," NRG contends this must be accounted for and a compliance margin built in to the BACT limit for total PM.[60]

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[55] Sierra Club Ex. 15, at 51-53.

[56] Sierra Club Ex. 32.

[57] NRG Ex. 49, at 26.

[58] Tr. at 1224-1228.

[59] Tr. at 1229 (citing an Iowa facility that demonstrated compliance through a one-time initial performance test with a limit of 0.025 lb/MMBtu).

[60] Tr. at 1229-1230.

After considering the evidence and arguments on this issue, the ALJs conclude that NRG's proposed filterable PM limit is BACT. As noted by NRG, this limit of 0.012 lb/MMBtu is as low as any contained in the other permits cited by Protestants and appears to represent the best achievable limits for filterable PM for a facility such as Limestone Unit 3.[61]

However, NRG has not demonstrated that its proposed *total* PM/PM_{10} limit is BACT. NRG's expert witnesses concede that there are a number of existing permits that contain more stringent total PM limits. Most are not yet operational, but at least one is.[62] In particular, the Walter Scott unit in Iowa has a permitted total PM limit of 0.025 lb/MMBtu.[63] A stack testing of this unit showed that it was able to comply with the permitted limit, although NRG disputes that it will be able to do so regularly. In fact, that is the essence of NRG's argument against all of the other permitted facilities with lower total PM limits. Basically, because existing methods of measuring PM are unreliable, NRG contends that the lower PM limits in permits will not likely be met.[64] Instead, to account for the "biases" contained in existing measurement methods and to allow for a reasonable compliance margin, a higher total PM limit should be allowed as BACT. On the evidence before them, the ALJs cannot reach such a conclusion.

As NRG notes, the Commission has not chosen to "not regulate" condensable PM while new and more reliable testing methods are developed. Therefore, concerns about potential biases in the measurements are generally not relevant unless they are shown to be a factor in the limits established in other permits. What is clear is that a number of facilities burning PRB sub-bituminous coal have been permitted with lower total PM/PM_{10} limits in recent years and at least one of those has already been built and demonstrated to be in compliance with its permit limits.[65]

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[61] Tr. at 1224-1228.

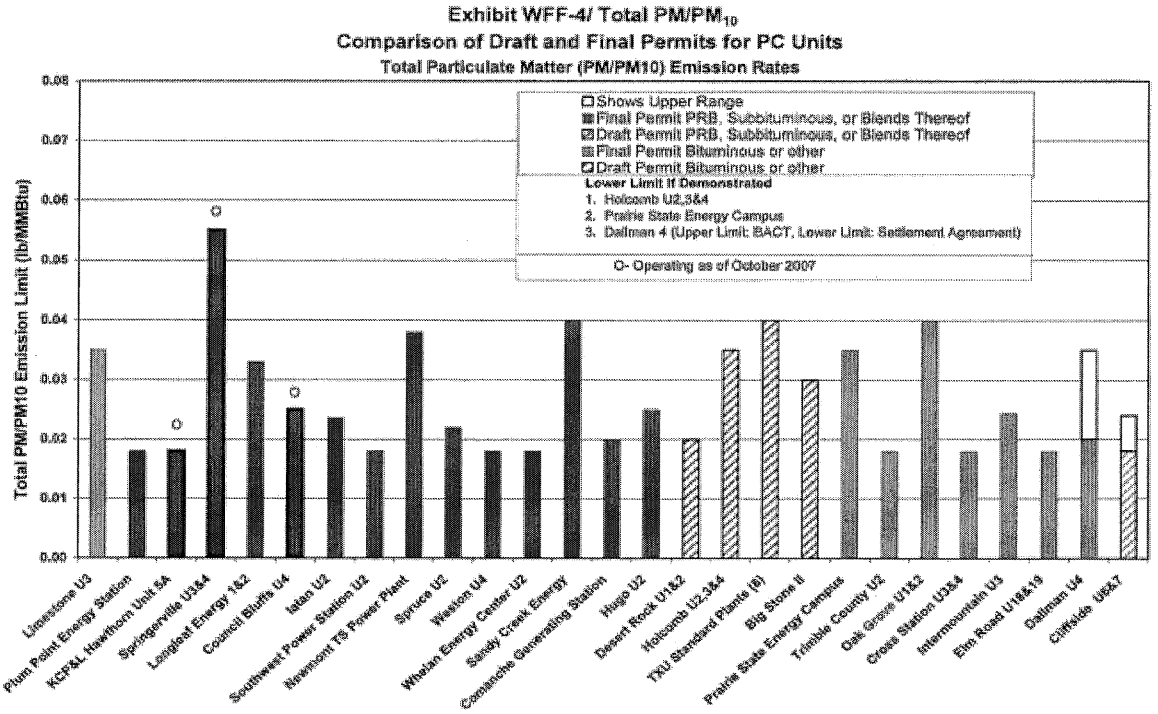
[62] Tr. at 1207.

[63] Tr. at 1208, 1244-1245.

[64] NRG also asserts that these other facilities are distinguishable because of the type of coal they will burn. However, NRG has failed to adequately substantiate this general assertion, and many of the facilities cited by Protestants are permitted for PRB and sub-bituminous coal—similar to Limestone Unit 3.

[65] Sierra Club 15, at 50-53.

In the face of this evidence, NRG has not given a persuasive justification to disregard those other permits. NRG points to other permits when it suits them, but then discounts them when it does not. This is unacceptable unless NRG can persuasively explain why those other permits are distinguishable. NRG has not done that here, giving only cursory explanations and failing to justify its rationale with detailed supporting evidence. In contrast, Sierra Club expert Dr. Sahu was very clear in opining that these other facilities were similar to Limestone Unit 3 and should be seen as comparable facilities. Moreover, he provided extensive evidence that lower total PM emissions have clearly been achievable,[66] and NRG's own evidence shows there are many other facilities that will use "PRB, Subbituminous, or Blends Thereof" that have total PM/PM_{10} limits lower than NRG proposes. The chart below—an NRG exhibit—reflects this. NRG's proposed limit is shown first. Of the 26 other facilities shown, 18 have lower limits:[67]



[66] Sierra Club 15, at 50-54; Sierra Club Ex. 32. NRG points out the great variability in the examples given by Dr. Sahu. While it is true that there is significant variability in the facilities' emissions during different testing periods, the variability does not establish that lower emissions are not achievable. Although the test results chosen by Dr. Sahu are just a sample, they still are all below 0.020 lb/MMBtu (which is well below the standard of 0.035 lb/MMBtu proposed by NRG in this case).

Given this evidence, the ALJs cannot find that the total PM/PM_{10} limit of 0.035 lb/MMBtu is actually BACT. Instead, the ALJs conclude that the evidence suggests that BACT for total PM/PM_{10} is actually 0.025 lb/MMBtu (or possibly lower). Therefore, the ALJs recommend that the limit of 0.025 lb/MMBtu be adopted as BACT for total PM/PM_{10} for Limestone Unit 3. If NRG contends that this is simply unachievable, then the permit may either be denied or remanded for further evidence on the BACT for total PM/PM_{10}.

d. The Proposed BACT SO_2 Limits

In regard to SO_2 emissions, the proposed permits contain two different BACT emission rates: 0.06 lb/MMBtu averaged annually, and 0.10 lb/MMBtu averaged over a 30-day rolling period (excluding start-up, shutdown, and maintenance). Based upon the type of coal most likely to be used, NRG's proposed emissions limits equates to a 95% to 98.4% emissions reduction. Protestants point to data showing that numerous other facilities have achieved higher efficiencies, as high as 99%, even as far back as the 1980s.[68] Therefore, Protestants urge that SO_2 emissions limits should be 0.012 lb/MMBtu for sub-bituminous coals and 0.037 lb/MMBtu for coal and petroleum coke blends, with an averaging period of 24 hours for all SO_2 limits. They argue that this limit, representing a 99% control efficiency, is BACT for SO_2.

In response, NRG asserts that it is not subject to federal PSD requirements for SO_2, because it has committed to no net increase of SO_2 and has made a formal PSD netting demonstration. Therefore, any BACT analysis of SO_2 is simply a requirement of state law review, and NRG contends that recent TCEQ permits are a reliable indicator of BACT under state review. NRG notes that its SO_2 BACT limits are as stringent as any other recently-issued permits in Texas.

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[67] NRG Ex. 53, at 6 (WFF-4).

[68] *See, e.g.*, Sierra Club's Closing Arguments, at 20-21.

NRG disputes that the 99% control efficiency proposed by Protestants is achievable over a continuous long-term period, which is the appropriate analysis for BACT. NRG argues that this is the principal flaw in Protestants' arguments—namely that they rely upon data (whether from vendors or from other facilities' actual performance) showing that lower emissions can be obtained in the short term, but neglect to properly determine whether such low emissions are sustainable over longer periods of time. NRG's witnesses note that BACT limits are intended to be realistically achievable over the life of the facility. In this regard, the BACT limits contained in other permits are more instructive as to what is believed to be the best available limits realistically achievable over the long term.

NRG points out that even Sierra Club's expert witness conceded he was not specifically aware of any other permits that had lower SO_2 emissions limits than that proposed as BACT for the Limestone Unit 3 project.[69] Further, when questioned whether he could identify any facility that had a 99% control efficiency continuously for a two-year period, Dr. Sahu admitted that he could not. At most, he was aware of some plants that were able to maintain that level of emissions control for a period of some months.[70] NRG asserts that maintaining the level of efficiency proposed by Protestants is simply not sustainable over a period of time. Therefore, it is not appropriate to use it as the BACT limitation. Rather, what has been proposed by NRG is allegedly the true BACT limits currently sustainable.

As noted above, the ALJs disagree that NRG's proposed netting demonstration exempts it from federal PSD BACT review for SO_2. But this is not significant because NRG did conduct a full BACT analysis for SO_2, and the ALJs conclude that NRG's proposed SO_2 limits do represent BACT. Although the evidence shows that higher control efficiencies have been obtained over short periods of time, the evidence does not establish that they have been achievable continuously over extended periods of time. There will be fluctuation in emissions and it is not appropriate to set the BACT limit at essentially the highest control level recorded

[69] Tr. at 674-679.

[70] Tr. at 678-679.

with no margin of fluctuation or error over time. There is no evidence of similar facilities meeting the 99% control efficiency on a permanent basis, and NRG's proposed control efficiency of between 95% and 98.4% (depending on the fuel) represents realistically achievable limits over a continuous long term. Accordingly, the ALJs find Protestants' challenges to the proposed SO_2 limits to be without merit.

e. The Proposed BACT NO_x Limits

Protestants contend that the proposed NO_x limits of 0.05 lb/MMBtu (annual average) and 0.07 lb/MMBtu (30-day rolling average) represent only a 75% removal efficiency, which is much less than the existing BACT of 90% removal efficiency at many other similar facilities.[71] Protestants argue that NRG's proposed control technologies are capable of achieving the 90% removal efficiency, but NRG has unjustifiably included a "cushion" in its proposed NO_x emission limits. Protestants present a NO_x emission limit of 0.020 lb/MMBtu as BACT, which is allegedly readily achievable by either (1) reducing emissions from the boiler to 0.20 lb/MMBtu (as envisioned by NRG) and ensuring a 90% removal efficiency post boiler through the selective catalyst reduction (SCR); or (2) reducing the emissions from the boiler to below 0.20 lb/MMBtu (by in-boiler controls) and having less than a 90% removal efficiency at the SCR (i.e., post-boiler). Protestants contend that this can be met on a 30-day rolling average and, thus, no separate annual average limit is needed.

As with SO_2, NRG has committed to no net increase of NO_x and alleges it has made a formal PSD netting demonstration, thus making any BACT analysis of NO_x simply a requirement of the state air quality permit. Also as with SO_2, NRG criticizes Protestants' proposed BACT limits for NO_x as being unachievable in real life over a continuous period of time. NRG points out that Sierra Club's expert witness could not identify any plant with a lower numerical emissions limitation for NO_x than that proposed for Limestone Unit 3.[72] Nor could

[71] Sierra Club Ex. 15, at 47-48.

[72] Tr. at 681-688; NRG Ex. 80, at 166-184.

Dr. Sahu identify any plant that has operated for more than a year at any level similar to that proposed by Protestants.[73] In fact, as NRG notes in its brief, numerous witnesses have testified that the NO_x emission control rates proposed by Protestants are achievable only over short periods of time or in a hypothetical mathematical exercise, but have not been demonstrated as achievable in actual performance, when accounting for known variables such as ash deposition and catalyst plugging.

In support of its position, NRG cites to the testimony of its expert witnesses and the ED's expert witness. In regard to Protestants' proposed NO_x emission limit, NRG witness Colin Campbell testified:

> I do not think it is achievable. I'm not aware of any operating coal-fired power plant that is achieving sustained operation at rates even approaching as low as .02 pounds per million Btu heat input. And to the extent that one can arrive at that limit through a mathematical exercise, evaluating what is achievable through a highly-performing boiler and then applying some hypothetical control efficiency for an SCR system. I don't think that's appropriate as a way to establish — for the agency to establish a BACT emission limit.
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> * * *
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> From an engineering and chemistry standpoint, the application of a hypothetical control efficiency for what a control device might be designed to achieve in some installations, and the application of that control efficiency to an instance like this where the NO_x level coming out of the boiler is relatively low already, these are rate-limited reactions and the rate-limited chemical reactions and the same control efficiency is not achievable across the board at all inlet concentrations.[74]

Further, the ED's staff expert testified that "to pick a number like the 90 percent removal on an SCR and say that can be done across the board in every case is, I think, a little bit—going beyond what I would accept to be achievable."[75] Moreover, in response to public comments, the

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[73] Tr. at 681-688; NRG Ex. 80, at 166-184.

[74] Tr. at 1222-1223.

[75] Tr. at 897.

ED stated that the "BACT proposed by Sierra Club, based on a 90 percent reduction in the SCR, reflects data that has been achieved but not demonstrated over the life of the catalyst and does not account for known problems with ash deposition and catalyst plugging, and has not been required in any existing permits."[76]

Therefore, NRG contends that Protestants' proposed BACT limits are not realistic and should not be adopted. Rather, NRG argues that the BACT limits proposed by it are the most stringent of any permit in existence, represent the realistic actual emissions under BACT, and should be adopted.

As with SO_2, the ALJs disagree with NRG's contention that its netting demonstration exempts it from federal PSD BACT requirements. But, also as with SO_2, this is not decisive because NRG has presented a full BACT analysis for NO_x. And, after reviewing the evidence presented, the ALJs conclude that although Protestants have raised some legitimate concerns, those concerns do not rise to the level of indicating that NRG has not satisfied its BACT analysis for this pollutant.

First, Protestants raise a legitimate question as to whether a 90% control efficiency in the SCR is achievable for Limestone Unit 3 and should be utilized and result in a reduction to the NO_x BACT limits. The evidence shows that at least 30 different facilities have been able to obtain a 90% control efficiency for months at a time, and the EPA's acid rain database indicates that "90% removal efficiency was currently being achieved by a significant portion of the coal-fired SCR fleet . . ."[77] Therefore, this evidence at least raises a legitimate question as to whether a 90% NO_x reduction should be considered BACT and expected in this case.

NRG's response is relatively brief—basically indicating that such a reduction is simply unachievable on a long-term basis. Essentially, NRG's response boils down to this: although it

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[76] NRG Ex. 12, at 27.

[77] Sierra Club Ex. 15, at 48.

has been done (in fact by many facilities) on a short term basis, it is not sustainable over the long term for any facilities because of concerns such as ash deposit and catalyst plugging, or other technical concerns. However, NRG's evidence on this is very slim and does little to fully explain the technical difficulties associated with maintaining a 90% reduction in the SCR over longer periods. Thus, to some degree, NRG asks the Commission to just accept its expert conclusion, with little technical justification.

But, despite the slim explanation for NRG's position, it is supported by the fact that those facilities identified as having a 90% reduction for periods of time have not been shown to have maintained it for extended periods, including a year or longer. Thus, while NRG's explanation is somewhat sparse, it is consistent with the evidence from other facilities. And, although Sierra Club expert Dr. Sahu has opined that there is no technical reason why a 90% reduction is not obtainable (and he has offered ways to mitigate the technical concerns raised by NRG's witnesses),[78] neither Protestants nor their experts have identified facilities that have achieved such reductions for extended periods of time or that have permit limits as low as they are recommending in this case. Moreover, the proposed annual NO_x emissions limits for Limestone Unit 3 are consistent with those proposed for other similar, recently-permitted facilities. Therefore, this also supports NRG's contention that the limits it is proposing are consistent with BACT. Accordingly, the ALJs find that NRG's evidence—though not fully refuting all concerns raised—is sufficient to meet its burden of proof that the annual NO_x limits proposed by it represent BACT.

The other primary concern raised by the evidence in regard to NO_x relates to NRG's proposed short-term BACT limit. NRG proposes a short-term BACT limit of 0.07 lb/MMBtu (30-day rolling average). The evidence reflects at least six facilities with lower short-term BACT limits for NO_x, ranging between 0.05 lb/MMBtu and 0.069 lb/MMBtu.[79] Four of these use PRB, sub-bituminous, or blends (Spruce Unit 2, Weston Unit 4, Newmont TS Power, and

[78] Sierra Club Ex. 15, at 48-49.

[79] NRG Ex. 53, at 2 (exhibit WFF-1b); NRG Ex. 49, at 24-25.

Desert Rock), while two use bituminous (Trimble County Unit 2 and Dallman Unit 4). In reviewing the draft permit in this case, the EPA acknowledged recently-permitted facilities with lower short-term NO_x limits and stated that it "recommends that TCEQ consider if a lower short-term NO_x limit for BACT is feasible . . . . If a lower 24-hour and/or 30-day NO_x emission rate is technically feasible for BACT, then an analysis should be provided to explain why a lower rate is not proposed for the short-term NO_x BACT limit."[80]

In the face of this evidence, NRG's expert witness responded by conceding that some other facilities have lower short-term NO_x limits but noting their annual limits were higher than proposed here.[81] But, other than explaining that Limestone Unit 3's *annual* NO_x emissions limit is more favorable than those facilities having a lower short-term emissions limit, NRG has done little to explain why it could not (and should not be required to) achieve a lower short-term limit. In fact, it basically concedes that it can achieve such lower limits on a relatively long-term basis, because it will have to do so to offset any higher short-term emissions that are near the proposed 0.07 lb/MMBtu limit. Specifically, Dr. Frazier testified:

> The more restrictive annual NOx emission rate of 0.05 lb/MMBtu for Limestone Unit 3 will require the detail design of the low NO_x combustion system and SCR to be capable of limiting NO_x emissions below 0.05 lb/MMBtu. Any operating periods, with NO_x emission rates equivalent to the short-term NOx emission rate of 0.07 lb/MMBtu, will need to be offset by operating periods with NOx emission rates less than 0.05 lb/MMBtu, in order to comply with the 12 month rolling average emission rate limit (0.05 lb/MMBtu).[82]

Dr. Frazier then goes on to demonstrate how Limestone Unit 3 would have to operate for 10 months with a NO_x emission rate of 0.046 lb/MMBtu to offset two months of operating at 0.07 lb/MMBtu.[83] Thus, NRG concedes that it is feasible to operate under a lower short-term NOx limit (for 10 months out of a 12-month period in Dr. Frazier's example). And, NRG fails to

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[80] NRG Ex. 73, at attached exhibit 8, comment 2.

[81] NRG Ex. 49, at 24-25.

[82] NRG Ex. 49, at 25.

[83] NRG Ex. 49, at 25.

justify why it is necessary to have a higher short-term limit for Limestone Unit 3. There may be any number of valid reasons, but NRG has failed to explain and justify the higher short-term rate. Merely noting that its annual average is lower than other facilities having lower short-term emissions rates does not address the issue of why NRG should not be required to have a lower short-term limit itself.

However, it is important to note that NRG has agreed to no net increases in NO_x emissions overall and, specifically, has agreed to a permit requirement that it must not have any net increase in NO_x emissions on a 30-day rolling average. Such a permit requirement generally ensures no degradation of air quality or increased threat to human health from NO_x emissions from NRG's combined facilities at the Limestone station—at least in regard to the 30-day averaging period, which is what the short-term limit is based upon. Although this does not address the question of whether NRG's proposed short-term emission limits are BACT, it does address the concerns underlying BACT. In regard to the Commission's precedential determination as to BACT for short-term NO_x emissions, the ALJs recommend the Commission simply lower the short-term (30-day rolling average) permit limit for NO_x to 0.06 lb/MMBtu to make it consistent with other recent permits using PRB, sub-bituminous, or blends thereof. This would appear to be BACT based upon the evidence in the record.

f. The Proposed BACT CO Limits

NRG's proposed CO limit is 0.15 lb/MMBtu (30-day average). Protestants cite to other existing permits with lower CO limits as evidence that NRG's proposed limit is not BACT. For example, Protestants cite to three recent permits with CO limits of 0.12 lb/MMBtu or less (using either a 30-day rolling average, a 24-hour block average, or a 24-hour rolling average).[84] Protestants disagree with NRG's explanation that reducing CO emission levels will increase NO_x emission levels. Sierra Club's expert witness testified that technologies exist—such as the DRB-4Z low NO_x burners developed by Babcock and Wilcox—that have been shown effective at

[84] Sierra Club Ex. 15, at 63-64.

providing both low NO_x and low CO emissions.[85] Given this evidence, Protestants contend that NRG's proposed higher CO limits are not justified and are not BACT, and lower limits can be achieved with existing control technology, without adversely affecting NO_x emissions.

NRG disagrees that BACT would enable lower CO emissions limits than it proposes. Although conceding there are other facilities with lower permit limits for CO, NRG asserts that those facilities do not have as stringent of NO_x limits as those proposed in this case. NRG contends that there is an inverse relationship between NO_x and CO from most sources. As NRG witness Colin Campbell testified, "very low CO levels can be achieved by facilities that do not perform as well with respect to NO_x emissions, and vice versa," and "an agency cannot set limits for both CO and NO_x at the level—at the lowest levels achievable without consideration of the fact that they're not achievable simultaneously."[86] Mr. Campbell also was very direct in disagreeing with Protestants' assertion that burners exist under current technology that do not require a trade-off between CO emissions and NO_x emissions. Specifically, Mr. Campbell stated, "It is my testimony that there are no burners in which NO_x performance and CO performances are not in fact inversely related."[87] In light of the inverse relationship between CO and NO_x, NRG argues that its proposed CO emissions limits are, in fact, BACT when considered together with the NO_x limits.

After considering the evidence and arguments, the ALJs find that NRG has failed to show that its proposed limit of 0.15 lb/MMBtu (30-day average) is BACT for CO emissions. NRG's justification for this higher limit, in the face of numerous other facilities with limits of 0.12 lb/MMBtu or less, is simply that lower limits are achieved only through a trade-off of higher NO_x emissions. However, NRG has not refuted evidence indicating this may no longer be true.

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[85] Sierra Club Ex. 15, at 62.

[86] Tr. at 1247-1248.

[87] Tr. at 1250.

In his testimony, Dr. Sahu identified different companies—including Babcock and Wilcox, and Foster and Wheeler—that have developed burners that can achieve low NO_x and low CO emissions at the same time. The DRB-4Z low NO_x burners used at Wygen Unit 1 have been shown through testing to achieve low NO_x and CO values. Although Wygen Unit 1 uses PRB, a Foster and Wheeler paper details how low NO_x and CO emissions can be achieved simultaneously using other fuels as well.[88] The Foster and Wheeler paper gives case studies reflecting simultaneous reductions in NO_x and CO emissions, and concludes that ultra low NO_x emissions with consistent ultra low CO levels can be achieved with coal and airflow measurement and control.[89] NRG has not addressed the contentions raised by this evidence, nor explained why the technology discussed in the Foster Wheeler paper is not viable for Limestone Unit 3 or would not result in lower emissions of CO, without requiring higher NO_x emissions.

Given that there currently are permits with CO limits lower than those proposed by NRG in this case, and the evidence shows that technology may exist that does not require a trade-off in NO_x and CO emissions, NRG's justification for why it cannot have a lower CO limit simply lacks persuasive value. At a minimum, NRG should have shown why the technology identified by Protestants will not allow lower limits of NO_x and CO at the same time, or had not been shown to achieve this consistently over time. NRG did neither, choosing to not address this technology in detail at all.

Therefore, absent additional justification from NRG, the ALJs cannot conclude that 0.15 lb/MMBtu represents BACT for CO emissions. Rather, it appears that 0.12 lb/MMBtu more likely represents BACT.[90] Accordingly, the ALJs recommend that the limit of 0.12 lb/MMBtu be adopted as BACT for CO or, if NRG contends that this is simply unachievable, the ALJs recommend the permit either be denied or remanded for further evidence on the BACT for CO.

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[88] Sierra Club Ex. 15, at 63; Sierra Club Ex. 35.

[89] Sierra Club Ex. 35, at 16.

[90] Sierra Club Ex. 15, at 63-64.

g. Greenhouse Gases and $PM_{2.5}$

Protestants argue that NRG's BACT analysis fails because it does not account for greenhouse gases or $PM_{2.5}$. Protestants assert that greenhouse gases are pollutants for which BACT limits must be established. More specifically, Protestants focus on carbon dioxide (CO_2), arguing that recent court and EAB decisions have made clear that greenhouse gases such as CO_2 must be regulated as air pollutants and, thus, BACT limits must be established. However, neither NRG nor the ED conducted a BACT review nor established BACT limits for CO_2. Therefore, Protestants argue the BACT requirements have not been met.

Further, Protestants take issue with the decision by NRG and the ED to use PM_{10} as a surrogate for $PM_{2.5}$ in evaluating emissions and demonstrating compliance with applicable emissions limits. The Protestants point out that $PM_{2.5}$ limits have been in place since 1997, when the EPA established NAAQS for $PM_{2.5}$. Protestants assert that recent statements by the EPA reflect that past practical difficulties for measuring $PM_{2.5}$ have been resolved. Therefore, Protestants argue that there is no justification for the continued use of PM_{10} as a surrogate for $PM_{2.5}$. Moreover, they note that condensable PM comprises a much larger portion of $PM_{2.5}$ than it does PM_{10}, and the best controls for PM_{10} are not necessarily the best controls for $PM_{2.5}$. Therefore, even where PM_{10} is properly controlled, Protestants allege that substantial harm to human health may still occur as a result of remaining $PM_{2.5}$.

NRG relies on past Commission precedent for its assertion that no separate BACT analysis is needed for either greenhouse gases or $PM_{2.5}$. In regard to $PM_{2.5}$, NRG cites to the Commission's Final Orders in the recent *Oak Grove* and *Sandy Creek* permitting cases as authority for its contention that PM_{10} may be used as a surrogate for $PM_{2.5}$ in air quality analyses.[91] In both of those cases, the Commission noted that "a demonstration of compliance with the PM_{10} NAAQS suffices to demonstrate compliance with the $PM_{2.5}$ NAAQS."[92] Further,

[91] NRG Ex. 84 (*Oak Grove* Final order); NRG Ex. 85 (*Sandy Creek* Final Order).

[92] NRG Ex. 84, at 39; NRG Ex. 85, at 43.

TCEQ air modeling guidelines direct permit applicants to use PM_{10} as a surrogate for demonstrating compliance with the $PM_{2.5}$ NAAQS.[93]

NRG also points to the EPA's $PM_{2.5}$ implementation rule from May 2008. In that rule, the EPA provided for the transition from a PM_{10} surrogate standard to an actual $PM_{2.5}$ standard—both in states with delegated authority to implement EPA PSD rules and in states with their own SIP-approved PSD programs. For states with delegated authority, the EPA indicated that completed applications submitted prior to July 15, 2008, could be considered under the PM_{10} surrogate standard.[94] In contrast, states with SIP-approved PSD programs were given three years to submit revised programs for implementing the EPA's $PM_{2.5}$ standards and move away from the PM_{10} surrogate policy.[95] Thus, NRG contends that, under any legal requirement set out by the EPA's rule, the PM_{10} surrogate standard it used is proper—both because Texas has a SIP-approved PSD program (and thus is given three years to move away from the surrogate policy) and also because NRG's application was submitted approximately two years prior to July 2008.

In regard to greenhouse gases (and specifically CO_2), NRG notes that CO_2 is not subject to regulation under existing Texas law or the federal Clean Air Act. NRG cites the EPA's own statements to this effect, along with recent EAB decisions.[96] Further, the Commission has consistently declined to regulate CO_2 on an *ad hoc* basis when the issue has been raised in prior permitting cases,[97] and it declined to regulate CO_2 as a greenhouse gas in 2000.[98] Therefore, NRG asserts it is under no obligation to conduct a BACT analysis regarding CO_2.

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[93] NRG Ex. 37, at 17.

[94] NRG Ex. 46, at 28,340.

[95] NRG Ex. 46, at 28,341.

[96] *See, e.g.*, 73 Fed. Reg. 44397-44400 (July 30, 2008); *In the Matter of Deseret Power Electric Coop.*, EAB App. No. PSD-07-03 (Nov. 13, 2008).

[97] NRG Ex. 85, at 36.

[98] NRG Ex. 12, at 33.

At the hearing, the ALJs excluded evidence regarding CO_2 and greenhouse gases on the basis that such evidence was not relevant to the issues to be addressed in this case. The ALJs continue to stand by that position, because past federal and Commission precedent has made it clear that CO_2 (and greenhouse gases not specifically identified as required for PSD BACT review) are not currently regulated under state law or the federal Clean Air Act.

However, the ALJs acknowledge that the United State Supreme Court has concluded that certain greenhouse gases, including CO_2, are air pollutants under the federal Clean Air Act.[99] Based upon that conclusion, the Supreme Court directed the EPA to determine whether such pollutants endanger public health or welfare. The EPA is currently in the process of complying with the Court's directive. However, no analysis has been conducted nor have any emissions standards or limits been identified for these pollutants. As such, there has not even been a determination that these pollutants must be specifically regulated, nor the form such regulation might take. There certainly has been no determination that a BACT analysis is needed for these pollutants. Given the current uncertain state of the law and regulation of these pollutants, the ALJs find no basis for concluding that NRG's application, which was submitted approximately two years ago (and before the Supreme Court's determination), is deficient or must include a BACT analysis for CO_2 or other greenhouse gases.

Similarly, both federal precedent and Commission precedent establish that using PM_{10} as a surrogate for $PM_{2.5}$ is the accepted practice in air permitting cases when evaluating emissions and emissions limits under applicable state and federal standards. The Commission has reaffirmed the principle numerous times—in cases involving electric generation units and other types of air permitting cases.[100] Moreover, the principle has been accepted and affirmed by the EAB.[101] Although the EPA is currently in the process of developing separate implementation standards for regulating $PM_{2.5}$, there is no current requirement in place for a separate analysis of

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[99] *Massachusetts v. EPA*, 549 U.S. 497, 510 (2007).

[100] NRG Ex. 84, at 39 (*Oak Grove* Final order); NRG Ex. 85, at 43 (*Sandy Creek* Final Order).

[101] *In re Northern Michigan University Ripley Heating Plant*, PSD Appeal No. 08-02, slip op. at 31 (EAB Feb. 19, 2009).

$PM_{2.5}$ in Texas. And, as NRG notes, states like Texas have until 2011 to develop implementation standards for regulating $PM_{2.5}$ emissions. Until that time, though, the law is clear that PM_{10} is properly used as a surrogate for $PM_{2.5}$ emissions.

h. Sulfuric Acid (H_2SO_4) Mist

NRG proposes a BACT permit limit of 0.0075 lb/MMBtu for H_2SO_4. Protestants agree that sulfuric acid mist is likely to be produced by the boiler and, to properly calculate and control it, the design of the SCR and scrubber must be known (as well as any additional controls that may be used). Protestants note the design specifications for the SCR were not included in the application, nor was the type of sorbent injection that might be used. Protestants allege that emission of sulfuric acid mist is dependent on the conversion rate from SO_2 to SO_3, which depends on the boiler design and the SCR catalyst. Without knowing the SCR design, Protestants claim NRG's proposed BACT limits for H_2SO_4 are unsupportable.

NRG has not specifically responded to Protestants' challenge on this issue, other than simply to note that its proposed BACT limit for H_2SO_4 is the best achievable for a facility using its intended fuel blends. NRG identifies three other facilities in Texas, which it contends are similar to Limestone Unit 3, that have the same or higher H_2SO_4 permit limits than proposed in this case (the Elm Road, Longview, and Oak Grove units).[102] NRG's experts explained why other control technologies (such as a wet ESP) are not suitable for the Limestone Unit 3 facility and why the proposed technologies and emissions limits are the best achievable with the fuel blend used.[103]

Ultimately, the Commission's determination on this issue hinges upon the Commission's belief as to the level of specificity an applicant is required to show to support its BACT analysis. In this case, NRG provides persuasive evidence indicating that the BACT limit it proposes for

[102] NRG Ex. 49, at 29.

[103] *See, e.g.*, Tr. at 422-425.

H_2SO_4 is consistent with the industry standard for the fuel blend it intends to use. However, other than indicating it will use alkali injection, NRG has not identified with greater specificity the design criteria it will use to control such emissions (this is true somewhat in regard to H_2SO_4, and it is definitely true in regard to mercury, as discussed later in the PFD).[104]

Therefore, a concern exists that NRG will not actually be able to meet the BACT permit conditions for H_2SO_4 or that specific design parameters for a given technology might be able to achieve a greater control efficiency. To the extent this potential concern gives the Commission pause, it certainly would be appropriate to require a greater demonstration from NRG in this case, so as to actually address and refute the concerns raised by Protestants. If, however, the Commission believes that the concerns raised by Protestants are addressed by a showing that the BACT limits are consistent with other recently-issued permits using a similar fuel blend and the limits appear to be generally achievable, then it can rely on that in concluding the proposed permit limits are BACT.

Although not directly on point, the Commission's decision in the *Oak Grove* case is somewhat instructive. There, the ALJs concluded that the applicant had not demonstrated that the technology it had selected would be able to meet the emissions limits proposed for the facility and represented the best available control technology. The Commission disagreed, and stated that "[T]he agency's BACT guidance, practice and rules do not require the degree of certainty of success required by the ALJs in this case. Only a reasonable expectation that the technology will work is required."[105] Under that standard, it appears that NRG's proposed technology is the best available and is reasonably expected to allow the emissions limit proposed by NRG in regard to H_2SO_4. And, according to the *Oak Grove* case, any possible inability to satisfy that limit can be considered a question of enforcement.

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[104] Tr. at 424.

[105] NRG Ex. 84, at 45.

i. Lead

NRG proposes permit limits for lead concentration in the coal, with limits being 9 ppm annual average and 86.18 ppm maximum. Protestants point out that these limits are based upon the lead content in bituminous coals alone. In contrast, the average and maximum lead content in sub-bituminous coals (those allegedly most likely to be used) are 4.07 ppm and 33.85 ppm, respectively; similarly, for petroleum coke, the average and maximum lead content are 5.60 ppm and 16.96 ppm, respectively.[106] Thus, as Protestants note, the permit limit is based upon the coal with the highest lead content—even though there is no situation where that coal will be used at all times at Limestone Unit 3. Protestants argue that different limits should be set based upon the type of coal to be used.

In its briefing, NRG has not directly responded to Protestants' contention that different limits for lead should apply to different fuel sources. However, the ALJs generally do not find fault with NRG's approach to setting the permit limits to match the highest limits expected with any given fuel source. Although different fuel sources will have lower associated lead concentrations, the ALJs see no reason why permit limits based upon the most potentially polluting fuel source to be used is unacceptable.[107] Therefore, the ALJs do not recommend making any changes to the permit limits regarding lead.

j. Cleaner Fuels

Protestants argue that NRG has not properly considered the use of cleaner fuels as a method of achieving BACT emissions. Protestants note that the federal Clean Air Act includes

[106] NRG Ex. 6, at 000563-000564.

[107] The ALJs recognize that one might argue it is inconsistent to focus on emissions limits using sub-bituminous coals for some pollutants, and then to focus on limits based upon burning bituminous coals for other potential pollutants (such as lead). However, because the issue is "maximum allowable limits," the ALJs believe that it is always necessary to focus on the most potentially polluting fuel to be used when evaluating any particular emission limit. Thus, there is no inconsistency in the ALJs' determination to focus on sub-bituminous coals in some instances and bituminous coals in other instances, because NRG will have authority to burn both.

"clean fuels" as a consideration in the BACT analysis, citing 42 U.S.C. § 7479(3) and 40 C.F.R. § 52.21(b)(12). Moreover, Protestants point out that the requirement to consider clean fuels was recently upheld by the EAB, which stated:

> In its brief list of BACT production processes, methods, systems, and techniques, Congress sounds one prominent note: fuels. CAA § 169(3), 42 U.S.C. § 7479(3). In addition to "fuel cleaning" and "treatment or innovative fuel combustion techniques," the remaining listed control is "clean fuels." *Id.* Congressional direction to permitting applicants and public officials is emphatic. In making BACT determinations, they are to give prominent consideration to fuels.[108]

Therefore, Protestants assert that NRG was required to consider cleaner fuels as part of its BACT analysis. Because it did not, Protestants allege its BACT analysis fails.

In response, NRG focuses its arguments on SO_2 emissions because that is the example used by Sierra Club in its closing arguments regarding cleaner fuels. NRG relies on its PSD netting demonstration and asserts that because there will be no net increase in SO_2 or NO_x, it is not required to comply with federal PSD requirements for these pollutants and EAB precedent is not applicable. Further, NRG presented evidence showing that the use of other fuel sources would not affect its SO_2 emissions. Finally, and most importantly, NRG cited to evidence indicating that the proposed fuel mix for Limestone Unit 3 dictated certain aspects of the boiler design. Therefore, a change in the fuel source likely would result in a change in the facility design and, essentially, result in a redefining of the entire project.[109] NRG argues that steps requiring a change in a facility's design are not required as part of a BACT analysis. Therefore, because consideration of other fuel sources could impact the design of the project and change its nature and purposes, NRG contends it was not required to consider cleaner fuels as part of its BACT analysis in this case.

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[108] *In re Northern Michigan University Ripley Heating Plant*, Slip Op. at 17-18 (EAB Feb. 18, 2009).

[109] NRG Ex. 49, at 21-22.

Ultimately, the ALJs agree with NRG that requiring consideration of different fuels would change the nature of the project. As Dr. Frazier testified:

> Requiring NRG to utilize only certain fuel supplies would redefine the project. The mix of fuels proposed for Limestone Unit 3 is based upon business decisions and NRG's views on future coal markets. Eliminating the blended fuel options would redefine the basis for the Limestone Unit 3 project.

In past cases, the Commission has made clear that an applicant is not required to consider and adopt measures that change the very nature of the project. For example, in the *Oak Grove* and *Sandy Creek* cases, the Commission determined that applicants intending to use pulverized coal or lignite-fired boilers were not required to consider other electric generation technologies, such as integrated gasification/combined cycle technology, in their BACT analyses.[110] In the same way, the ALJs do not believe that an applicant is required to consider different fuels or fuel blends, when the use of those fuels or fuel blends would change the nature of the project and its economic viability. Therefore, the ALJs find that NRG was not required to evaluate cleaner fuels as part of its BACT analysis, and its failure to do so is not a flaw in its BACT analysis.

4. BACT Summary

In summary, although Protestants raise some legitimate concerns regarding NRG's BACT analysis, the ALJs conclude that past Commission determinations resolve those concerns and support the conclusion that NRG's BACT analysis satisfies the applicable requirements in statute and rule. Moreover, the ALJs find that the preponderance of the evidence indicates the proposed BACT limits in the permits, as modified by the recommendations in this PFD, reflect the most stringent emissions that can be continuously achieved by the best available technology currently existing. Therefore, the ALJs find that NRG's BACT analysis and BACT limits are sufficient, as modified herein, and do not justify denial of the requested permits.

C. Air Quality Modeling Issues

1. Air Modeling Overview

Under Texas statutes and rules, NRG is required to demonstrate that the expected emissions from Limestone Unit 3 will not contravene the intent of the Texas Clean Air Act, including the protection of public health, public welfare, and physical property.[111] To satisfy these requirements, NRG conducted air dispersion modeling to demonstrate the anticipated air quality effects of Limestone Unit 3. NRG's modeling was conducted to show, among other things, (1) predicted concentrations of criteria pollutants compared to the NAAQS; (2) predicted concentrations of criteria pollutants compared to the PSD increment standards, in consideration of the applicable PSD "significance" thresholds; (3) predicted concentrations of applicable pollutants compared to the state property-line standards; and (4) predicted concentrations of pollutants not subject to NAAQS or state property-line standards for purposes of a state effects review.[112]

NRG's modeling demonstrated that there would be no harm to public health, public welfare, or physical property, as addressed by the various state and federal standards (such as NAAQS, PSD increment standards, state property line standards, *etc.*). However, Protestants have raised numerous challenges to the reliability and sufficiency of NRG's air quality modeling, and these challenges are addressed below.

2. Should Modeling Receptors have been Located on the Limestone Station Property?

A crucial aspect of modeling is the selection of modeling receptors for measuring the effects of the regulated activity. As indicated previously, NRG's Limestone Station property

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[110] NRG Ex. 84, at 41 (COL 25); NRG Ex. 85, at 42 (COL 25).

[111] TEX. HEALTH & SAFETY CODE § 382.0518(b); 30 TEX. ADMIN. CODE § 116.111(a)(2)(A)(i).

[112] NRG Ex. 35, at 12-13.

includes two present electric generating facilities and a solid waste disposal facility. Protestant Valence does not own or lease any surface estate within the Limestone Station property, but it is the operator of gas wells on the property and is legally permitted to have access to portions of the surface property as necessary to conduct its operations.[113] Under existing legal precedent, these operations may include exploring for, drilling, and servicing gas wells on the surface property where Valence leases the underlying mineral interests.[114]

Valence's presence on the property raises an issue as to whether NRG's modeling was conducted in accordance with applicable statutory and regulatory requirements and is protective of the public, given that no modeling receptors were considered within Limestone Station, where Valence's employees and contractors work daily. The regulatory requirements for determining where modeling receptors should be located generally concern two aspects: (1) modeling for the State effects review and (2) modeling for the NAAQS and PSD Increment.

a. State Effects Review Requirements

Modeling requirements for the State Effects Review are quite clear. Relevant portions of the Texas Clean Air Act and Commission rules require an applicant to demonstrate that its emissions will be protective of the *public's* health, general welfare, and physical property.[115] This generally excludes from consideration the applicant's property, because the Commission regulates only "ambient air"—that part of the atmosphere to which the general public has access.[116] The Commission's *Air Quality Modeling Guidelines* put this into practice by requiring no receptors on an applicant's property when the impacts are modeled. These guidelines explain that, because the air over an applicant's property is not ambient in a regulatory sense, applicants

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[113] Tr. at 850. The surface estate is subject to an implied easement in favor of the dominant mineral interests. *Acker v. Guinn*, 464 S.W. 2d 348, 352 (Tex. 1971).

[114] *Ball v. Dillard*, 602 S.W. 2d 521, 523 (Tex. 1980).

[115] TEX. HEALTH & SAFETY CODE ANN. §§ 382.002 and 382.0518(b)(2); 30 TEX. ADMIN CODE §§ 101 and 116.111(a)(2)(A)(i). (Emphasis added).

[116] 30 TEX. ADMIN. CODE §§ 101.1(4) and (83).

cannot cause a condition of air pollution on their own property from their own sources.[117] The Commission's Modeling and Effects Review Applicability (MERA) guidance also emphasizes that, for modeling purposes, ambient air starts at the property line.[118] In MERA, a "receptor" is discussed as the "location where the public could be exposed to an air constituent in the ambient air."[119]

Given these regulations and Commission guidance, the sole issue concerning the State Effects Review is whether Valences' ownership of the minerals under, and related access to, NRG's surface property undermine NRG's claim that it is the sole owner of the Limestone Station property in accordance with 30 TEX. ADMIN. CODE §101.1(83), where "property" is defined as "[A]ll land under common control or ownership coupled with all improvements on such land, and all fixed or movable objects on such land, or any vessel on the water of this state."[120]

b. NAAQS and PSD Increment Modeling Requirements

Evaluation of NRG's NAAQS and PSD Increment Review is slightly more complex. In addition to the "bright line" property line rule of the State Effects Review, EPA guidance adds the requirement of a "physical barrier" when determining the property line. The federal regulations define ambient air as "that portion of the atmosphere, external to buildings, to which the general public has access."[121] This is similar to the state definition. But EPA's longstanding policy has been that "access" (within that definition) is determined by whether *public access is*

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[117] NRG Ex. 37; TCEQ Air Quality Modeling Guidelines at 48.

[118] NRG Ex. 43. Modeling and Effects Review Applicability: How to Determine the Scope of Modeling and Effects Review for Air Permits (MERA)(2008).

[119] NRG Ex. 43, at 21.

[120] 30 TEX. ADMIN. CODE § 101.1(83).

[121] 40 C.F.R. § 50.1(e).

precluded by a fence or other physical barrier to the land owned or controlled by the source.[122] The Commission has recognized this additional EPA requirement in the State's *Air Quality Modeling Guidelines*, where ambient air for PSD modeling is said to start at the applicant's fence line or other physical barrier to public access.[123] Thus, from a PSD perspective, there are two elements to be considered: (1) whether the land is owned or controlled by NRG and (2) whether NRG has precluded public access with a fence or other physical barrier.

c. Valence's Arguments

Valence maintains that, as the mineral lessee, it owns the minerals under the lands covered by its leases as well as the accompanying implied easement on the NRG surface estate.[124] To be clear, Valence argues that it is not a lessee in the context of the law of landlord and tenant, but rather is the legal owner of land—namely, the mineral estate.[125] Valence may access its property interests on the Limestone Property without any NRG right of restriction. As such, Valence submits that portions of the Limestone Property are not under NRG's common control or ownership and thus are not NRG's "property" for purposes of the State Effects Review.

Valence charges that it is NRG's burden to prove that it owns or controls all of the property at issue and that, without such proof, NRG incorrectly limited its State Effects and PSD

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[122] Valence Ex. 45, at NRG 007127 [Memorandum from Stephen D. Page, Office of Air Quality Planning & Standards, EPA to Regional Air Division Directors, *Interpretation of "Ambient Air" In Situations Involving Leased Land Under Regulations for Prevention of Significant Deterioration (PSD)*(June 22, 2007)](Page Memo).

[123] NRG Ex. 37; TCEQ *Air Quality Modeling Guidelines* at 48: "Ambient air for state modeling starts at the applicant's property line. However for PSD modeling, ambient air starts at the applicant's fence line or other physical barrier to public access."

[124] Valence *Reply Brief,* at 7 [citing, among others, *Natural Gas Pipeline Co. of America v. Pool,* 124 S.W.3d 188, 192 (Tex. 2003)].

[125] *Cherokee Water Co. v. Forderhause,* 641 S.W.2d 522, 525 (Tex. 1982). The term "lease," when used in an oil and gas context, is a misnomer. The oil and gas lease creates a determinable fee.

reviews to off-property modeling.[126] Valence's ownership and activities were not disclosed to TCEQ staff at the time of technical review and, when the issue was fleshed out during the evidentiary hearing, it became readily apparent that NRG does not fully control access to the Limestone Station property. Due to these alleged shortcomings, NRG did not consider relevant impacts to Valence employees and contractors when it performed its modeling.[127] Because it has an ownership interest in the property, and NRG does not control its access, Valence urges a finding that NRG is not the sole owner of the property and, thus, modeling receptors were required to be located on the property.

In the alternative, should Valence's property rights not be recognized as defeating NRG's sole ownership, then Valence argues it must be considered at least a member of the general public in regard to NRG's property. Valence insists that NRG cannot have it both ways; Valence must either be a property owner or a member of the general public. Even in the absence of its rights as a property owner, Valence argues there is sufficient proof for finding that it is a member of the public with unrestricted access to the Limestone Station property. Specifically, Valence asserts that NRG has no legal right to restrict its access and Valence does not have to cross any NRG physical barriers to access the property.

Valence disagrees with NRG's argument that it is not a member of the general public but instead has some other unnamed status merely because all members of the general public do not share Valence's right of access to the property. Maria Remmert, former TCEQ employee and State Health Effects reviewer, testified on behalf of Valence. In her testimony, she disagreed strongly with any assertion by NRG that a right of entry to property must be generalized for someone to be considered a member of the general public. She pointed out that such a contention would result in homeowners not being considered members of the general public

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[126] Valence failed to separate the State Health Effects review from the PSD review. For instance, Valence argues that information on control of the property was needed for Staff to conduct its State Health Effects review. However, for the State Health Effects review an applicant need not prove control of the property with a natural boundary or fence. Rather, the state looks to the actual property line as sufficient.

[127] *See* 30 TEX. ADMIN. CODE § 101.1(83) that defines "property" as all land under common control or ownership.

simply because they have special rights to enter their own home and property that are not shared by everyone else. Rather, Ms. Remmert testified that Valence workers, employees or contractors are just as much a part of the general public as is the owner of a nearby private residence. Valence insists that the State Effects Review must protect nearby private homes as well as other property owners, including mineral property owners with a right of access to the property.

While admitting that Valence employees and contractors could be classified as industrial workers, Ms. Remmert also considered them members of the general public because they are not present at the site for the benefit of NRG.[128] Valence insists that, pursuant to the EPA's 2007 Page Memo, anyone not employed by or under the control of NRG is a member of the general public.[129] In that same memo, EPA suggests that the general public includes persons who do not require permission to be on the property and persons who are frequently permitted to enter restricted-access land for a purpose that does not ordinarily benefit the business.[130] While this would exclude business invitees (*e.g.*, repair persons, suppliers, mail carriers) from inclusion as the general public, Valence distinguishes its employees and contractors because they do not need NRG's permission to enter the land nor do they enter the land for NRG's benefit.

In addition to the EPA guidance memo, Valence notes that TCEQ Senior Toxicologist Jong-Song Lee, Ph.D., M.P.H., testified that the determination of whether Valence employees and contractors were members of the general public would hinge on their access to the property.[131] Valence urges that since NRG has no right to deny it entry onto the property, Valence and its contractors are members of the general public and the air above their worksites is ambient. Valence's chief executive officer, Walter "Bud" Scherr, testified that even a week before the evidentiary hearing, he visited Valence facilities on the land in question by simply driving down a public road, turning onto a Valence lease road and traveling through a Valence

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[128] Tr. at 854.

[129] Valence Ex. 45, at NRG 007130.

[130] Valence Ex. 45, at NRG 007131.

[131] Tr. at 1081.

gate.[132] Valence emphasizes that it does not have to go through an NRG-controlled gate, does not go through NRG security, and does not pass through an NRG fence. When asked how often Valence does this, Mr. Scherr testified that Valence has contractors, called pumpers, who physically visit their wells for several hours each day.

Because of Valence's interest in or access to the property, Valence asserts that NRG was required to have modeling receptors on-site for purposes of its air quality modeling. Because NRG did not do this, Valence urges that NRG's modeling analysis is fatally flawed, requiring the present application to be denied or at least remanded so that NRG can properly conduct modeling for the State and federal reviews.

d. NRG's Arguments

NRG submits that both State and federal definitions of "ambient air" require consideration of only property where the general public has access.[133] Moreover, MERA specifically instructs that ambient air starts at the property line and limits consideration of the maximum ground level concentration (GLC_{max}) to off-property receptors.[134] NRG notes that Mr. Linville, TCEQ air permitting staff, explained the reasoning behind such a policy, stating that anything on a company's property is an OSHA issue and not an air quality issue.[135] Other witnesses confirmed that on-property impacts are never part of the State Effects review.[136]

NRG asserts the on-site modeling issue is limited to: (1) whether a person or entity is the general public and, if so, (2) whether that person or entity has access to the portion of atmosphere in question. Thus, according to NRG, the "access" issue only arises in regard to

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[132] Tr. at 837.

[133] 30 TEX. ADMIN. CODE § 101.1(4).

[134] NRG Ex. 43, at 19-20.

[135] NRG Ex. 73, at 108. Mr. Linville is a P.E. and holds the title of Technical Specialist in the TCEQ Air Permits Division.

[136] NRG Ex. 73, at 107-108; NRG Ex. 74, at 216; NRG Ex. 76, at 16.

persons first considered to be part of the general public. NRG contends that Valence is a mineral interest owner and not the general public, so the analysis stops without reaching the question of "access." NRG acknowledges that, as the mineral interest owner, Valence has a dominant right to use the surface estate. But NRG adds that the more relevant point is that Valence's right is limited to activities in connection with its mineral interests and that Valence has a duty to accommodate NRG's use of the surface estate. This Valence obligation is not shared by members of the public such as nearby landowners and, therefore, separates Valence from the "general public" category.

Offering its own interpretation of the EPA Page Memo, NRG finds that it supports a determination that Valence is not a part of the general public. Examples of the public included in the memo are attendees at sporting events, customers of restaurants, and patrons to retail businesses. In contrast, NRG maintains that employees of a lessee are designated as business invitees and not the general public. In NRG's judgment, employees of a mineral rights owner are more akin to business invitees than the public at large. Valence's employees and contractors are invited onto the property for a specific and limited purpose, and have no right to use the surface for any other purpose. Thus, NRG contends they are not members of the general public.

To the extent that "access" is a critical issue, NRG maintains that the issue is driven by a person's rights and purposes for being on the property, not merely their presence. Members of the public are excluded from entry to the property by fencing and gates. NRG alleges that it is not relevant whether the fencing is owned by NRG or Valence, the important point is the pubic is locked out and Valence has no right to allow the general public access to the Limestone Station property.

As a final point, NRG maintains that past Commission precedent establishes that mineral interests are insignificant to the permitting process. While not exactly on point, one of the issues presented in a 2004 contested case was whether landfill surface owners needed some demonstration of the right to use the property, including the mineral interests, or at least a

reasonable demonstration of the ability to accommodate the mineral interests should the landfill be built.[137] The Commission indicated that no such determination was necessary and amended its rules to indicate that showing ownership of the surface rights was sufficient.[138] While admitting that this decision is not determinative of the present issue, NRG argues it is some indication of the Commission's focus on the surface estate, rather than the mineral estate. NRG submits that because Valence is not the general public, it was unnecessary for the application to include on-property receptors for NAAQS and PSD Increment modeling.

e. The ED's Position

The ED states that the determination of whether an individual is considered a member of the general public is based on a number of factors, including that person's access to the particular property. Unfortunately, the application did not include any information regarding the access of Valence employees or contractors to the property and their right to do so. Given the information provided during the hearing, Dr. Lee testified that the ultimate determination on whether Valence's employees should have been included in the State Effects Review would depend upon the issue of access, and the ED concludes in its closing brief that there is insufficient evidence in the record to make a determination either way.[139]

f. ALJs' Analysis

Ultimately, the ALJs recommend that the Commission find that the Limestone Station property is solely owned by NRG—at least for environmental regulatory purposes—and that modeling for purposes of State Effects Review was conducted in accordance with all applicable regulations. However, as the property is presently managed without an effective barrier or fence

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[137] Application by Juliff Gardens, L.L.C., for a Permit to Operate a Type IV Municipal Solid Waste Landfill Facility, TCEQ Docket No. 2002-0117-MSW (October 4, 2004)(Final Order denying application).

[138] 30 Tex. Admin. Code § 330.67.

[139] On a related note, Dr. Lee testified that, if Valence employees should be considered in the State Effects review, they would be treated as industrial receptors and not members of the general public. Tr. at 1055.

line totally encompassing the Limestone Station property, NRG should be required to build additional fencing to fully satisfy federal regulations concerning PSD Increment modeling. This requirement may be implemented as an additional permit term. The bases for these recommendations are set out below.

First, for purposes of the State Effects review, the ALJs conclude that state guidance dictates that modeling starts at the property line without any further showing of control. Specifically, the Commission's MERA guidance emphasizes that, for modeling purposes, ambient air starts at the property line.[140] There is no requirement, in rule or guidance, for a physical barrier. So, Valence's mineral interest and right of access does not mandate an on-site receptor for the State Effects review.

But the TCEQ guidance recognizes this is different for a PSD analysis, because the NAAQS and PSD Increment review requires more; mere property line designations that satisfy the State effects review are insufficient for PSD purposes. This difference is noted in the Commission's Air Quality Modeling Guidelines. In order to exempt on-property receptors from PSD modeling, applicants must have a fence line or other physical barrier to public access, and it is NRG's burden to prove it controls or will control access to the Limestone Station property. While the application does not presently prove this, the ALJs find this may properly be remedied by adding a permit term requiring fencing.

Turning to the first issue raised by Valence, whether NRG failed to show sole ownership of the property because of Valence's mineral interests, the ALJs find NRG met its burden of proof. In doing so, the ALJs disagree with Valence's contentions that, as the lessee of mineral rights, it must either be considered an owner of property—defeating the common ownership requirements necessary for exemption of on-property modeling—or be considered a member of the general public with unrestricted access, also defeating the exemption requirements for on-

[140] NRG Ex. 43. Modeling and Effects Review Applicability: How to Determine the Scope of Modeling and Effects Review for Air Permits (MERA)(2008).

property modeling. Rather, the ALJs recommend the Commission find that Valence's mineral rights are limited such that they do not defeat the general ownership designation of the surface estate. EPA discusses the issue of common control, explaining that control of the land means that the source has certain rights to the use of the land/property, including the power to control public access to it.[141] Valence's activities, while not limited by contract are still limited by the law regarding mineral estates. Except as related to Valence's limited activities concerning its drilling operations, NRG maintains the sole right to control the use of the property and the sole right to control access to the property. [142] Thus, the ALJs do not construe Valence as an "owner" of the property for environmental regulatory purposes.

Next, the ALJs must consider whether Valence should be considered the "general public" in regard to NRG. The Page Memo defines general public at it relates to a lessor to generally include anyone who is not employed by or under control of the lessor, but, more specifically, persons who do not require lessor's permission to be on the property.[143] An argument could be made from this definition that, because Valence has its own legal right to be on the property and does not need NRG's permission, then Valence is the general public. But further explanation by EPA in the Page Memo would not reasonably lead to such an understanding.

The Page Memo goes on to state that, "[W]here part of the owned property is leased to another source, employees of the lessee source are considered business invitees of the lessor source as are those who seek visitation rights to the lessee. Both must have the lessor's permission to be on the property (*e.g.*, attain approved access via a security gate)." While Valence admittedly has a legal right—not an invitation—to use portions of NRG's surface property, the business invitee example appears most analogous to Valence's employees and contractors. NRG is required by law to invite or allow Valence employees and contractors on the surface property. But still, NRG retains the right to oversee Valence's limited use of the

[141] Valence Ex. 45, at NRG 007128.

[142] The ALJs address below whether NRG is presently exerting that right to control access.

[143] Valence Ex. 45, at NRG 007130.

surface property to make sure it is proper and not abused. NRG may certainly require Valence employees and contractors to provide identification and record ingress and egress at a security gate.

The ALJs thus recommend a finding that Valence and its contractors are not members of the general public, as Valence's actions on the property are more akin to that of a business invitee. With its special relationship or status, Valence falls between a regulatory ownership interest for environmental purposes and being a member of the general public. NRG thus met its burden of proving that the Limestone Property is under its common control or ownership and that Valence, as a mineral rights owner, is not a member of the general public.[144]

However, for federal PSD review, the analysis does not end with the first step of classifying Valence as not part of the general public. Rather, the next step must also be considered—whether access to the property is limited. If one principle can be gleamed from the EPA's Page Memo, it is that control over access to the property is the overriding concern. TCEQ Senior Toxicologist Jong-Song Lee suggested as much when he indicated that whether he would include an evaluation of Valence's employees as grid receptors for modeling would turn on whether NRG controlled access to the property.[145] Dr. Lee further stated that, given the testimony he heard during the hearing, it appeared that Valence had access to the property without NRG having established any control over that access.[146]

Taking Dr. Lee's determination into consideration, the ED stated in its Closing Brief that it was unconvinced that NRG controlled Valence's access. In particular, the ED noted:

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[144] The ALJs do not address the question of whether OSHA has sole jurisdiction over regulation of the Limestone Station property because insufficient evidence was offered to prove one way or the other. In any event, a determination of the relationship between TCEQ and OSHA would not be dispositive for the PSD review.

[145] Tr. at 1081.

[146] Tr. at 1069-70.

> At trial, conflicting evidence was provided regarding the extent to which NRG controls Valence's access to its property and whether any access agreements exist between the two companies. Therefore, there is insufficient evidence in the record to determine whether or not Valence employees should have been included in the Health Effects Review.[147]

But the ED stopped short of finding that NRG's control over access was necessary to approve the application. In fact, the ED did not take a position on what was required, remaining mostly silent on this issue in its briefing. The ALJs agree with the ED's assessment of the evidence—essentially that NRG failed to prove it controlled access to the property. However, unlike the ED, who recommends approval of the application anyway, the ALJs believe that NRG has a burden of establishing this control before a permit can be issued. Therefore, the ALJs conclude that any lack of evidence on this point requires at least a permit amendment establishing controlled access by NRG before the facility is operational.

NRG apparently interprets the PSD requirements and Dr. Lee's words differently. NRG asserts that Dr. Lee meant to indicate the issue *could* turn on access if Valence was first determined to be a member of the general public. But the two issues ("is Valence the general public?" and "does the general public have access?") may not so easily be separated. Rather, an evaluation of Valence's unique rights and frequent access may impact whether Valence should be considered a member of the general public. This is certainly true for the PSD Increment review modeling as evidenced by the EPA's Page Memo, with its many scenarios and machinations for determining the "general public" and whether control is established by the entity seeking a permit. The Page Memo is EPA's response to various inquiries concerning its interpretation of the definition of ambient air under the PSD program. It addresses lessees and lessors, is largely analogous to the NRG/Valence situation, and is the best indication of likely EPA policy concerning surface and mineral estate owners.

One requirement the ALJs glean from the Page Memo concerning PSD Increment modeling is that the owner or operator must have a barrier around the property preventing public

[147] ED's Closing Argument, at 8.

access if it wishes to claim the air is not ambient. It is not enough that the public, in general, does not access the property. The air above the property will be considered "not ambient" for NRG's modeling only if NRG is providing a physical barrier or fence line to control access to the property. EPA states:

> With respect to a particular source, EPA's practice has been to exempt only an area from ambient air when the source (1) owns or controls the land or property; and (2) precludes public access to the land or property using a fence or other effective physical barrier.[148]

The Page Memo goes into numerous fact scenarios and has an attached support document that provides further analyses regarding when air over a property may or may not be considered "ambient." These examples suggest that whether an entity with particular access rights to a property is considered to be the general public may depend upon whether that entity has legal and actual control over the access of others to the property. At a minimum, the EPA guidance tends to belie NRG's claim that, for modeling purposes, it matters not whether it or Valence is exerting control over the property, so long as access is controlled by one entity or the other. This would be appropriate only where the two entities have an existing business relationship. While the Page Memo does not have a fact example specifically analyzing the particular outcomes between surface and mineral rights owners, it offers the following guidance by analogy (the ALJs' comments are in italics after each):[149]

1. With two or more companies in an existing business relationship and a single source, so long as there is a barrier preventing public access, the air over the entire property (including that portioned leased) is not ambient air to either the property owner (lessor) or the lessee.[150] In absence of a barrier preventing public access, the air is ambient air for both property owners. *This is distinct from the present case where there is a lack of an existing business relationship between NRG and Valence.*

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[148] Valence Ex. 45, at NRG 007124.

[149] Valence Ex. 45, at NRG 007124

[150] Valence Ex. 45, at NRG 007124.

2. When two (or more) companies operate separate sources on a property owned by one company and leased in part to the other, and the lessor retains control over public access to the entire property and actually maintains a physical barrier around it to preclude public access: the air over the entire property (including the leased portion) is not ambient air to the lessor; the air over the non-leased portion of the property is ambient air to the lessee; and the air over the leased portion is ambient air to the lessee unless the lessee undertakes its own separate action to preclude public access. *This is distinct from the present case because Valence does not operate a separate source.*

3. When two (or more) companies operate separate sources on property owned by one company and leased in part to the other, and the lessor grants the lessee sole control over who may access the leased property (e.g., leased property with direct access via entrance on outer perimeter of lessor's land): the air over the property retained for use by the lessor is not ambient air to the lessor if public access is precluded; the air over the lessor's property is ambient air to the lessee; the air over the leased property is ambient air to the lessor; and the air over the leased property is ambient air to the lessee unless the lessee acts to preclude public access to the leased property. *This is distinct from the present case because Valence does not operate a separate source.*

The first scenario is where NRG "hangs its hat," suggesting that it does not matter whether it or Valence establishes the physical barrier as long as a barrier is established by one of the two entities to prevent entry by the general public. But as noted above, NRG's argument is undermined by the lack of a business relationship between it and Valence.

The third scenario is more representative of the present situation at the Limestone Station and is one of the bases for Valence's position. Mr. Scherr's testimony substantiated a finding that NRG essentially allows Valence to control access to parts of the Limestone Station property with a Valence gate. In accordance with PSD modeling guidelines and the EPA's Page Memo, air above the land controlled by Valence would arguably then be ambient air to NRG.

Scenario two represents the situation if Limestone Unit 3 is permitted with the suggested permit amendment. NRG would retake control over access to all of the Limestone Station property from Valence, providing its own fencing, gating, and accountability for granting access to the property. It is entirely appropriate for NRG to check the identities of persons or otherwise

oversee access to Limestone Station—including access by Valence employees and its contractors. Otherwise, how would NRG know who is on the property and whether they have a right (like Valence) or invitation to be on the property?[151] Only with such control do the ALJs find that NRG has sufficiently met the two pronged test for on-property exemption from PSD ambient air review.

The evidence presented does not establish that NRG currently has a barrier to public access completely around the Limestone Station property. Therefore, the ALJs recommend that the Commission add a requirement that the entire property be encircled with a fence or other barrier under NRG's control before the new source be constructed. The ALJs understand that NRG has agreed to this requirement.

3. Did the Modeling Data Fail to Analyze Present Impacts from Limestone Units 1 and 2, which are already in violation of the 24-hour PM_{10} PSD increment of 30 $\mu g/m^3$?

This is the first of a number of issues raised by Sierra Club witness Camille Marie Sears, Atmospheric Scientist. On this issue, Ms. Sears testified that NRG's modeling failed to appropriately analyze present impacts from Limestone Units 1 and 2, which are already in violation of the 24-hour PM_{10} PSD increment of 30 micrograms per cubic meter ($\mu g/m^3$). Ms. Sears testified that, using the same model and files developed by NRG and the ED, she performed air modeling on the existing Limestone Units 1 and 2 to see what amount of the 24-hour PM_{10} PSD increment of 30 $\mu g/m^3$ was already consumed. Her findings were a troubling 32.74 $\mu g/m^3$. In other words, according to Ms. Sears, the present emissions from current NRG facilities already exceed the PSD increment.

In light of Ms. Sears' findings, Sierra Club insists that the draft permit may not be issued and that construction on Limestone Unit 3 may not begin, at least until TCEQ takes certain steps to find additional capacity in the PM_{10} increment that will allow for the emissions from

[151] Valence Ex. 45, at NRG 007130.

Limestone Unit 3. Sierra Club urges that to do otherwise and allow Limestone Unit 3 to be permitted would clearly lead to the creation of air pollution in excess of the federal standards. The Clean Air Act prohibits construction of any major emitting facility unless it is demonstrated that the emissions will not cause or contribute to air pollution in excess of any PSD Increment, NAAQS, or any other emission standard.[152]

Because of this predicted exceedance of the PM_{10} increment, Sierra Club also maintains that the ED should have required pre-construction monitoring to better ascertain the actual impacts. Ms. Sears testified that she believes that pre-construction monitoring, if done, would show a measured and existing increment violation from Limestone Units 1 and 2.[153] Ms. Sears further discussed why she observed a predicted violation using the same model and inputs used by NRG, even though NRG had not observed such a violation. She explained that NRG initially modeled only the Limestone Unit 3 impacts and further reviewed only those 24-hour PM_{10} impacts that were predicted to be greater than 5 $\mu g/m^3$, which is the significant impact level (SIL).[154] This greatly reduced the potential for modeling exceedances because it left NRG with only a few receptors where impacts from all units (*i.e.*, Units 1, 2, and 3) were actually considered and modeled.

However, when Ms. Sears examined all of the receptors around the Limestone Property and added in the modeled impacts from Unit 3 to the existing impacts, she identified several PSD increment violations. She found that impacts from the existing units alone (Units 1 and 2) created an increment violation of 32.74 $\mu g/m^3$ for 24-hour PM_{10}, with an additional impact of 3 $\mu g/m^3$ if Unit 3 is operating. So while the impact of Unit 3 may be below the *de minimis* level for 24 hour PM_{10}, the actual total impact is 35.74 $\mu g/m^3$—well above the 30 $\mu g/m^3$ PSD increment level.

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[152] Federal Clean Air Act, Section 165(a), 42 U.S.C. §7475(a).

[153] Sierra Club Ex. 3, at 11.

[154] This amount was regulatorily determined to be the significance level for PM_{10} although, as discussed below, Sierra Club objects to this *de minimis* (*i.e.*, SIL) level because it is more than 16% of the 30 $\mu g/m^3$ 24-hr PM_{10} increment standard.

Ms. Sears urged that this result is from a SIL that is already too high (namely, 16.7% of the 30 $\mu g/m^3$ 24-hr PM_{10} increment). Experts for the ED and Applicant pointed to the NAAQS and the New Source Review Workshop Manual in support of their SIL.[155] But on cross-examination, these experts admitted that when the SIL was included in the manual, it concerned only NAAQS. At that time, EPA had not yet developed PM_{10} increments. Sierra Club argues that to use the same SIL for the PM_{10} NAAQS as for the PM_{10} increment level is "preposterous." Sierra Club notes that 5 $\mu g/m^3$ SIL represented only 3.3% of the standard it was originally based upon—the 150 $\mu g/m^3$ NAAQS 24-hour for PM_{10}. But, it represents a whopping 16.7% of the standard as presently applied to the 24-hr PM_{10} increment.[156]

Arijit Pakrasi, Ph.D., P.E. and NRG's Senior Air Consultant, agreed with Sierra Club's calculations as a percentage of the standards, but not with Sierra Club's characterization of the results. He viewed the SIL as standing alone, an ultimate determination as to what is a significant concentration for the purposes of any PM_{10} modeling.[157] Whether the SIL was developed for NAAQS or for the increment level is irrelevant; the 5 $\mu g/m^3$ SIL remains the level at which emissions become of interest.

The ED found all aspects of NRG's modeling to be acceptable. Mr. Opiela, TCEQ Technical Specialist for air dispersion modeling, noted that the SIL relied upon by NRG is the same that is used in every TCEQ air case to demonstrate whether there would be a NAAQS or PSD increment violation. He further noted that, in 2007, the EPA stated that the NAAQS significance levels should apply to sources located in a PSD area and that, based on EPA interpretations and guidance, these levels have also been widely used in the PSD program to define the extent of the impact area where an increment analysis must be performed.[158]

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[155] Tr. at 273 and 1044. NRG Ex. 32, at C.28.

[156] Sierra Club's Response to Closing Arguments, at 15.

[157] Tr. at 274.

[158] Tr. at 1041. ED Ex. 23, at 31377 n.4.

In its briefing, NRG did not challenge Ms. Sears' modeled prediction of PM_{10} exceedances. Rather, it submits that Limestone Unit 3 could only cause or contribute to an increment violation if the impacts of Limestone Unit 3 itself were deemed significant at the point and time of the modeled violation.[159] Since there is no violation at the modeled receptors where Unit 3 has an impact of 5 $\mu g/m^3$ or greater, NRG insists it has met all regulations. Moreover, NRG maintains that specific EPA guidance allows Unit 3 to be constructed even while modeled impacts from Limestone Units 1 and 2 show violations:

> A modeled violation of a NAAQS or PSD increment may be predicted within the impact area, but, upon further analysis, it is determined that the proposed source will not have a significant impact (*i.e.,* will not be above *de minimis* levels) at the point and time of the modeled violation. When this occurs, the proposed source may be issued a permit (even when a new violation would result from its insignificant impact), but the state must also take the appropriate steps to substantiate the NAAQS or increment violation and correct it through the State Implementation plan (SIP). . . .[160]

NRG asserts that if credence is given to Ms. Sears' predicted violations, her modeling would only start the analysis and not be the final determination. According to the above EPA guidance, one of NRG's experts explained that the next step would be to determine whether the predicted violation is realistic by looking at the other sources that might be predicted to contribute to the violation and see whether they were calculated correctly.[161] Given the opportunity, he would have examined the emission rates to see if they were realistic and looked for other modeling errors. Based upon what he found, the appropriate action would be to re-model the sources with the corrections or more accurate data. If the predicted violations were eliminated, Mr. Cabe indicated no further SIP action would be necessary by the state. But NRG insisted that even if the modeled violations remained, Limestone Unit 3 may be permitted because its contribution is *de minimis*.

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[159] NRG Ex. 81, at 2.

[160] NRG Ex. 81, at 2.

[161] Tr. at 1142.

The ALJs understand that 5 $\mu g/m^3$ is the *de minimis* amount for 24-hour PM_{10} in regard to both the NAAQS and the PSD increment level. Even Ms. Sears admitted this was the long-standing policy of both the EPA and TCEQ. The concerns expressed by Sierra Club are better addressed through requested rule-making than a contested case, where the ALJs are limited to the hearing record. For purposes of this hearing, the policy is clear and reasonable and establishes the particular emission amounts under which no significant impact is deemed to occur, regardless of the standard at issue. The modeling demonstrates compliance with this standard.

The more troubling issue is that the record reflects potential PSD increment violations. To be clear, the record also suggests that NRG met its initial burden of proof by properly following TCEQ guidance and finding no PSD PM_{10} increment violations. It is acceptable that NRG did not discover this issue when conducting its modeling, which properly focused on the impacts of Limestone Unit 3.[162] Nevertheless, Ms. Sears and Sierra Club expanded the modeling and took into consideration all sources at all receptors. This would not be improper modeling nor is it irrelevant information. It is just beyond what is required of an applicant to demonstrate compliance.

On the other had, the ALJs do not conclude from Ms. Sears' modeling that there are increment violations presently occurring. Ms. Sears used the data and inputs relied on by NRG for its modeling. NRG relied on conservative modeling techniques that, while appropriate for the modeling regime prescribed by Commission guidelines, would need to be refined for the modeling performed by Ms. Sears. And, under applicable state and federal guidance, her modeling results would just require a greater analysis; they would not be dispositive by themselves.

[162] Ms. Sears provided a good explanation for how this occurred and her testimony was not challenged on this point.

Moreover, regardless of whether new violations are shown, the ALJs agree with NRG that the Commission is not precluded from issuing this permit. As noted, EPA guidance provides that, under these circumstances, a proposed source "may be issued a permit (even when a new violation would result from its insignificant impact), but the state must also take the appropriate steps to substantiate the NAAQS or increment violation and correct it through the [SIP]."[163] Thus, the ALJs find technical and regulatory reasons why Ms. Sears' modeling alone is not predictive of violations nor would it preclude the permit from being issued in this case.

Even so, given the concerns raised by Ms. Sears' modeling, the ALJs recommend the Commission instruct the ED to take appropriate steps to substantiate the violation and to correct it through the SIP, if necessary. This approach will appropriately continue the well-established policy of the Commission, hold NRG to the same standards as other applicants, and protect the environment in accordance with EPA's Memorandum for Air Quality Analysis.

4. Does the Modeling Properly Account for Road and Fugitive Emissions?

Ms. Sears has raised two objections regarding road and fugitive emissions. First, she contends that TCEQ's modeling practice for 24-hour PM_{10} emissions results in an under-prediction of impacts because TCEQ exempts daily haul road emissions. Second, she contends that TCEQ modeling artificially reduced low-level fugitive dust emissions by 40 percent due to the use of a 0.6 fugitive adjustment factor. Both of these contentions are discussed below.

a. Sierra Club's Arguments

As a preliminary matter, Sierra Club argues that the Commission is prohibited from altering, modifying, or in any way departing from the air quality modeling procedures established by EPA for the PSD program of the Clean Air Act, without first obtaining EPA's

[163] NRG Ex. 81, at 2.

approval after notice and comment.[164] In accordance with this requirement, Commission rules establish:

> All estimates of ambient concentrations required under this subsection shall be based on the applicable air quality models and modeling procedures specified in the EPA Guideline on Air Quality Models, as amended, or models and modeling procedures currently approved by the EPA for use in the state program, and other specific provisions made in the prevention of significant deterioration state implementation plan.[165]

This rule continues by stating that any changes to the modeling are subject to notice and opportunity for public comment, with written approval obtained from the administrator of the EPA. Sierra Club submits that the Commission has not received EPA approval for exempting daily haul road emissions nor for the 0.6 fugitive adjustment factor. To the contrary, Sierra Club notes EPA has specifically disapproved of the 0.6 factor in the past and cites to the following language in EPA correspondence to the TCEQ concerning a separate PSD application:

> In the modeling report, a TCEQ guidance memo on adjusting low level particulate emissions by a factor of 0.6 is discussed, and the applicant indicates that it has been used in this analysis. This factor is also used by the applicant in other parts of the permit application. This discounting factor has never been approved by EPA for PSD NAAQS and Increment analysis. Modeling that is required for PM/PM10 or other particulate matter species should be redone without this adjustment factor for the purposes of PSD related modeling.[166]

NRG used the ISCST3 to perform its modeling. Ms. Sears maintains that this model has been subject to numerous validation exercises to confirm its efficacy, all performed before it was approved for use. She insists that any variances from the approved model must be evaluated with similar rigor and then approved by the EPA before implementation. For instance, to validate adjustments regarding fugitive emissions, Ms. Sears suggests the Commission could have performed a detailed inventory of existing NRG PM_{10} emissions, modeled them, and then

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[164] 40 C.F.R. § 51.166(1).

[165] 30 TEX. ADMIN. CODE § 116.160(d).

[166] Sierra Club Ex. 36, at 7.

compared them to monitored fence-line air concentrations. However, she is unaware of any effort by the Commission to perform such model evaluations to justify the 0.6 low-level fugitive PM_{10} adjustment factor and, thus, concludes it cannot be applied.

According to Ms. Sears, the Commission has also failed to perform any model evaluation to verify its concerns with road emissions. She described the Commission's lack of confidence with modeled road emissions as hypothetical and unverified. Ms. Sears has reviewed other coal-fired facility applications throughout the U.S. and she believes the TCEQ's ISCST3 adjustments are unique and unorthodox practices.[167] Sierra Club urges that these practices must be found incompatible with EPA modeling and guidance and that the modeling performed by NRG be found to be insufficient for PSD NAAQS and Increment analysis.

Turning specifically to the Commission practice of excluding 24-hour air quality impacts caused by road emissions, Ms Sears made the following points:

a. The Limestone Units are major source categories which, by definition, must include fugitive emissions as a part of their inventory;[168]

b. For the Commission to argue that unless site-specific information is used, emissions estimates of one year are unreliable but then not to require collection of that site specific information is a self-defeating argument. The TCEQ should require simple collection of site-specific parameters, such as road area silt loading (mass of silt-size material per unit area of the travel surface) and then use the emission estimates.

c. When site-specific information is gained, emission factors may be categorized resulting in some of the most reliable factors available.

d. Commission fears that the type and amount of road traffic will not be uniform and will skew the modeling are not well-founded. As with other modeling data inputs, the highs and lows are averaged out in the emissions factors. For instance, with the hourly-average meteorological data such as wind speed, it may be very high at certain points during an hour but it is the averaged-hourly value that is

[167] Sierra Club Ex. 3, at 15.

[168] 40 C.F.R. § 52.21.

> important. Similarly, the road emissions may have peaks and valleys but the average is what is important.

Ms. Sears emphasized that to eliminate 24-hour road emissions from modeling consideration is to remove one of the most likely sources of PSD increment violations. She noted that road dust emissions cause higher PM_{10} impacts than emissions from the boilers at many coal-fired power plants. This results from the lack of stack dispersement, and the lack of buoyancy for these emissions leads to particularly high air quality impacts. Rather than choosing to ignore these high impacts because they may cause PSD increment and NAAQS violations, Ms. Sears urges that it is essential to count and address their impacts.

Using the same model and input files used by NRG, Ms. Sears re-analyzed the impacts with the road source emissions considered. In order to do this, she had to rely on the annual-averages for the road emissions in lieu of the actual 24-hour emissions. While the annual emissions data under-estimated the impacts, Ms. Sears found it far more accurate than the total exclusion performed in the NRG modeling. Her analysis resulted in a highest-second-high 24-hour PM_{10} air concentration of 31.31 $\mu g/m^3$, a clear violation of the 24-hour PM_{10} PSD increment.

Protestants allege that NRG's use of a 0.6 adjustment factor for fugitive PM_{10} emissions sources had a similar impact on the modeling results—*i.e*, reducing the impacts which otherwise would have shown violation of the PSD increment. Ms. Sears has calculated fugitive dust emissions for input in dispersion modeling many times (including for coal-fired power plants) but has never seen PM_{10} emission rates artificially reduced in this manner.[169] She went so far as to indicate that, based on her history of reviews, the TCEQ is alone in adjusting the fugitive emission rates in what she characterizes as an attempt to reduce calculated air concentrations from fugitive emissions in order to meet some pre-determined goal.[170] To her dismay, Ms. Sears

[169] Sierra Club Ex. 3, at 19.

[170] Sierra Club Ex. 3, at 19.

insists there is no evidence to support the TCEQ's concern that, without such a reduction, the modeling results are too conservative and over-predict impacts.

Finally, Ms. Sears challenges the underlying rationale for the adjustment factor, namely that concentrations modeled from low-level fugitive emissions pursuant to EPA's Industrial Source Complex Short-Term model (ISCST3) are valid for only three-minute periods and need to be adjusted to the hourly standard. The guidelines state that the ISCST3 is appropriate for one-hour averaging times and Ms. Sears sees no reason to deviate from this. She noted that the Commission applied the adjustment factor only to low-level fugitive PM_{10} emissions and opined that, if such an adjustment were necessary due to modeling error, it would need to be applied to all modeled sources. Ms. Sears concluded that the TCEQ is simply trying to suppress valid concerns arising from low-level fugitive PM_{10} emissions.[171]

b. NRG's Arguments

NRG states that it excluded haul road emissions from the modeling runs in accordance with the TCEQ Air Quality Modeling Guidelines and in accordance with well-settled Commission policy.[172] Specifically, NRG notes that, in the Commission's 2007 Final Order in the *Oak Grove* case, Finding of Fact No. 29 states that, "[U]nder TCEQ's modeling guidance, modeling of road dust is explicitly excluded for short-term averaging permits."[173] This reason alone, asserts NRG, is enough to reject Ms. Sears' opinions and modeling runs.[174]

Turning to the 0.6 fugitive adjustment factor, NRG notes that it made this adjustment in accordance with TCEQ policy. In particular, NRG pointed to a 2002 TCEQ memorandum from Dom Ruggeri, Team Leader of the TCEQ's Air Dispersion Modeling Team, explaining

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[171] Sierra Club Ex. 3, at 22.

[172] NRG Ex. 37, at 58.

[173] NRG Ex. 84, at 5.

[174] NRG also argued and presented evidence that its modeling was conservative, accurate, and protective of human health and the environment.

implementation of the adjustment policy.[175] According to the memo, the adjustment was implemented because of "gross overpredictions" of low-level fugitive sources by the ISCST3 modeling. NRG notes that its modeling was audited and approved by the ED. Mr. Cabe testified that, in contrast, the modeling performed by Ms. Sears was not consistent with TCEQ modeling policy.[176]

c. The ED's Position

Testifying on behalf of the ED, Mr. Opiela explained that the 0.6 modeling factor was used because the ISCST3 model incorporates a dispersion coefficient that is based on a three-minute average. The dispersion coefficients resulted from a study where three individuals empirically determined how much a plume should be dispersed horizontally and vertically.[177] By inclusion of three-minute values into the one-hour model, the plume was predicted to be very narrow with high concentrations of PM_{10} and very little dispersion. The lack of dispersion is related to the failure for the three minute time frame to take into consideration the changes in wind direction and is particularly over-predictive in situations of light wind, where the wind typically changes direction (is extremely variable) but the three-minute dispersion factor fails to recognize this. In Mr. Opiela's opinion, the emissions are not being changed, just that the dispersion is changed to account for the shortcomings of the dispersion coefficients when the model was developed.[178]

Mr. Opiela also explained the history and rationale behind the Commission's removal of haul road emissions when an applicant agrees to perform best management practices, including the application of water. The controversy over haul road emissions arose during the mid-1990s when TCEQ staff found predicted emissions for small facilities, like concrete batch plants,

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[175] NRG Ex. 35, at 24.

[176] Tr. at 1164.

[177] Tr. at 1006.

[178] Tr. at 1010.

greatly exceeded the actual emissions that were observed. These facilities were applying for standard permits (also called permit-by-rule facilities) where emissions were insignificant. However, the ISCST3 model was predicting numerous violations that in actuality were not occurring. Staff permit reviewers and modelers determined that the best course of action would be for applicants to control road emissions with best management practices so that there were no emissions (at least no visible emissions) to model. The thought was that less emissions were better for the environment and better for the applicants. If applicants eliminated the emissions, they would meet their demonstration of protecting the environment. Because the ED continues to have a lack of confidence in the ISCST3 model as related to haul road emissions, it continues to support exclusion of these emissions from the ISCST3 modeling, so long as the emissions are reduced by the best management practice of applying water to the roads.

d. The ALJs' Analysis

The ALJs defer to the well-established Commission policy. The ED's practice is supported by clear and recent Commission precedent. Moreover, there is no compelling environmental reason for overturning the ED's policy of using a 0.6 modeling factor for fugitive emissions. It is reasonably supported by technical merit. The ALJs are somewhat concerned by the lack of EPA approval of these adjustments, but the EPA was made aware of the adjustments in this case and did not file any objection to them.

The ALJs further recognize the difficulty in enforcing a permit term based upon "best management practice." The road haul emissions are excluded in the modeling with the presumption that NRG will perform road watering, but no watering schedule or other measurable performance is specified. Thus, the ALJs are not certain of the intended management practices that will be used to ensure that road emissions are reduced. Nevertheless, the Commission's adoption of this policy is well-established and the ALJs have no basis for disregarding it.

5. Did NRG's Modeling Rely on Correct Meteorological Data?

Protestants contend that NRG used incorrect modeling data for its air quality modeling. In particular, Dr. Sears raises two primary objections to the meteorological data. First, she asserts that the modeling inappropriately relied upon low-quality meteorological data from the Waco Airport that improperly excluded calm hours. Second, she contends that the TCEQ should have required NRG to collect at least one year of site-specific meteorological data in order to appropriately conduct an air impact assessment.

a. OPIC's Arguments

NRG's use of Waco meteorological data (met data) in its modeling leaves OPIC unable to conclude that the modeling results are reliable; thus, OPIC is unable to recommend that NRG's permit application be granted. While acknowledging that NRG was directed by the ED to use the surrogate met data, OPIC finds it inappropriate for accurately predicting concentrations of air pollutants that will occur from the operation of Limestone Unit 3.

Underlying the issue related to using this data are questions on why the ED failed to require NRG to collect on-site data. OPIC infers that, while surrogate data might be more understandable with a greenfield site, it is unacceptable where the facility has existed for over 20 years and monitoring could have been easily accomplished. Moreover, OPIC notes there are two other coal-fired electric generating units on the property and the accurate consideration of cumulative impacts from all three units, with more precise met data, must be considered to sufficiently evaluate the proposed permit for Limestone Unit 3.

OPIC notes that the EPA has generally found airport data to be lacking in adequacy and improperly used in regulatory modeling applications.[179] The evidence presented during this hearing provided OPIC with no justification for excepting this application from the EPA's

[179] Sierra Club Ex. 8, at 1-1.

general reluctance. Rather, OPIC finds several specific deficiencies in the data used. First, the data was taken from a location 60 miles away from the Limestone Station property. Second, the surface characteristics surrounding the Waco Airport (it is very flat) are different than those around the Limestone Station property (more hills, large trees, and tall buildings).[180] A third point is that wind speeds were not measured with a resolution necessary to meet EPA guidance, because the airport reports no winds of less than three knots.[181] Low wind speeds are allegedly indicative of the times of highest air quality impacts, so this is of critical importance to OPIC.

Finally, OPIC notes that "calm" winds also were excluded from the airport data, again skewing the results to suggest less air quality impacts due what OPIC understands to be an inverse relationship between wind speed and the dispersion of air pollution.[182] For these reasons, OPIC asserts that the ED should abandon its practice of directing applicants to use regional National Weather Service (NWS) data and instead require site-specific meteorological data. Inappropriate and inadequate inputs result in unreliable predictions; therefore, OPIC recommends a finding that NRG has not demonstrated that its applications comply with all applicable air quality standards.

b. Sierra Club's Arguments

Ms. Sears testified that airport data are once-per-hour snapshots and are nowhere near the 60 samples per hour recommended by EPA as necessary to obtain an hourly average of the meteorological conditions.[183] NRG used data gathered from a 1-2 minute observation each hour

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[180] Tr. at 805-806.

[181] Sierra Club Ex. 3, at 26.

[182] Office of Public Interest Counsel's Closing Argument at 7. The ALJs disagree that there is an inverse relation between wind speed and air pollution dispersion. The relationship is direct. The ALJs understand there may be an inverse relation between wind speed and concentration, which may be what OPIC intended. The concern regarding the exclusion of "calm" winds (those approximately two knots per hour) is similar to concerns related to the exclusion of all winds less than three knots. However, the impacts may be different because calm winds may result in low impacts far away (plume rises directly up) while low wind may lead to impacts with higher concentrations and closer to the source. There are many other factors to consider, like buoyancy.

[183] Sierra Club Ex. 3, at 24-25.

and then improperly represented it as hourly averages in modeling. She also explained that the data collected at the Waco Airport lacked the resolution necessary for accurate modeling. The wind speed observations were limited to whole knots per hour, while EPA states wind speed measurements should be accurate to within plus or minus 0.2 meters per second (m/s). Also, the Waco Airport data reported no winds below three knots or 1.54 m/s. Instead, these winds were reported as calm winds and were excluded from the modeling analysis. From a modeling perspective, Ms. Sears found this to be very significant as low wind conditions tend to drive the modeled high impacts. She testified that modeled impacts are inversely proportional to wind speed.

To demonstrate this, Ms. Sears recaptured the calm hours excluded automatically by the model. She reset all calm recordings to 1.0 m/s using the "NOCALM" option. This increased the highest-second-high 24-hour PM_{10} concentration from 26.06 $\mu g/m^3$ to 58.53 $\mu g/m^3$, indicating a significant violation of the 30 $\mu g/m^3$ increment level. Ms. Sears noted that the South Coast Air Quality Management District, the largest agency in California, requires the use of NOCALM in modeling runs.

Ms. Sears disputed the ED's claims that on-site monitoring is rare, stating that site-specific data collected pursuant to EPA's Meteorological Monitoring Guidance for Regulatory Modeling Applications (EPA's Met Guidance) are routine for new and modified emission sources across the country. She insisted that, if they are rare in Texas, it is simply because the ED is not requiring them. She further inferred that the ED's practice defied logic and charged that the ED was not concerned with verifying compliance with the applicable air quality standards and increments.[184] In support of her opinions, she presented this analogy:

> Imagine a crop that is damaged at the freezing point, 32 degrees Fahrenheit. A farmer wants to know if his land is suitable for growing this crop, so he installs a thermometer to see how cold it gets. He measures five years of data, but his temperature sensor has one drawback: it only measures down to 33 degrees. Any freezing temperature measured is listed as missing data, and excluded from his

[184] Sierra Club Ex. 3, at 31.

> data set. The farmer looks at the data set, and sees that there are 949 hours that were deleted from the data set because his thermometer wasn't sensitive enough to measure freezing temperatures. He shrugs his shoulders and thinks, "oh well, I think I'll be fine." In reality, the farmer is likely to have crop-damaging freezes because he closed his eyes to the information that he really needs to consider. . .
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> * * *
>
> To make matters worse, imagine that the farmer, instead of measuring data at his own field, decided to look at measurements using the same insensitive thermometer, but from a field 60 miles away.

Just as the farmer may easily use an appropriate thermometer capable of recoding below-freezing temperatures, Ms. Sears argues it would be easy to measure wind speeds of less than three knots. And just as the farmer could easily and more accurately record the data on his farm, NRG could record the wind speed data at its Limestone Station. Protestants argue this is precisely what should have been done; and, because it was not, NRG's modeling data is not reliable.

c. NRG's Arguments

NRG responds that it used methods approved by the ED and by EPA for all of its modeling. Responding specifically to allegations that NWS data does not meet with EPA approval, NRG noted the following EPA guidance:

> Although data meeting this guidance are preferred, airport data continue to be acceptable for use in modeling. In fact, observations of cloud cover and ceiling, data which traditionally have been provided by manual observation, are only available routinely in airport data; both of these variables are needed to calculate stability of class using Turner's method (Section 6.4.1).[185]

NRG argues that it properly accounted for calm hours in the modeling but that it was Ms. Sears who varied from the regulatory default options in her effort to show predicted incremental violations. Ms. Sears' testimony asserting that 60 miles, the distance between the Limestone Station property and the Waco airport, was too great for representative use was also

disputed by NRG. On cross-examination, Ms. Sears acknowledged that the meteorological conditions in Santa Barbara County, where she was employed for eight years are affected by mountains, valleys and coastal influences not present in or around the consistent terrain found between the Waco airport and the Limestone Station property.[186]

Given the similar terrain in the central Texas area, NRG finds the NWS data is reliable. NRG insists that the five-year data set that the ED supplied it to use for this modeling is robust and reliable.

d. The ED's Position

Mr. Opiela testified that the NWS data was appropriately relied upon by NRG in its modeling. He arrived at that opinion because the data is complete, quality assured and quality controlled, gathered by a trained professional, and reliable.[187] Therefore, the ED found NRG's use of the Waco airport data to be proper and to result in reliable modeling results.

e. The ALJs' Recommendation

This issue was initially one of the most troubling for the ALJs to evaluate. OPIC's brief is persuasive and there appears to be general agreement that on-site data would be more representative, at least to the extent the number of years spent collecting the data was similar. This fact is effectively argued by Ms. Sears with her farmer analogy. The question then is whether the data relied on from the Waco airport, with all its shortcomings, is sufficiently reliable as an input for the modeling. On this point, the testimony from three qualified experts was markedly different. Dr. Pakrasi and Mr. Opiela found the airport data was adequate, but Ms. Sears vehemently argued it was unacceptable. Ultimately, OPIC found Ms. Sears to be

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[185] Sierra Club Ex. No. 8, at 6-30.

[186] Tr. at 751 and 800.

[187] Tr. at 1042.

more credible and found her challenges to the modeling to have merit. The ALJs disagree and find the testimony of Dr. Pakrasi and Mr. Opiela more persuasive.

Whereas the briefing led the ALJs to initially question the sufficiency of NRG's met data, a close review of Ms. Sears' prefiled testimony reveals an expert who questions the integrity of the Commission as an air-quality regulatory agency, overstates her case with absolutes, and who consequently was found lacking in credibility in comparison to the other experts. For example, concerning the previously discussed 0.6 fugitive adjustment factor, Ms. Sears' opined in her prefiled that, "TCEQ has no basis, evaluation, or evidence to support what is clearly an arbitrary procedure."[188] But in her next answer she contradicted herself, admitting: "Mr. Ruggeri developed his low-level fugitive PM_{10} adjustment factor based on the differences between three-minute to 60-minute average dispersion coefficients." The ALJs are accustomed to experts who choose their words more precisely and who do not overstate their opinions.

Ms. Sears' testimony questioned not only TCEQ technical practices but also its credibility as a regulatory agency: "If TCEQ was truly concerned with verifying complying (sic) with the Clean Air Act, they would be requiring these simple measurements at Limestone 1 and 2 and all such similar facilities."[189] While it is unusual for the ALJs to focus on the tone of an expert's testimony in a PFD, it is brought to the Commission's attention in this instance because it weighed heavily in the ALJs' evaluation of Ms. Sears' credibility. Other statements impacting her credibility as an objective expert include her assertion that TCEQ shows an obvious bias in favor of applicants[190] and that the TCEQ's methods appear to be a deliberate intent to sidestep the most critical air impacts from the proposed project.[191] While Ms. Sears may have legitimate concerns and differences of opinions with other air quality experts, her attacks on the Commission or the ED's motivations tend to lessen her credibility as a reasoned witness.

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[188] Sierra Club Ex. 3, at 22.

[189] Sierra Club Ex. 16, at 44.

[190] Sierra Club Ex. 3, at 8.

[191] Sierra Club Ex. 3, at 8.

On the other hand, Dr. Pakrasi directly contradicted some of Ms. Sears' most damaging assertions, and he demonstrated a firm grasp of the issues when questioned on cross-examination. Dr. Pakrasi is experienced in air quality and PSD reviews in many states, including Virginia, Ohio, Pennsylvania, New Jersey, West Virginia, Delaware, Texas, and New York.[192] While more difficult to ascertain from her resume, it appears Ms. Sears' experience is dominated by activities in one state, California.[193] Whereas Ms. Sears described the Waco airport data as old and of low quality, arguing its use defied logic,[194] Dr. Pakrasi testified that in 16 years of modeling, he has never conducted PSD modeling where the met data set did not come from a NWS site. The ALJs find this to be a significant difference in testimony. Dr. Pakrasi's experiences reveal that the "absolutes" asserted by Ms. Sears are out of touch with ordinary practice. After carefully reviewing the witnesses' breadth of experience as modelers, the ALJs find Dr. Pakrasi to be more credible and, thus, they rely on his testimony to a great deal in making their recommendations.

Dr. Pakrasi approved of the use of the airport data, finding it very representative and reliable of that which would be monitored at the Limestone Station property. His determination was based on numerous factors and comparisons, including his observation that the land use at both sites is rural; that ceiling height and cloud cover would be similar; that wind flow criteria was identical with no topographic features such as mountains, valleys, or coastland; and that the data was gathered for five years, minimizing the impact of any year's worst case meteorological conditions.[195]

Dr. Pakrasi established that the NWS data meets the requirements established in EPA's Met Guidance and testified that NWS data has been used in the processing of numerous other

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[192] NRG Ex. 36.

[193] Sierra Club Ex. 4.

[194] For example, *see* Tr. at 26, where Ms. Sears states, "Since collecting site-specific data is fairly simple option, I have no idea why TCEQ continues an outdated practice that will inevitably lead to flawed air impact analyses."

[195] Tr. at 358-361.

applications that were accepted by both the TCEQ and EPA.[196] Moreover, because the airport data is a five-year data set, it encompasses a more broad range of meteorological conditions that he finds preferable to a one-year data set collected on site as recommended by Sierra Club.

The ALJs also agree with Dr. Pakrasi's findings concerning the lack of data on wind speeds.[197] While it would be ideal to have included wind speeds less than 3 knots (1.54 m/s), the failure to include this information does not render the data inappropriate. Dr. Pakrasi explained that the model automatically designated winds below 1.0 m/s as "calm hours" and then excluded those calm hours from the averaging time for the concentration determinations. These calm hours removed from the model's calculations account for only 2% of the data set. This is significant because the elimination of calm hours lessens the actual number of "missing hours" from the airport data to those with wind speeds from 1.0 to 1.54 m/s (roughly between two and three knots). EPA requires at least 90% data capture for quality purposes. NRG reasons that the hours missed from the lack of collection from 1.0 to 1.54 m/s is less than the calm hours (hours with winds less than 1.0 m/s). Accordingly, even if missing and calm hours are not included, those account for much less than 10% of all hours. Thus, from a regulatory standpoint, the exclusion of those time periods is statistically acceptable (*i.e.*, less than a 10% data loss).[198]

In her modeling, Ms. Sears assumed all calm hours are really hours where the wind blew at 1.0 m/s. Dr. Pakrasi objected to this assumption, noting there is variability in calm hours, so it is improper to use the same number for them.[199] Moreover, during calm hours (those with winds less than 1.0 m/s), he would expect the emissions to simply go high into the atmosphere and then disperse over a more significant area and at less concentrations.[200] This would occur due to the lack of wind blowing emissions down. This opinion supports NRG's contention that Ms. Sears'

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[196] Sierra Club Ex. 8.

[197] NRG Ex. 35, at 33.

[198] Tr. at 362; NRG Ex. 35, at 34.

[199] Tr. at 1117-1118.

[200] Tr. at 268.

modeling over-predicted impacts, and it lessens the argument that an on-site monitor would record higher concentrations than predicted by NRG's modeling. Specifically, Dr. Pakrasi explained that if the plume rises higher into the atmosphere, it will not be recorded by an on-site monitor.

Although Protestants raise many concerns in this area, the bottom line for the ALJs is that both EPA and TCEQ require exclusion of calm hours and disagree with Ms. Sears' assertion that NOCALM is more appropriate for verifying PSD increment and NAAQS compliance than is the regulatory default process of CalmPro.[201] The ALJs further find that the missed hours are from such a small band of wind speed that they do not render the modeling in violation of EPA or TCEQ guidance and would not impact the model so as to significantly bias the results. The testimony of Dr. Pakrasi convinces the ALJs that the five-year NWS data was sufficient and appropriate to use in the modeling performed in support of this application and that the one-year on-site monitoring data urged by Sierra Club and OPIC is unnecessary, if not inferior.

6. Was the Use of Travis County Air Pollution Data Improper and Should NRG be Required to Collect at Least One Year of Air Quality Data From the Limestone Station Property and Re-Assess Air Impacts with this Data.

Sierra Club argues that, by using background concentrations from Travis County monitors, NRG ignored local impacts from the two existing Limestone facility 900 MW boilers. As noted above, Ms. Sears found in her modeling that the two existing boilers alone created a PM_{10} PSD increment violation, so Sierra Club argues that any surrogate monitoring not revealing the same would not be representative of the background concentrations at the Limestone Station.

Another protesting party, CEC, joins in this objection and insists that an air monitor 160 miles away was inappropriately used for background concentrations for the proposed project. CEC maintains NRG failed to follow instructions for surrogate background data given by the TCEQ in a 1998 letter. In that letter, applicants were instructed that, for areas without

[201] Tr. at 362-363.

monitors for background concentration data, they could use only monitored data from an area with about the same or greater emissions and population and with similar topography.[202] CEC contends that the emissions in Travis County are well below those in and around the Limestone Station property. For SO_2 in particular, CEC notes that emissions from existing Limestone boilers alone are twelve times greater than all the Travis County monitored emissions. This was acknowledged by the ED in a 2007 email from former TCEQ employee Kimberly Krause to NRG, where she noted specifically that it was not appropriate to use Travis County monitoring data for SO_2.[203] Because NRG ignored the ED's request for a more representative or conservative background concentration for SO_2, CEC submits that NRG failed to meet its burden of proof and that the application should be denied.

NRG responded that it explained to the ED's satisfaction during technical review that Travis County was a conservative estimate of the ambient background contributions of area and non-point source emissions, because Travis County has a greater population, more vehicle traffic, and greater construction activity than Limestone County.[204] During the hearing, Dr. Pakrasi acknowledged that Limestone County emissions from large point sources are greater than those in Travis County. But he also detailed how these particular large-point-source contributions were added into the model through the PSD background database (PSDB) retrieval system. Dr. Pakrasi testified that, in addition to including all the Limestone County large-point-source emissions, NRG's modeling also included some large point sources that were in the PSDB retrieval but that do not, and will not, exist in fact.

As for concerns over SO_2, Dr. Pakrasi testified that even taking the highest background concentration from any monitor in Texas and adding it to the modeled SO_2 concentrations from

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[202] CEC Ex. 1, Item 3, at 1.

[203] CEC Ex. 1.

[204] Applicant Ex. 35, at 46.

Limestone Unit 3, the application would still demonstrate compliance with the NAAQS.[205] He opined that SO_2 is simply not a concern because of Limestone Unit 3's very low SO_2 emissions.

After considering the evidence and arguments, the ALJs recommend the Commission find the Travis County background data appropriately conservative for modeled conditions at the Limestone Station property. The important factor to keep in mind is that the Travis County data was used only for non-point-source background concentrations (even though it included the non-point- and point-source concentrations for Travis County, adding an additional level of conservative analysis). The point-source concentrations in and around the Limestone Station property and included in the PSDB retrieval were then specifically added into the modeled impacts. The evidence indicates that even some point-source impacts from once-proposed facilities near the Limestone Station were included, even though those facilities will not be constructed.

The ALJs understand that NRG effectively took a very conservative approach by adding worse-than-actual background concentrations from Travis County to worse-than-actual point source concentrations from the nearby area. Accordingly, reliance on the Travis County monitoring data was acceptable. As noted by NRG, the SO_2 impacts from the Limestone Station are such a minor percentage of the overall SO_2 24-hour and 3-hour NAAQS that the SO_2 concerns expressed by Protestants are unfounded.

Concerns expressed by Sierra Club that the 24-hour PM_{10} emissions from Limestone Units 1 and 2 are greater than those included in the PSDB retrieval arise from the PM_{10} modeling performed by Ms. Sears and discussed above. In accordance with EPA guidance, the ALJs have recommended that this modeling and the suggested PSD increment violations be explored and substantiated by the ED before any further action is taken or the SIP is revised. Therefore, this modeling alone does not persuade the ALJs that the Travis County background monitoring data was inappropriately used.

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[205] Tr. 355-356.

7. Is the Additional Modeling of the Proposed Project with AERMOD Flawed?

To alleviate concerns regarding use of the ISCST3 model, NRG also had the data modeled using the AERMOD model. Objections regarding this model are similar—in that the same raw data was relied on, with all the alleged shortcomings noted above by Protestants. In addition, Ms. Sears raised some specific concerns about how the AERMOD modeling was performed. She testified that the inadequacies of using the low quality airport data for the ISCST3 were greatly amplified when used with AERMOD. While admitting that AERMOD contains more advanced dispersion algorithms, she found the adage "garbage in, garbage out" was applicable.[206]

AERMOD uses two meteorological files, one for surface meteorology and one for the dispersion by upper winds in the atmosphere.[207] Sierra Club argues that the airport data used by NRG is insufficiently refined and inadequate (19 to 24 years old) to provide AERMOD with the necessary parameters to satisfactorily run the model. The data only contains surface readings, so AERMOD must use the same values for the surface and upper air profiles, thus invalidating the upper air transport and dispersion necessary to accurately access predicted impacts from the boiler stacks that are more than 500 feet tall. Ms. Sears asserted that, because the Waco airport data was collected at a low surface roughness location, it may only be used as a surrogate for meteorological data at other locations with low surface roughness (flatlands). The Limestone Station was deemed to be of moderate roughness (more trees and buildings); so Ms. Sears urged that the airport data may not appropriately be used in AERMOD.[208]

Mr. Cabe testified on behalf of NRG that, when the AERMOD analysis was run, the same model input files were used as were used by NRG for the ISCST3 modeling runs.

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[206] Sierra Club Ex. 3 at 27.

[207] Tr. at 27.

[208] Sierra Club Ex. 3 at 38. Tr. at 805-808.

However, he explained that the following adjustments to the model input files were made to appropriately manipulate the data for use with the AERMOD:[209]

- They changed the model input emission rates for the low-level fugitive sources by eliminating the 0.6 fugitive emission factor;
- They determined the appropriate "surface roughness" for the Limestone Station and applied that to the meteorological data files;
- They created receptor elevation and "hill height" inputs and applied them to the modeling; and
- They used the AERMOD results with the BPIP Prime program to generate downwash parameters and applied them to the modeling.

In addition, Mr. Cabe made the following changes to AERMOD at NRG's requests:

- the "back-half" (condensable PM_{10}) model input emission rate was added to the analysis;
- receptor grids were included to include receptors on all public highways that crossed the Limestone Property; and
- combined fused and crystalline silica emissions were calculated from the ISCST3 model and then scaled to the PM_{10} fraction for comparison to the TCEQ ESL for PM_{10} silica.

After reviewing the results of the AERMOD runs, Mr. Cabe testified that they generally found lower impacts than those predicted by the ISCST3 model. In particular, the AERMOD predicted lower PM_{10} incremental consumption than did the ISCST3, for both the 24-hour and annual increment.[210] Mr. Cabe concluded that the modeling performed was accurate, valid, and appropriate for demonstrating compliance with all air quality standards and guidelines. He found that the AERMOD modeling sufficiently demonstrated the proposed project will neither cause nor contribute to a condition of air pollution.

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[209] NRG Ex. 54, at 20-21.

[210] NRG Ex. 54, at 24.

After reviewing the evidence, the ALJs find the AERMOD runs to be a conservative and sufficient prediction of air quality impacts surrounding Limestone Unit 3. While Ms. Sears would prohibit the use of NWS data at medium to high surface roughness sites, Dr. Pakrasi testified he has used it extensively when modeling with AERMOD.[211] Mr. Cabe noted that numerous conservative factors were included in the modeling. These included:

- consideration of emissions from once-proposed sources in the area that have now been withdrawn from the application process;
- double counting existing source inputs (they were included in the background concentrations which were added to the AERMOD modeling);
- unrealistically considering the maximum rate of emissions from all sources with the worst-case dispersion conditions; and
- modeling all NRG sources and hundreds of existing and proposed sources from other facilities included in the offsite point source database as emitting their maximum allowable emission rates at the same time.

Mr. Opiela testified that the EPA has recognized the ability to use NWS data when running AERMOD and that the ED has provided met data files for use with this model.[212] He explained that the raw met data is adjusted by inputs suggesting a low, medium, or high roughness for preprocessing before the final met data is ready for input into AERMOD. The ED performed that preprocessing step for the Waco NWS data used by NRG. Thus, the met data was preprocessed for the medium roughness at Limestone Station and was appropriately used in AERMOD. The ALJs conclude that the AERMOD modeling runs, as conducted by NRG, met or exceeded the minimum modeling standards imposed by the TCEQ and the EPA.

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[211] Tr. at 363.

[212] Tr. at 993-996.

8. Air Quality Summary

Protestants claim that by correcting even just one of the PM_{10} "modeling biases" noted above, there is a PSD increment violation. They assert that the poor quality of the meteorological data and the treatment of "calm hours" is further proof that NRG has not met its burden of proof. Protestants insist that on-site monitoring of air quality and for meteorological data is necessary before this permit may be issued. On-site post-construction monitoring for PM is also alleged to be necessary due to the evidence suggesting the PSD increment for PM_{10} is already being exceeded. Citing to portions of the federal CAA, Sierra Club opines that NRG's preconstruction PSD review must have included an analysis of ambient air quality at the proposed site and must have included continuous air quality monitoring data gathered to determine whether emissions from the facility will exceed the maximum allowable increases or maximum allowable concentration.[213] Protestants urge a finding that NRG failed to meet it burden under both the Federal and Texas Clean Air Acts.

The ALJ understand there is always a bar that may be raised or lowered on what is considered to be acceptable modeling practices. Ms. Sears' bar is very high, much higher than that required by the TCEQ or EPA. However, applicants are to be held to the bar established by the regulatory agencies. The modeling performed by NRG is reasonably performed and predicts that the proposed project will not cause or contribute to a condition of air pollution. Even the PM_{10} modeling for Limestone Units 1 and 2 performed by Ms. Sears, but using NRG's data and modeling, did not rise to the level suggesting a finding of a PSD increment violation. As noted above, the modeling performed contained conservative inputs that should be refined when a violation is initially predicted to truly determine if the concentrations suggested are likely. Performing that type of refined modeling would be one possible next step in carrying out the Commission's duty to substantiate the predicted violations and, if they still appear to exist, to then correct them in the SIP. However, as noted above, because PM_{10} emissions from Limestone

[213] Clean Air Act Section 165(e)(1)and (2), 42 U.S.C. §7475(e)(1)and(2).

Unit No. 3 are below the SIL at the points of concern, this permit still may be issued even if alleged violations were modeled.

D. NAAQS for Ozone

Protestants contend that NRG failed to fully demonstrate that its proposed emissions will comply with the NAAQS for ozone. RCOLOL contends that Limestone Unit 3 will contribute air pollution that will increase the concentration of ground level ozone in Ellis County, a downwind air quality control region classified as nonattainment for the 8-hour ozone NAAQS. RCOLOL argues this contribution will be in violation of the federal CAA's PSD permitting program, adopted by the TCEQ, which requires a demonstration that emissions will not cause or contribute to air pollution in excess of any NAAQS.[214] RCOLOL interprets this statute to mandate a finding of contribution to air pollution and a violation of ozone NAAQS for *any* emissions amount in a non-attainment area, because any amount is deemed to "contribute" to air pollution if the area is already out of attainment.

The dispute arises over whether a *de minimis* level exists at which predicted impacts for ozone are measureable but insignificant. On NRG's behalf, Dr. Thomas Tesche conducted a photochemical modeling analysis of the Limestone Unit 3 Project's ozone impacts He found a modeled ozone impact of 0.07 parts per billion (ppb) at the Midlothian monitor in Ellis County. NRG argues that this is an infinitesimally small impact that the Commission has already found in previous decisions to be *de minimis* and not at a level to be considered a contribution to air pollution.[215] Moreover, NRG urges that the Commission's determination in at least one case, Sandy Creek, was recently upheld by the Amarillo Court of Appeals which found:

> Thus, because both the federal and state interpretation of the "cause or contribute to" standard will tolerate some insignificant level of contribution to a downwind NAAQS ozone exceedance, we overrule TPOWER's issue to the extent that it contends that an

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[214] 42 U.S.C. § 7475(a)(3)(B).

[215] NRG Ex. 84 at 12-13; NRG Ex. 83 at 12.

application must be denied or that an offset must be obtained when any downwind contribution is made to a NAAQS ozone exceedance.[216]

NRG further argues that if Dr. Tesche had performed his photochemical modeling after NRG committed to no net increase in emissions, his analysis would have found no ozone impact from the Limestone Unit 3 Project.[217] NRG maintains that the Commission's prior determinations lead to a conclusion that the Limestone Unit 3 Project will not "cause or contribute" to ozone nonattainment in Ellis County.

RCOLOL disagrees, arguing that the Commission does not have the authority to create a *de minimis* level for ozone, as that authority rests solely with EPA—which has declined to so act. While EPA designated *de minimis* levels for criteria pollutants, RCOLOL notes that EPA has declined to specify such levels for the photochemical oxidants VOCs and NO_x which form ozone. RCOLOL acknowledges that past Commission decisions have disagreed with its position but urges the ALJs not to perform "TCEQ's bidding and violate the law" in the PFD.[218]

The ALJs' role is to make findings of fact and to apply the law—including policies adopted by the Commissioners. The maximum potential contribution of ozone from Limestone Unit 3 to the DFW nonattainment area is 0.07 ppb, which is less than one-tenth of one percent of the present regulatory standard of 0.075 parts per million. Past Commission decisions have found that small of an amount to be insignificant and *de minimis,* and that conclusion has been upheld on appeal. The ALJs are bound to follow that policy and, thus, conclude that Limestone Unit 3 will not cause or contribute to air pollution in excess of the ozone NAAQS.

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[216] *Blue Skies Alliance v. Tex. Comm'n on Environmental Quality*, No. 07-07-0306-CV, 2009 Tex. App. LEXIS 2534 (April 14, 2009).

[217] Tr. at 555.

[218] RCOLOL's Response to Closing Arguments, at 6.

E. MACT Analysis

1. Background

As noted briefly in the first pages of this PFD, a court decision that occurred during the pendency of the state air quality/PSD permit application required NRG to conduct a case-by-case maximum achievable control technology (MACT) evaluation in this case, which resulted in a separate application being filed for draft permit HAP-14. That application was docketed as a separate case, but was then consolidated with the state air quality/PSD permit application for hearing and issuance of this PFD. This section addresses the issues raised by that separate application.

Prior to March 2008, the EPA had adopted a Clean Air Mercury Rule (CAMR) and delisted coal-fired power plants from the case-by-case MACT requirements. But, in March 2008, the D.C. Circuit Court of Appeals vacated EPA's CAMR and delisting, effectively requiring a MACT determination in cases like this involving coal-fired power plants. Accordingly, NRG prepared a MACT application seeking an additional permit, HAP-14, that would establish federally enforceable MACT emission limits for several pollutants, including mercury, for the Limestone Unit 3 main boiler and auxiliary boiler (the auxiliary boiler is a separate source from the Limestone Unit 3 main boiler and is not a major source by itself). The MACT application was reviewed and determined to be administratively and technically complete by the ED on July 18, 2008.

2. MACT Analysis Overview

Like BACT, MACT is designed to be technology-forcing, to ensure that new technologies are utilized to obtain the lowest achievable emissions of pollutants in newly-issued permits. Both the EPA and the TCEQ have provided a definition for MACT emissions limits in their rules. Specifically, 40 C.F.R. § 63.41 provides:

> *Maximum achievable control technology (MACT) emission limitation* for new sources means the **emission limitation** which is **not less stringent** than the **emission limitation achieved in practice** by the **best controlled similar source**, and which reflects the **maximum degree of reduction in emissions** that the permitting authority, taking into consideration the **cost of achieving such emission reduction**, and **any non-air quality health and environmental impacts** and **energy requirements**, determines is **achievable** by the constructed or reconstructed major source.[219]

In this case, NRG performed a two-step process for conducting its MACT analysis. First, NRG established a "MACT floor" (the most stringent emission limitation achieved in practice by the best controlled similar source). Then, NRG performed a "beyond the floor" analysis of other methods for potentially reducing emissions to a greater degree, considering all applicable factors, such as the cost of achieving such emissions reductions and associated energy requirements.[220]

NRG asserts that Limestone Unit 3 will emit only four classes of hazardous air pollutants (HAPs): mercury; non-mercury HAP metals; acid gases, comprising HCl and HF; and organic HAPs.[221] Therefore, in its MACT application, NRG developed emissions limits for only five pollutants, contending that two of these pollutants serve as surrogates for broad categories of pollutants. The five specific emissions limits proposed in the MACT application are for:

- CO;
- filterable PM;
- mercury;
- HF; and
- HCl.[222]

NRG contends that CO is an adequate surrogate for organic HAPs, so the CO emissions limit will serve to ensure that MACT emission limits for organic HAPs will be met. Further, NRG contends that filterable PM is an adequate surrogate for non-mercury metal HAPs, and the

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[219] The TCEQ's definition is found at 30 TEX. ADMIN. CODE § 116.15 and mirrors the EPA's definition.

[220] NRG Ex. 7, at 53.

[221] NRG Ex. 7; NRG Ex. 71, at 15.

[222] See charts on p. 18 of this PFD for the specific emissions limits proposed.

filterable PM emissions limit will ensure that MACT emission limits for non-mercury metal HAPs will be met.

3. Alleged Flaws in NRG's MACT Analysis

Protestants challenge NRG's MACT analysis on numerous grounds. First, they allege that NRG did not consider all of the applicable HAPs set out in the federal CAA. Moreover, they contend that NRG improperly used surrogates for certain HAPs, when it should have conducted a separate analysis for the specific HAPs. They also contend that NRG's failure to identify the control technology it will use for controlling mercury emissions is a fatal flaw in its MACT analysis. Protestants dispute that the emissions limit proposed for mercury is actually MACT, instead arguing that at least one other existing permit has a lower limit for mercury. Part of the reason for this, according to Protestants, is that NRG used too limited a group of "similar sources" in trying to determine the MACT floor. Thus, it failed to properly consider other similar sources. Finally, Protestants argue that the ED's evaluation of NRG's MACT application was wholly deficient. Each of these arguments is discussed below, along with NRG's response and the ALJs' analysis.

a. Was the TCEQ Staff's Review of NRG's MACT Application Sufficient?

Protestants challenge the TCEQ staff's review of NRG's MACT application, contending that it was deficient and really amounted to no substantive review at all. Protestants cite to the following testimony of Mr. Linville, the MACT application reviewer for the TCEQ, as exhibiting the cursory review given by TCEQ staff:

Q: Go ahead and step us through the process that you undertook in conducting the MACT review. You got the application. What did you do first?

A: Read through the application.

> Q: Okay. What's next?
>
> A: Then I go back and read it again and evaluate the notes I had made to make sure that – often a note is answered later in the application. And then I did a few searches on the internet to see if I can find anything else that was out there on the MACT review, and I didn't find anything that appeared to be relevant to what I was doing. So I was – I had to rely predominantly on what they provided, and I could not find any reason not to agree with what they submitted.[223]

Moreover, Mr. Linville admitted this was the first case-by-case MACT application he had reviewed, and he conceded that he did not contact any other states' permitting agencies to see how they handled MACT application reviews, nor did he have anyone conduct any research on MACT reviews, nor did he look at any other MACT reviews for guidance.[224] Finally, Protestants note that Mr. Linville did not keep any of his notes, so they were unable to examine the thoroughness of his "review." However, based upon Mr. Linville's testimony, Protestants allege that the record amply demonstrates that the TCEQ did not conduct any thorough MACT review. Instead, it simply relied on what was submitted by NRG in its application.

NRG and the ED disagree with Protestants' assessment, and argue that TCEQ staff's review of the MACT application was sufficient. They point out that Mr. Linville has over 20 years experience in air permitting, and he has experience in evaluating control technology for coal-fired boilers. His analysis in this case included a review of the EPA's RACT/BACT/LAER Clearinghouse and "any other permits [he] was aware of or other permitting activity that [he] could find."[225] According to NRG, the TCEQ's staff cannot be faulted for the fact that this was the first MACT application in Texas for a coal-fired boiler, or for the fact that the MACT application contained enough detailed information to make the TCEQ staff's job simpler.

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[223] Sierra Club Ex. 40, at 97.

[224] Tr. at 907-908.

[225] Tr. at 959; ED Ex. 1, at 20.

Further, NRG points out that Protestants have not identified any specific required action that TCEQ staff failed to do; nor procedures required by guidance or rule that TCEQ staff failed to satisfy. Accordingly, NRG and the ED argue that any challenge to the sufficiency of the TCEQ's review of the MACT application has no foundation and should be dismissed.

Although the TCEQ staff's review of the MACT application does not appear to have been very rigorous, the ALJs also do not find any specific failings in it. As NRG notes, Protestants have not identified any required actions or procedures that TCEQ staff failed to perform. Rather, Protestants' challenge is simply to the cursory nature of the TCEQ staff's review. That alone, though, is not a ground for finding the MACT application deficient or for denying it. Rather, to the extent that the MACT application contained enough information for a proper analysis, the TCEQ staff's verification of that information and reference to outside sources to confirm there were no changes to existing data or technology was sufficient for purposes of the MACT analysis. That is what was done in this case and the ALJs conclude it was adequate.

b. Were all Necessary HAPs Considered?

Protestants contend that NRG's MACT analysis failed to properly include all HAPs anticipated to be emitted from Limestone Unit 3. For example, Sierra Club's expert, Dr. Sahu, asserts that compounds such as dioxins and radionuclides were not included in NRG's MACT analysis, nor have specific organic HAPs been identified by NRG. Rather, NRG simply included the broad category of "organic HAPs" without listing and identifying all HAPs to be considered. Further, Dr. Sahu notes that NRG's Emission Point Summary does not identify selenium as a HAP to be emitted.

NRG disputes Protestants' contention, and asserts that it did properly consider all applicable HAPs. NRG points to the testimony of Mr. Campbell, who testified that all of the HAPs listed under Section 112 of the federal CAA were considered by him in his MACT analysis. When pressed on this, he affirmed that "every single one of the 180 some odd

pollutants on [the EPA's Section 112 list] were included" in his analysis.[226] However, NRG concedes that not all of the 188 HAPS listed in Section 112 were specifically named in the MACT application. Rather, as Mr. Campbell testified, the list of pollutants specifically identified in the MACT application are those that would be relevant for the TCEQ to evaluate and establish MACT limits for the type of facility—a coal-fired boiler—in issue in this case.

The ALJs ultimately find Protestants' concern to be a non-issue. Mr. Campbell's testimony clearly indicates that all required HAPs were considered in the MACT analysis. Dioxins were considered in the analysis of organic HAPs and radionuclides were considered among non-mercury metal HAPs.[227] However, the ALJs agree with Protestants that it would be better if the MACT application contained more detailed information regarding the consideration of those HAPs, so that the ALJs and the Commission could see the extent of that consideration.

But, any dispute over the amount of "analysis" of HAPs by NRG is really subsumed within the bigger issue—namely, whether the emissions limits proposed represent MACT for the HAPs to be emitted by Limestone Unit 3. The reason for considering HAPs is to develop emissions limits and controls for emissions that are protective of human health and the environment. Thus, as long as NRG has proposed emissions limits that reflect MACT for the applicable HAPs to be emitted, the extent of NRG's analysis of the different HAPs is inconsequential—except to the extent that it reflects upon whether the proposed emissions limits can be said to genuinely reflect MACT.

Because NRG has proposed only five emissions limits, what is actually significant is NRG's proposed use of surrogates for the HAPs expected to be emitted from Limestone Unit 3. This issue is addressed by the ALJs next. Therefore, the ALJs find that the extent of NRG's consideration of the HAPs identified in Section 112 of the federal CAA is not a basis for finding the MACT application inadequate. Rather, the ALJs turn to NRG's proposed use of surrogates

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[226] Tr. at 574.

[227] NRG Ex. 71, at 20; Tr. at 601.

for determining MACT emissions limits for the HAPs expected to be emitted from Limestone Unit 3, to see whether NRG has properly proposed MACT limits for all applicable HAPs.

c. Is the Use of Surrogates for other HAPs Proper in this Case and are the Emissions Limits Proposed Truly Representative of MACT?

NRG uses CO is a surrogate for organic HAPs and asserts the CO emissions limit will ensure that MACT emission limits for organic HAPs will be met. Further, NRG uses filterable PM as a surrogate for non-mercury metal HAPs and asserts the filterable PM emissions limit will ensure that MACT emission limits for non-mercury metal HAPs will be met. Sierra Club's expert, Dr. Sahu, disagrees with this approach and contends that NRG's groupings and use of surrogates are arbitrary and do not adequately represent the characteristics of the HAPs in issue. Thus, he contends that the surrogates chosen will not always fairly represent the HAPs to be represented.

For example, Dr. Sahu notes that NRG has grouped dioxins under the "organic HAPs" category, which also includes benzene. But he contends that that the formation mechanisms and fate of dioxins after leaving the boiler are very different than for benzene. Dr. Sahu alleges that this is representative of NRG's failure to explain how the behavior of the pollutants listed under "organic HAPs" is similar—from either a formation or control standpoint.[228]

Similarly, Dr. Sahu disagrees with NRG's decision to group all non-mercury metals and represent them by particulate matter. He points out that the EPA has identified four different classes of metals, and he argues, for example, that selenium should be grouped with mercury rather than under particulate matter, based upon the volatility of the metals. In fact, Dr. Sahu goes further and contends that there should be entirely separate MACT limits for both selenium and arsenic, based upon their characteristics. He also contends that most metal HAPs partition into the fine particulate range (*i.e.*, in the range of $PM_{2.5}$, rather than in the larger PM_{10} range), and that the best controls for $PM_{2.5}$ are different than the best controls for PM_{10} or filterable PM

generally. Thus, while he agrees that $PM_{2.5}$ might be a fair surrogate for many of the non-volatile metal HAPs, PM_{10} or PM in general is not.[229] For these reasons, Dr. Sahu disputes that NRG's use of surrogates was shown to be proper.

NRG's experts disagree with Dr. Sahu's assertions. First, NRG cites to EPA precedent showing the use of surrogates is acceptable, especially the use of CO as a surrogate for organic HAPs. In particular, EPA has stated:

> Because CO is a good indicator of incomplete combustion, there is a direct correlation between CO emissions and the formation of organic HAP emissions. Monitoring equipment for CO is readily available, which is not the case for organic HAP. Also, it is significantly easier and less expensive to measure and monitor CO emissions than to measure and monitor emissions of each individual organic HAP. Therefore, using CO as a surrogate for organic HAP is a reasonable approach because minimizing CO emissions will result in minimizing organic HAP emissions.[230]

Mr. Campbell testified that the use of CO as a surrogate for organic HAPs is an established practice—accepted by EPA—in MACT applications.[231]

NRG concedes that there may be varying differences between specific HAPs, but overall each of the grouped organic HAPs have sufficient similarity with the surrogate, CO, to justify the grouping. For example, while dioxin and benzene will have some differences, dioxin is formed and behaves similarly to CO in a boiler situation and the same good combustion practices that control CO emissions will similarly control dioxin.[232] Further, Mr. Campbell testified that even when the EPA has set emissions limits for specific organic compounds, they frequently use other

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[228] Sierra Club Ex. 15, at 70.

[229] Sierra Club Ex. 15, at 72.

[230] 69 Fed. Reg. 55,218 (September 13, 2004).

[231] NRG Ex. 71, at 23.

[232] Tr. at 601. The terms "dioxin" and "dioxins" are used interchangeably in this PFD and the evidence to refer to the same group of pollutants.

surrogates (like CO) to measure compliance with the emissions standard.[233] Therefore, NRG contends that the use of CO as a surrogate for organic HAPS is clearly justified.

Similarly, NRG alleges the use of filterable PM as the surrogate for non-mercury metal HAPs is justified, because non-mercury metal HAPs are a constituent of the fuel and are emitted largely in the form of fly ash—which is filterable PM. NRG cites to the EPA's determination to allow PM to be used as a surrogate for non-mercury metal HAPs. Specifically, the EPA stated:

> The particulate matter standard is a necessary, effective, and appropriate surrogate to control nonmercury metal HAPs. The record demonstrates overwhelmingly that when a hazardous waste combuster emits particulate matter, it emits nonmercury HAP metals as part of that particulate matter, and that when that particulate matter is removed from emissions the nonmercury metal HAPs are removed with it.[234]

The EPA then stated that this was "equally true for any emitting source, not just hazardous waste combusters."[235] Therefore, NRG contends that its decision to use filterable PM as a surrogate for non-mercury metal HAPs is supported by clear EPA practice and precedent.

NRG further substantiates the use of surrogates like CO and filterable PM for other reasons. For example, in determining MACT emissions standards, there must be sufficient data from which to draw conclusions as to what is truly achievable in practice. However, for many of the HAPs that fall under the surrogate categories, there is little data from which to draw. As Mr. Campbell testified, "nearly all sources have numerical limits on CO and filterable PM emissions and there exist repositories of such data" (such as the EPA's RACT/BACT/LAER Clearinghouse), but "far fewer sources, however, have the kinds of numerical limits on trace HAP species that can inform such control technology determinations."[236] Thus, the absence of data on trace HAPs also supports the use of a surrogate like CO or filterable PM.

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[233] Tr. at 602-603.

[234] NRG Ex. 78 (70 Fed. Reg. 59459).

[235] NRG Ex. 78 (70 Fed. Reg. 59459, at fn. 130).

[236] NRG Ex. 71, at 16.

However, for two primary reasons, NRG disagrees with Dr. Sahu's assertion that $PM_{2.5}$ can serve as an effective surrogate for non-mercury metal HAPs. First, a substantial portion of metals emissions will be part of or absorbed onto fly ash that is greater than 2.5 microns. Second, there currently exists a lack of data and a test referencing method for accurately addressing $PM_{2.5}$ emissions.[237] In fact, this is one the reasons that PM_{10} is currently allowed as a surrogate for $PM_{2.5}$. Based on these two reasons, NRG argues that filterable PM, rather than $PM_{2.5}$, is the appropriate surrogate for non-mercury metals.

After considering the evidence and arguments, the ALJs conclude that NRG's use of surrogates is appropriate, and that NRG's MACT demonstrations—except in regard to mercury, which is discussed below—satisfy applicable requirements and establish proper MACT emissions limits.

Although Dr. Sahu presents some questions as to NRG's use of surrogates, his testimony is persuasively rebutted by Mr. Campbell's testimony. As importantly, the EPA has sanctioned the use of CO and filterable PM as surrogates in the past, using the same surrogate groupings that NRG proposes in this case (*i.e.*, allowing CO as a surrogate for organic HAPs, and filterable PM as a surrogate for non-mercury metal HAPs). The ALJs find Mr. Campbell's reasoning—as well as that presented by the EPA—to be persuasive and justify the use of surrogates in the manner proposed by NRG.

As to the specific emissions limits, those proposed for CO, filterable PM, and mercury are addressed elsewhere in this PFD. The emissions limits proposed for HF (0.0005 lb/MMBtu) and HCl (0.0023 lb/MMBtu) have not been seriously challenged, and the ALJs find that the preponderance of the evidence supports the finding that they are MACT.

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[237] Tr. at 585-586.

d. Is NRG Required to Identify a Mercury Control Technology?

Protestants contend that NRG's MACT analysis fails in regard to mercury because NRG has not proposed a specific control technology to be used for mercury emissions. Instead, NRG proposes a MACT emissions limit, and indicates that it will utilize the best technology suitable to ensure that limit is met. Protestants contend that this does not comply with state and federal case-by-case MACT requirements.

In support of their contention, Protestants point to 40 C.F.R. § 63.43(e), entitled "Application requirements for a case-by-case MACT determination," which states:

> (1) An application for a MACT determination . . . shall specify a control technology selected by the owner or operator that, if properly operated and maintained, will meet the MACT emission limitation. . . .

Further, Protestants cite to 40 C.F.R. § 63.43(e)(2), which lists the specific items of information to be included in the MACT application. Among other things, that rule requires that an application for a MACT determination shall contain the following:

> (xi) The selected control technology to meet the recommended MACT emission limitation, including technical information on the design, operation, size, estimated control efficiency of the control technology . . .
>
> (xii) Supporting documentation including identification of alternative control technologies considered by the applicant to meet the emission limitation, and analysis of cost and non-air quality health environmental impacts or energy requirements for the selected control technology.[238]

Based on these requirements, Protestants contend it is undisputed that NRG's MACT application is required to specify the control technology to be used. Because NRG allegedly failed to do this in regard to mercury, Protestants urge that its MACT application is inadequate.

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[238] 40 C.F.R. § 63.43(e)(2)(xi)-(xii).

NRG argues that it has adequately identified its intended control technology. While it acknowledges that it has left itself some discretion in the specific technology used once Limestone Unit 3 comes online, it still argues that the emissions control technologies identified in its application are sufficient to meet the applicable MACT requirements.

Specifically, NRG notes that its MACT application identifies its intended control technology as "a low-NO_x combustion system, a selective catalytic reduction (SCR) system, a wet Flue Gas Desulfurization (wet FGD) system using limestone as the scrubber agent, sorbent injection or other effective mercury control, and a fabric filter."[239] NRG contends that this is a sufficient identification, in light of the fact that the MACT analysis is intended to focus on the emissions limits achievable, not the specific technology used.

Moreover, NRG asserts it is not required to provide the information identified in 40 C.F.R. § 63.43(e)(2)(xi)-(xii). In this regard, NRG relies on 40 C.F.R. § 63.43(e)(3), which states:

> (3) In each instance where the owner or operator contends that a constructed or reconstructed major source will be in compliance, upon startup, with case-by-case MACT under this subpart without a change in control technology, the application for a MACT determination shall contain the following information:
>
> > (i) The information described in paragraphs (e)(2)(i) through (e)(2)(x) of this section; and
> >
> > (ii) Documentation of the control technology in place.

NRG asserts that the MACT application does not require any new emission controls than those otherwise previously identified in the state air quality/PSD permit application. Therefore, NRG contends that 40 C.F.R. § 63.43(e)(3) applies and, by its terms, the information identified under 40 C.F.R. § 63.43(e)(2)(xi)-(xii) is not required.

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[239] NRG Ex. 7, at 18.

Finally, NRG indicates that the field of mercury control is rapidly developing and, therefore, it is better for NRG to have flexibility in its choice of mercury controls to enable it to use the best technology available at the time Limestone Unit 3 is built. While arguing that the "installation of sorbent injection or other effective mercury control" is an enforceable permit representation, NRG seeks to be given "the flexibility to employ the most cost-effective and efficient mercury controls at the time that it establishes the final technical specifications for Limestone Unit 3."[240]

The ALJs are concerned regarding the lack of sufficiency of NRG's MACT showing in regard to the control technology to be used for mercury emissions. While the ALJs understand NRG's position that the emissions limit is the primary focus of the MACT analysis and it is better to have flexibility to implement the most up-to-date technology available, the ALJs are also constrained to apply the clear wording of the applicable MACT rules, and those rules appear to require more specificity in the selected mercury control technology than that currently provided by NRG.

The ALJs believe that 40 C.F.R. § 63.43(e)(3)—which would relieve NRG from the responsibility of satisfying the more detailed identification of control technologies required by 40 C.F.R. § 63.43(e)(2)(xi)-(xii)—does not apply to NRG's MACT application. By its own language, Section 63.43(e)(3) applies when "a constructed or reconstructed major source will be in compliance, upon startup, with case-by-case MACT under this subpart without a change in control technology." In this case, NRG's original state air quality/PSD application did not specify a definitive control technology for mercury control. Where no definitive technology has been proposed originally, it is not reasonable to say that "no change" will be required. In fact, a change will be required because NRG will eventually have to specify a control technology.

Moreover, the ALJs believe that the language of 40 C.F.R. § 63.43(e)(3) is intended to apply when, by operation or previous demonstration, an applicant has previously shown its

[240] NRG's Brief in Reply to Closing Arguments, at 49.

control technology will meet the applicable limits. This is shown by the fact that, under 40 C.F.R. § 63.43(e)(3)(ii), the applicant is still required to show "documentation of the control technology in place"—namely, the technology that is allegedly sufficient to establish compliance.

Further, NRG's own MACT application evidence appears to contradict its arguments—because its own application cites to the requirements of 40 C.F.R. § 63.43(e)(2)(xi)-(xii) as being part of the applicable MACT analysis, thus implying that those provisions apply. Specifically, in identifying and discussing the information required for the MACT analysis, NRG's application indicates the following information is required:

- The control technology to meet the recommended MACT emission limitation, including technical information on the design, operation, size, and estimated control efficiency of each control technology.

- Supporting documentation including identification of alternative control technologies considered by the applicant to meet the emission limitation, and analysis of cost and non-air quality health environmental impacts or energy requirements for the selected control technology.[241]

Right after indicating that information is necessary, NRG's application goes on to state that "Information concerning the recommended MACT emissions limitation and control technology for the PC boiler and auxiliary boiler is found in Section X.F of today's application."[242] Therefore, it seems odd that NRG's application indicates that information is necessary and that such information has been provided, but then later contends in its arguments that information is not required. Accordingly, it appears to the ALJs that the provisions of 40 C.F.R. § 63.43(e)(2)(xi)-(xii) requiring a detailed showing of the control technology to be used would apply to NRG's MACT application.

[241] NRG Ex. 7, at 52. This language mirrors that found in 40 C.F.R. § 63.43(e)(2)(xi)-(xii)—which NRG now contends does not apply.

[242] NRG Ex. 7, at 53.

But regardless of whether 40 C.F.R. § 63.43(e)(2)(xi)-(xii) apply, other portions of the federal regulations do apply and require NRG to "specify a control technology selected by the owner or operator that, if properly operated and maintained, will meet the MACT emission limitation."[243] This language appears to require that the intended control technology must be identified and shown to be capable of meeting the emissions limitation.

The evidence in this case establishes that NRG has not determined a control technology it will use for mercury emissions at Limestone Unit 3. The application itself references "sorbent injection or other effective mercury control." However, this is relatively broad and does not actually specify the intended control technology for mercury emissions. And, when questioned on this, NRG's witnesses consistently conceded the mercury controls had not been established.

When questioned, Ben Carmine (NRG's director of environmental operations) testified to the following:

> Q: Would I be correct in stating that you have not identified one specific mercury control technology that you intend to install at Limestone Unit 3?
>
> A: You would be correct.
>
> Q: As director of environmental operations, have you selected a mercury control technology for Unit 3 yet?
>
> A: Mercury control technology has not been selected yet for Unit 3.[244]

Similarly, Mr. Cabe (who was in charge of preparing NRG's MACT analysis) testified:

> Q: So does Mr. Campbell have an answer for what control technology will be used for mercury control in the final plant?
>
> A: We haven't proposed a technology. . . .

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[243] 40 C.F.R. § 63.43(e)(1).

[244] Tr. at 72.

* * *

Q: When I say "proposed," I mean that the Applicant has not made a decision or told TCEQ, the judges or anybody else in this room what control technology they will use?

A: I don't believe that's been proposed.[245]

Another of NRG's MACT experts, Mr. Campbell, testified similarly, admitting that he could not identify what technology would be used to control mercury emissions from Limestone Unit 3. He further testified that NRG was under no obligation to identify any control technologies, because the MACT analysis is an emissions limitation and it is inappropriate for agencies to focus on the technology used to achieve the limit.[246]

Therefore, it is abundantly clear that NRG has not specified the control technology to be used for controlling mercury emissions at Limestone Unit 3. In fact, NRG's experts do not think that requirement even exists. While their interpretation may ultimately be how the TCEQ wishes to interpret the applicable MACT rules, the ALJs are constrained to follow the plain wording of those rules, which clearly state that the applicant must "specify a control technology selected by the owner or operator that, if properly operated and maintained, will meet the MACT emission limitation." This language requires the applicant to specify a control technology that has been selected by the owner or operator of the facility.

While one could argue that this rule merely requires an applicant to show that technology exists to meet the applicable MACT requirements, such an interpretation would still appear to require the applicant to choose one technology (*i.e.*, "a control technology that has been selected by the owner") and demonstrate how it will allow the MACT emissions limits to be satisfied. In this case, NRG has not done this. Instead, NRG has merely indicated that "sorbent injection or other effective mercury control" will be used to meet the MACT emissions limit that NRG

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[245] Tr. at 474-475.

[246] Tr. at 604-611.

proposes. The ALJs do not believe that this satisfies the requirements of the MACT rules. And it certainly does not satisfy the requirements of 40 C.F.R. § 63.43(e)(2)(xi)-(xii), which requires "technical information on the design, operation, size, estimated control efficiency of the control technology" and supporting documentation including "identification of alternative control technologies considered by the applicant to meet the emission limitation, and analysis of cost and non-air quality health environmental impacts or energy requirements for the selected control technology."

For these reasons, the ALJs conclude that NRG's MACT demonstration in regard to mercury emissions does not satisfy the applicable MACT rules. Accordingly, the ALJs recommend the Commission remand the application for technical review for further MACT analysis and demonstrations or, alternatively, deny the MACT application.[247]

e. Did NRG use a Proper Group of Similar Sources and are NRG's Proposed Mercury Emission Limits Actually MACT?

NRG has proposed sliding scale mercury emission limits of between 0.012 lb/GWh and 0.015 lb/GWh (12-month rolling average) for Limestone Unit 3, depending on the fuel mix burned. For example, if only sub-bituminous coal is used, then the output-based mercury emissions limit would be equal to 0.015 lb/GWh. If an 80/20 blend of sub-bituminous and bituminous coals is used, then the output-based mercury emissions limit would be equal to 0.0135 lb/GWh. If a 60/40 blend of sub-bituminous and bituminous coals is used, then the output-based mercury emissions limit would be equal to 0.012 lb/GWh.

In reaching its proposed MACT limits for mercury, NRG relied on an analysis of "similar sources" as required by the MACT rules. But, in regard to mercury, NRG chose to define similar sources as including "all PC boilers burning sub-bituminous coal or blends of primarily sub-bituminous coal and lesser amounts of petroleum coke or bituminous coal."[248]

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[247] See, TEX. HEALTH & SAFETY CODE § 382.0518(d) and (e), and footnote two in this PFD.

[248] NRG Ex. 7, at 54.

Protestants argue that NRG's definition of similar sources is too limited, in light of the regulatory definition of "similar source" for MACT purposes, which is:

> [A] stationary source or process that has comparable emissions and is structurally similar in design and capacity to a constructed or reconstructed major source such that the source could be controlled using the same control technology.[249]

Based upon this definition, Protestants argue that a similar source need only have comparable emissions that can be controlled using the same control technology. Thus, Protestants assert that all coal-fired boilers should have been considered within the realm of similar sources—regardless of fuel type—because the method of controlling mercury will rely on similar technology (such as sorbent injection), even if the achievable control efficiency may vary based upon the fuel blend used.

With this in mind, Protestants contend that NRG's proposed sliding scale does not represent MACT for mercury, citing to a permit issued for three bituminous coal-fired units at Brayton Point Station, Massachusetts (Brayton Point). The Brayton Point facility has an emission limit of 0.0075 lb/GWh (12-month rolling average) for mercury.[250] Protestants contend that this emissions limit represents the true MACT for mercury emissions.

In response, NRG does not really address Protestants' contention about similar sources, simply dismissing it without giving any substantive justification. But NRG does address Protestants' assertion regarding the similarity of the Brayton Point facility, pointing out that the Brayton Point units burn only bituminous coal, which allows for vastly different control efficiencies. Therefore, NRG asserts that the Brayton Point mercury emissions limit is not reflective of what is achievable for Limestone Unit 3, which will burn sub-bituminous coal or other blends, rather than just bituminous coal. NRG's expert, Colin Campbell, explained that the chlorine content in the different types of coals affects the mercury speciation in the flue gas,

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[249] 40 C.F.R. § 63.41.

[250] NRG Ex. 7, at 55.

which in turn affects capturability. Based upon this, he opined that Limestone Unit 3 (which would not burn only bituminous coal) could not achieve the low rate of the Brayton Point Facility that burns only bituminous coal.[251] His arguments would hold true generally for any facilities burning bituminous coals instead of sub-bituminous coals or blends.

The ALJs are concerned with NRG's failure to address why the fuel mix should impact the MACT similar source analysis, but nonetheless find that the mercury emissions limits proposed by NRG as MACT are, in fact, the maximum achievable. Although NRG perhaps should have included all coal-fired boilers, regardless of fuel mix, in its analysis of similar sources, the failure to do so does not appear to impact the MACT analysis. First, as NRG notes, different fuel mixes will have different control efficiencies. Therefore, even if facilities using different fuel mixes are included in the similar source analysis, adjustment to the emissions limits will have to be made to account for those fuel mix differences. Protestants appear to recognize this in their briefing.

In fact, NRG identified the Brayton Point facility in its MACT analysis, even though that facility used a different fuel mix. NRG then explained, through its evidence, that the effective limit calculated for Brayton Point is not applicable because that limit was established on the basis of burning bituminous coal only, which the ALJs agree does not offer a comparable representation of the achievable emissions limits for a facility using sub-bituminous coal or blends thereof (such as Limestone Unit 3). Other than pointing to Brayton Point, Protestants have not identified any other sources they contend should have been included in the category of similar sources for MACT analysis.

Based upon the evidence that has been presented, the ALJs conclude that, even if more facilities using bituminous coal (like Brayton Point) had been included, those facilities would be distinguishable in the same manner as Brayton Point. Therefore, the ALJs have no reason to believe that including all coal-fired boilers in the analysis would change the end result. Rather,

[251] Tr. at 633.

the Walter Scott unit in Iowa is the best example of the MACT floor for facilities burning sub-bituminous coal, and NRG proposes emissions limits similar to that unit. As such, the ALJs believe that the preponderance of the evidence indicates that NRG's proposed emissions limits for mercury are consistent with MACT.

Moreover, the limit calculated for Brayton Point was not an enforceable permit limit under Massachusetts law, which allows for higher levels of mercury emissions under certain circumstances and for trading between affected sources.[252] Thus, the calculated emissions limit for Brayton Point is simply not directly applicable for determining the mercury emissions limits for Limestone Unit 3. Rather, all of the other evidence in the record supports the conclusion that NRG's proposed sliding scale emissions limit for mercury is truly representative of MACT, and Protestants have presented no controverting evidence to support otherwise.

V. TRANSCRIPT COSTS

In accordance with Commission rules, the ALJs required a transcript be prepared in this case because the hearing was scheduled to last longer than one day.[253] NRG agreed to pay the costs associated with an expedited transcript. The non-expedited transcription costs are $6,974.75. Protestants request that the Commission assess all transcript costs to NRG. In contrast, NRG concedes that it will likely be expected to bear a large part of the costs, but asserts that Valence and the other Protestants should be assessed a significant portion as well. After considering the factors set out in the TCEQ's rules, the ALJs recommend that the Commission assess all transcription costs against NRG.

The Commission's rules at 30 TEX. ADMIN. CODE § 80.23(d) list the factors to be considered in assessing reporting and transcription costs. The factors relevant to this case

[252] NRG Ex. 71, at 18-19.

[253] 30 TEX. ADMIN. CODE § 80.23(b)(4).

include the following, along with the ALJs' analysis of each factor as applied to the facts of this case:

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

(B) "The financial ability of the party to pay costs." With the exception of Valence and Sierra Club, Protestants are generally individuals or small non-profit organizations created to oppose NRG's permit request and other similar applications. NRG is a for-profit corporate entity and likely has the greatest financial ability to pay costs.

(C) "The extent to which the party participated in the hearing." NRG, Sierra Club, Valence, and RCOLOL participated the most in the hearing. The ALJs find that the questioning of witnesses by the parties was generally to the point and directed toward relevant issues. NRG and the ED had 12 witnesses plus NRG's rebuttal case, as compared to Protestants' four witnesses. It is not surprising then that Protestant's cross-examination comprised the majority of the transcript. The ALJs find that the extent of participation by all parties was appropriate and that none of the parties unduly burdened the transcript with frivolous arguments or unnecessary questioning of witnesses. Protestants did an admirable job of focusing solely on issues of legitimate concern.

(D) "The relative benefits to the various parties of having a transcript." As the party bearing the burden of proof, NRG 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 OPIC). *See* 30 TEX. ADMIN CODE § 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 find that all parties had plausible, good-faith arguments for the issues they raised.

In looking at these factors, it appears that transcript costs could reasonably be assessed against NRG, Sierra Club, and Valence, as parties with the resources to pay costs and who actively participated in the hearing. However, the arguments raised by Sierra Club and Valence were legitimate and established concerns that the ALJs find are founded. Therefore, the ALJs do not believe it appropriate to penalize them for challenging the permit applications when they have identified legitimate inadequacies in those applications. Therefore, the ALJs find it appropriate to assess all transcript costs to NRG.

VI. SUMMARY OF CHANGES AND SPECIAL CONDITIONS

As set out above, the ALJs recommend a number of changes to the emissions limits or requirements to be included in the requested permits. Further, NRG has proposed certain special conditions that it agrees are acceptable. For ease of reference for the Commission, the ALJs identify below each of their recommended changes and NRG's included special conditions (as related to the contested issues addressed in this PFD):[254]

[254] The proposed final order submitted along with this PFD contains these changes, including the special conditions noted herein, in language the ALJs find acceptable.

- Lower the total PM/PM_{10} emissions limit from 0.035 to 0.025 lb/MMBtu (annual average).

- Lower the short-term (30-day rolling average) emissions limit for NO_x from 0.07 to 0.06 lb/MMBtu.

- Lower the short-term (30-day rolling average) emissions limit for CO from 0.15 to 0.12 lb/MMBtu.

- Include modified Special Condition No. 42, which requires a commitment to no increase in emissions of SO_2, NO_x, and mercury for the Limestone Station facility.

- Include proposed Special Condition No. 43, which requires a commitment to no net increase in NO_x emissions on a 30-day rolling average upon start-up of Limestone Unit 3.

- Include Special Condition No. 44, which requires NRG to erect a physical barrier (fencing or otherwise) around the Limestone Station property line or the boundary used for air dispersion modeling before Limestone Unit 3 is constructed; however, Special Condition No. 44 should be modified to reflect that NRG also must control access through the barrier.

NRG has also proposed to use continuous emissions monitoring (CEMS) at the site for purposes of monitoring emissions of SO_2, NO_x, CO, and mercury. This proposal is reflected in the draft permit and the MACT application. It should continue to be part of the permits and the permit language should ensure it is a requirement. Moreover, the ALJs believe it would be appropriate to also require that CEMS be implemented for particulate matter as well, for the reasons discussed on pages 50-52 of Sierra Club's closing brief.

VII. CONCLUSION

In conclusion, the ALJs find that NRG has conducted acceptable air modeling consistent with the applicable guidelines and Commission precedent, and developed emissions limits that, as modified herein, generally represent those achievable with the best available control technology. Accordingly, the ALJs believe that the requested State Air Quality and federal PSD

permits may be issued, with the special conditions and modified emissions limits recommended herein.

However, the ALJs conclude that the MACT application is deficient in that it fails to identify a specific mercury control technology to be used at Limestone Unit 3 to achieve MACT mercury emissions control. Accordingly, the ALJs recommend that the MACT permit application be remanded for further development of the mercury control technology to be used at Limestone Unit 3 or denied. However, even if the MACT application is denied or remanded, the BACT emissions limits in the State Air Quality and federal PSD permits should be lowered to match those emissions limits shown achievable by the MACT application.

SIGNED June 23, 2009.

CRAIG R. BENNETT
ADMINISTRATIVE LAW JUDGE
STATE OFFICE OF ADMINISTRATIVE HEARINGS

TOMMY L. BROYLES
ADMINISTRATIVE LAW JUDGE
STATE OFFICE OF ADMINISTRATIVE HEARINGS

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

ORDER
REGARDING THE APPLICATION BY NRG TEXAS POWER LLC FOR STATE AIR QUALITY PERMIT 79188, PREVENTION OF SIGNIFICANT DETERIORATION AIR QUALITY PERMIT PSD-TX-1072, AND HAZARDOUS AIR POLLUTANT MAJOR SOURCE PERMIT NO. HAP-14
TCEQ DOCKET NOS. 2007-1820-AIR and 2008-1210-AIR
SOAH DOCKET NOS. 582-08-0861 and 582-08-4013

On _____ , the Texas Commission on Environmental Quality (TCEQ or Commission) considered the application of NRG Texas Power L.L.C. for State Air Quality and federal Prevention of Significant Deterioration permits to construct a new 800 megawatt (MW) coal-fired electric generating unit and associated facilities at its existing Limestone Electric Generating Station located in Limestone County, Texas. A Proposal for Decision was presented by Administrative Law Judges (ALJs) Tommy L. Broyles and Craig R. Bennett of the State Office of Administrative Hearings (SOAH), who conducted a hearing in this matter on February 23-27, 2009, in Austin, Texas. The record closed on April 24, 2009.

After considering the Proposal for Decision, the Commission makes the following Findings of Fact and Conclusions of Law.

FINDINGS OF FACT

Introduction and Procedural History

1. NRG has requested a permit to construct a new solid fuel-fired utility boiler with a heat input of 8,000 MMBtu/hour (Limestone Unit 3) and ancillary equipment (collectively, the "Limestone Unit 3 project").

2. The Limestone Unit 3 project will be located at the existing Limestone Electric Generating Station (Limestone Station) in Limestone County, Texas, approximately nine miles north of Jewett, Texas on FM 39.

3. The Limestone Unit 3 project will consist of a supercritical pulverized coal-fired electric generating unit and related facilities, and it will be the third coal-fired steam electric unit at NRG's Limestone Station.

4. Limestone Unit 3 will use sub-bituminous coal as the primary fuel source, with secondary fuels—which could be used in a blend with sub-bituminous coal—including Eastern bituminous coal or petroleum coke.

5. Pursuant to Section 116.111(a)(1) of the Commission's rules, NRG filed a PI-1 General Application with supporting information for state air quality and prevention of significant deterioration (PSD) review (the "State Air Quality/PSD Application"). The State Air Quality/PSD Application was filed with the Executive Director (ED) of the TCEQ on June 12, 2006.

6. The State Air Quality/PSD Application was declared administratively complete on June 14, 2006, and technically complete on October 8, 2007.

7. NRG published "Notice of Receipt of Application and Intent to Obtain Air Permit" in the *Groesbeck Journal* on June 22, 2006.

8. NRG published "Notice of Application and Preliminary Decision for an Air Quality Permit" in the *Jewett Messenger* on November 7, 2007, and in the *Groesbeck Journal* and the *Teague Chronicle* on November 8, 2007.

9. The State Air Quality/PSD Application was made available for public inspection at the Limestone County Courthouse in Groesbeck, Limestone County, Texas, during the entire public notice period.

10. Notification of the State Air Quality/PSD Application was made to all agencies, regulatory bodies, and other entities to which notification is required.

11. After publication of public notice, a preliminary hearing was held before SOAH on January 24, 2008, and a procedural schedule was established.

12. In March 2008, the United States Circuit Court of Appeals for the District of Columbia vacated the Clean Air Mercury Rule (CAMR) of the United States Environmental Protection Agency (EPA), along with the EPA's rule delisting coal-fired electric generating units from regulation under Section 112 of the federal Clean Air Act (FCAA), effectively requiring a case-by-case Maximum Achievable Control Technology (MACT) determination by the TCEQ prior to the start of construction on Limestone Unit 3, in addition to the already-existing requirement that NRG satisfy state air quality and PSD standards.

13. In Order No. 8, SOAH abated this proceeding to allow time for NRG to file a new application concerning case-by-case MACT requirements, in light of the D.C. Circuit Court's decision.

14. NRG submitted an application on May 12, 2008, for a case-by-case MACT determination for Limestone Unit 3 and the Limestone Unit 3 project auxiliary boiler (the "Case-by-Case MACT Application").

15. The Case-by-Case MACT Application was determined to be administratively and technically complete on July 18, 2008.

16. NRG published "Notice of Application and Preliminary Decision for an Air Quality Permit" in the *Jewett Messenger* on July 23, 2008, and in the *Groesbek Journal* and the *Teague Chronicle* on July 24, 2008.

17. The Case-by-Case MACT Application was made available for public inspection at the Limestone County Courthouse in Groesbeck, Limestone County, Texas, during the entire public notice period.

18. Notification of the Case-by-Case MACT Application was made to all agencies, regulatory bodies, and other entities to which notification is required.

19. After publication of public notice, a preliminary hearing regarding the Case-by-Case MACT Application was held before SOAH on September 15, 2008, and a procedural schedule was established.

20. On October 14, 2008, the presiding ALJs consolidated SOAH Docket Nos. 582-08-4013 and 582-08-0861 and established Docket No. 582-08-0861 as the lead docket.

21. On February 23-27, 2009, the hearing on the merits in the consolidated dockets convened before ALJs Tommy L. Broyles and Craig R. Bennett. The following parties appeared and participated in the hearing: (1) NRG; (2) the Sierra Club; (3) Robertson County Our Land Our Lives (RCOLOL); (4) Valence Operating Company (Valence); (5) Douglas Ray; (6) Citizens for Environmental Clean-Up (CEC); (7) the ED; and (8) the Office of Public Interest Counsel (OPIC).

22. The hearing record closed on April 24, 2009, after written closing arguments were filed.

Completeness of the State Air Quality/PSD Application

23. All appropriate forms were submitted in the State Air Quality/PSD Application.

24. The process descriptions included in the State Air Quality/PSD Application are accurate.

25. The State Air Quality/PSD Application addressed all sources of air emissions associated with the Limestone Unit 3 Project that are subject to permitting under TCEQ rules.

26. The State Air Quality/PSD Application addressed applicable TCEQ Disaster Review requirements triggered by the Limestone Unit 3 Project.

27. NRG has committed to prepare a risk management plan before bringing ammonia on-site for storage.

28. The appropriate permit fee of $75,000 was submitted with the State Air Quality/PSD Application.

29. The State Air Quality/PSD Application was submitted under the seal of Brian Gunzelman, a Texas registered professional engineer.

30. TCEQ staff reviewed NRG's application to determine whether it complied with all applicable rules and policies and documented the conclusions of that review in the Construction Permit Review Analysis and Technical Review for Permit No. 79188/PSD-TX-1072.

Completeness of the Case-by-Case MACT Application

31. The appropriate permit fee of $900 was submitted with the Case-by-Case MACT Application.

32. Except in regard to mercury control technology, the Case-by-Case MACT Application contains all of the required elements of an FCAA section 112(g) preconstruction permit application filed under Chapter 116 of TCEQ's rules.

33. TCEQ staff reviewed the Case-by-Case MACT Application and documented the conclusions of that review in the Construction Permit Review Analysis and Technical Review for Permit No. HAP-14.

No Net Increase Commitment

34. On November 29, 2007, NRG submitted a letter to the TCEQ in which NRG committed to no net increase in annual emissions of NOx, SO_2, and mercury from the Limestone Station following operation of Limestone Unit 3.

35. The ED, in the Response to Comments dated February 19, 2008, proposed an additional permit term (Special Condition No. 42) for draft permit No. 79188 and PSD-TX-1072 that makes the no net increase commitment an enforceable permit condition.

36. On May 12, 2008, NRG submitted to TCEQ a proposed "netting" demonstration for criteria pollutants NO_x and SO_2.

37. NRG has not proposed the precise method of achieving the netting and does not propose to implement an actual and measurable decrease in emissions from Limestone Units 1 or 2 (or other existing facilities causing emissions at the site) before Limestone Unit 3 begins operating.

38. The May 2008 netting demonstration does not show that the emissions reductions will be "creditable" (*i.e.*, achieved before emissions increases occur from new units).

39. TCEQ staff did not conduct a substantive review of NRG's proposed netting demonstration. Rather, because the netting demonstration was submitted after TCEQ staff had completed its BACT review for the state air quality/PSD permit, such staff simply reviewed the written documentation and filed it away without conducting any substantive review or analysis of it—treating it simply as a commitment (as opposed to an actual demonstration).

40. NRG's proposed netting demonstration is inadequate and does not eliminate the need for PSD review for criteria pollutants NOx and SO_2 in the State Air Quality/PSD Application.

Demonstrations Under 30 TEX. ADMIN. CODE §116.111: Protection of Public Welfare Air Dispersion Modeling

The "General Public" and "Ambient Air"

41. An applicant demonstrates that emissions from a proposed facility will be protective of the public health and physical property by evaluating predicted concentrations of air pollutants in the ambient air with air dispersion modeling.

42. TCEQ air permitting guidance specifies that ambient air "starts at the property line."

43. Protestant Valence leases (although the oil and gas lease is a determinable fee and is a sale of interest in land) the mineral rights under parts of the Limestone Station. As a result of that mineral interest, Valence employees and contractors have a right of access

to the Limestone Station property (solely for purposes of oil and gas development) that is not shared with members of the general public.

44. Valence employees or contractors present on the Limestone Station property are not the general public for purposes of the air dispersion modeling demonstrations required for the Limestone Unit 3 project.

45. Before Limestone Unit 3 is constructed, NRG will control access to the Limestone Station property, and it will prevent the general public from entering the Limestone Station property with a fence line.

46. The areas in which Valence employees or contractors work on the Limestone Station property are not considered "ambient air" for purposes of the air dispersion modeling demonstrations required for the Limestone Unit 3 project, provided that NRG will control access to the Limestone Station property and prevent the general public from entering the Limestone Station property with a fence line

47. The air dispersion modeling demonstration performed by NRG, which evaluates predicted air quality impacts at and beyond the Limestone Station property line, is proper.

NRG's Air Dispersion Modeling

48. NRG performed air dispersion modeling, which was summarized in its November 2006 Air Quality Analysis Report, and in follow-up submittals dated March 12, 2007; August 8, 2007; September 21, 2007; and December 21, 2007.

49. NRG performed the modeling using EPA models Industrial Source Complex Short-Term Model, Version 3 (ISCST3) and ISCST3 Prime. These models were recommended by both the TCEQ and the EPA for modeling complex industrial sources like the Limestone Station.

50. The modeling that was included in the State Air Quality/PSD Application was performed in accordance with applicable air quality rules and guidance, and in accord with the

modeling protocol cooperatively developed for this project by NRG and TCEQ's air dispersion modeling team.

51. There are no schools located within 3,000 feet of the facilities to be authorized under the State Air Quality/PSD Application.

52. In performing the air dispersion modeling, NRG modeled emissions from all of its authorized facilities at the site, including the proposed Limestone Unit 3 facilities.

53. NRG included road emissions from on-site haul roads for modeling runs to demonstrate compliance with the annual National Ambient Air Quality Standard (NAAQS) for particulate matter consisting of particles with diameters less than or equal to 10 microns (PM_{10}) and the annual PSD Increment for PM_{10}.

54. NRG excluded road emissions for other modeling purposes, in accordance with TCEQ guidance.

55. Under TCEQ's modeling guidance, modeling of road dust emissions is explicitly excluded for short-term averaging periods.

56. Under TCEQ's modeling guidance, modeling of plant road dust emissions is excluded for long-term averaging periods if the emissions will not be generated in association with transport, storage, or transfer of road-base aggregate materials and if best management practices are used to control dust emissions.

57. NRG will be transporting no road-base aggregate materials at the Limestone Station and will employ best management practices for minimizing dust, such as watering plant roads as needed to control fugitive dust emissions.

58. NRG's air dispersion modeling was conservative, that is, it tended to over-predict off-property ambient concentrations.

    a. NRG used worst-case emission rates for Limestone Unit 3 project facilities, including start-up emission rates that, in reality, will occur infrequently.

b. Modeled emissions do not factor in the effects of NRG's commitment for no net increase in emissions of NO_x, SO_2, or mercury, nor does the air dispersion modeling take into account reductions required by the draft Case-by-Case MACT permit.

c. NRG assumed that all sources at the Limestone Station would be operating simultaneously and emitting their maximum rates at the same time, which will not occur in practice.

d. NRG coupled worst-case meteorological dispersion conditions with the worst-case emissions scenario to calculate maximum off-property impacts.

e. NRG used conservative background concentrations in the modeling analyses.

f. NRG did not consider deposition as part of the regulatory default options in the ISCST3 model setup.

59. NRG properly relied on the pre-processed National Weather Service meteorological data supplied by the TCEQ in conducting its modeling.

60. Monitored background concentrations of PM and SO_2 for Travis County are appropriate for modeling a source in Limestone County because the Travis County data provides a conservative estimate of the ambient contributions of PM and SO_2 from non-point sources in Limestone County.

61. TCEQ's modeling staff performed an audit of NRG's modeling and found it acceptable.

62. The standards and guidelines applicable to this permit application's maximum modeled pollutant concentrations are: NAAQS, PSD increments, Net Ground Level Concentration (NGLC) or "state property-line" standards, and Effects Screening Levels (ESLs).

NAAQS Analysis

63. NRG directly modeled its emissions of SO_2, NO_x, CO, PM_{10}, and lead for the purpose of demonstrating compliance with the NAAQS.

64. Under the TCEQ's *Air Quality Modeling Guidelines*, a PSD NAAQS demonstration is required for emissions of criteria pollutants for which the project emissions increase exceeds the PSD significant threshold. A state NAAQS demonstration is required for

emissions of criteria pollutants for which the project emissions increase falls below the PSD significant threshold.

65. The State Air Quality/PSD Application included an acceptable PSD NAAQS demonstration for SO_2 and NO_2.

66. NRG conducted modeling to make a state NAAQS demonstration for lead.

67. For the pollutants and averaging times for which maximum modeled concentrations resulting from emissions at the Limestone Station were above *de minimis* levels, NRG modeled non-Limestone Station emissions and added an ambient background concentration to consider the influence of other sources affecting the Limestone Station impact areas.

68. The ambient background concentrations used by NRG for the area of the Limestone Station are conservative and in accordance with TCEQ guidance.

SO_2

69. SO_2 NAAQS exist for three averaging periods: three-hour (1300 $\mu g/m^3$), 24-hour (365 $\mu g/m^3$), and annual (80 $\mu g/m^3$).

70. Background concentrations for SO_2 were obtained by reviewing concentrations measured in Travis County and by comparing SO_2 emissions in Limestone and Travis County. Emissions from non-point sources are much higher in Travis County than in Limestone County, while emissions from point sources are higher in Limestone County. Since emissions from point sources are included in the modeling retrieval, using Travis County background concentrations is conservative.

71. The maximum modeled 3-hour SO_2 concentration resulting from the Limestone Station's emissions, including the Limestone Unit 3 project, at any off-site location is 427.67 $\mu g/m^3$; and the ambient background concentration for Travis County is 17.89 $\mu g/m^3$.

72. The Limestone Station's SO_2 emissions, when added to the background level of ambient SO_2, will not cause or contribute to an exceedance of the 3-hour SO_2 NAAQS of 1,300 $\mu g/m^3$.

73. The maximum modeled 24-hour SO_2 concentration resulting from the Limestone Station's emissions, including the Limestone Unit 3 project, at any off-site location is 74.64 $\mu g/m^3$; and the ambient background concentration for Travis County is 8.95 $\mu g/m^3$.

74. The Limestone Station's SO_2 emissions, when added to the background level of ambient SO_2, will not cause or contribute to an exceedance of the 24-hour SO_2 NAAQS of 365 $\mu g/m^3$.

75. The maximum modeled annual average SO_2 concentration resulting from the Limestone Unit 3 project's emissions at any off-site location is 0.4 $\mu g/m^3$, which is below the *de minimis* level for annual average SO_2 of 1.0 $\mu g/m^3$.

76. The impact of the Limestone Unit 3 project's SO_2 emissions on annual-average concentrations is insignificant and will not cause or contribute to an exceedance of annual-average SO_2 NAAQS of 80 $\mu g/m^3$.

NO_2

77. NO_2 NAAQS exist for one averaging period: annual (100 $\mu g/m^3$).

78. Travis County background concentrations provide a conservative estimate of ambient background concentrations of NO_2 at the Limestone Station.

79. The maximum modeled annual average NO_2 concentration resulting from the Limestone Station's emissions, including the Limestone Unit 3 project, at any off-site location is 2.02 $\mu g/m^3$; and the ambient background concentration for Travis County is 9.03 $\mu g/m^3$.

80. The Limestone Station's NO_2 emissions, when added to the background level of ambient NO_2, will not cause or contribute to an exceedance of the annual-average NO_2 NAAQS of 100 $\mu g/m^3$.

CO

81. CO NAAQS exist for two averaging periods: 1-hour (40,000 $\mu g/m^3$) and 8-hour (10,000 $\mu g/m^3$).

82. The maximum modeled 1-hour average CO concentration resulting from the Limestone Unit 3 project's emissions at any off-site location is 584.6 $\mu g/m^3$, which is below the *de minimis* level for 1-hour average CO of 2,000 $\mu g/m^3$.

83. The impact of the Limestone Unit 3 project's CO emissions on 1-hour average concentrations is insignificant and will not cause or contribute to an exceedance of 1-hour average CO NAAQS of 40,000 $\mu g/m^3$.

84. The maximum modeled 8-hour average CO concentration resulting from the Limestone Unit 3 project's emissions at any off-site location is 274.41 $\mu g/m^3$, which is below the *de minimis* level for 8-hour average CO of 500 $\mu g/m^3$.

85. The impact of the Limestone Unit 3 project's CO emissions on 8-hour average concentrations is insignificant and will not cause or contribute to an exceedance of 8-hour average CO NAAQS of 10,000 $\mu g/m^3$.

Lead

86. NRG performed an acceptable state NAAQS demonstration for lead.

87. TCEQ guidance establishes a quarterly "screening threshold" of 0.01 $\mu g/m^3$ for state NAAQS compliance demonstrations for lead.

88. If the maximum predicted off-property concentration of lead from a project falls below the screening threshold, the state NAAQS demonstration for lead is complete and the project is deemed not to cause or contribute to a violation of the lead NAAQS.

89. NRG's modeling established that the maximum predicted off-property concentration of lead from the Limestone Unit 3 project over a calendar quarter is 0.0003$\mu g/m^3$.

Accordingly, the impact of the Limestone Unit 3 project's lead emissions is insignificant and will not cause or contribute to an exceedance of the lead NAAQS.

PM_{10}

90. PM_{10} NAAQS exist for two averaging periods: 24-hour (150 $\mu g/m^3$) and annual (50 $\mu g/m^3$).

91. Background concentrations for PM_{10} were obtained by reviewing concentrations measured in Travis County and by comparing PM_{10} emissions in Limestone and Travis County. Travis County background concentrations provide a conservative estimate of ambient background concentrations of PM_{10} at the Limestone Station.

92. The maximum NRG modeled 24-hour average PM_{10} concentration resulting from the Limestone Station's emissions, including the Limestone Unit 3 project, at any off-site location is 26.06 $\mu g/m^3$; and the maximum ambient background concentration is 53.0 $\mu g/m^3$.

93. The Limestone Station's PM_{10} emissions, when added to the background level of ambient PM_{10}, will not cause or contribute to an exceedance of the 24-hour PM_{10} NAAQS of 150 $\mu g/m^3$.

94. The maximum modeled annual average PM_{10} concentration resulting from the Limestone Station's emissions, including the Limestone Unit 3 project, at any off-site location is 6.62 $\mu g/m^3$; and the maximum ambient background concentration is 22.5 $\mu g/m^3$.

95. The Limestone Station's PM_{10} emissions, when added to the background level of ambient PM_{10}, will not cause or contribute to an exceedance of the annual PM_{10} NAAQS of 50 $\mu g/m^3$.

$PM_{2.5}$

96. Both EPA and TCEQ accept demonstration of compliance with the PM_{10} NAAQS as a surrogate for demonstration of compliance with the $PM_{2.5}$ NAAQS.

97. The Limestone Station's emissions, including the Limestone Unit 3 project, of PM_{10} will not cause or contribute to an exceedance of the PM_{10} NAAQS.

98. The Limestone Station's emissions, including the Limestone Unit 3 project, of $PM_{2.5}$ will not cause or contribute to an exceedance of the $PM_{2.5}$ NAAQS.

Ozone

99. The Limestone Unit 3 project will emit NO_x and volatile organic compounds (VOCs), which, in the presence of sunlight, can form ozone in the atmosphere.

100. TCEQ requires the use of a screening technique to determine whether a proposed source will cause ozone exceedances in the local attainment area.

101. If a source is NO_x-dominated, then local ozone impacts will be insignificant and the analysis is deemed complete.

102. NRG properly applied the screening technique to determine that the Limestone Unit 3 project is NO_x-dominated.

103. NRG demonstrated that there would not be a significant change to the current ozone levels in the local attainment area due to the Limestone Unit 3 project.

104. The Limestone Unit 3 project will not cause any ozone NAAQS exceedances in the local attainment area.

105. NRG also conducted photochemical modeling to evaluate the maximum potential impact of the Limestone Unit 3 project on ozone concentration in other areas.

106. TCEQ does not require that an applicant conduct photochemical modeling to evaluate potential ozone impacts for PSD permitting.

107. The project's maximum incremental contribution to any regulatory monitor, based on photochemical modeling, is 0.07 ppb. This value is significantly below: (a) the level judged significant by EPA for use in regulatory impact modeling, (b) the actual

application of EPA's Attainment Test, and (c) the lower threshold detection limit of 3-5 ppb of regulatory monitors.

108. NRG's photochemical modeling represents a conservative prediction of ozone impacts from the Limestone Unit 3 project because it does not account for NRG's commitment to no site-wide net increase of annual emissions of NO_x from the Limestone Station. Considering this commitment, the Limestone Unit 3 project will not measurably influence ambient ozone concentrations at any monitored or unmonitored location in Texas.

NAAQS Summary

109. Emissions from the Limestone Unit 3 project will not cause or measurably contribute to an exceedance of any NAAQS.

PSD Increment Analysis

110. PSD increments are allowable incremental changes in off-property concentrations of certain pollutants for which PSD review has been triggered. Concentration increases in excess of these levels are considered by EPA as significantly deteriorating air quality.

111. NRG performed a PSD increment demonstration for emissions of SO_2, NO_2, and PM_{10} from the Limestone Station and the Limestone Unit 3 project.

112. Maximum modeled concentrations resulting from emissions from the Limestone Unit 3 project were below *de minimis* levels for SO_2 (annual averaging period) and CO (1-hour and 8-hour averaging periods).

113. The impacts of the Limestone Unit 3 project's emissions of SO_2 are insignificant and will not cause or contribute to an annual NAAQS or PSD increment violation, and the expected emissions of CO from the Limestone Unit 3 project are insignificant and will not cause or contribute to a violation of the NAAQS.

114. Maximum modeled concentrations resulting from emissions from the Limestone Unit 3 project were above *de minimis* levels for SO_2 (3-hour and 24-hour averaging periods),

NO_2 for the annual averaging period, and PM_{10} for the 24-hour and annual averaging periods.

115. For the above pollutants and averaging times, NRG incorporated emissions data for other PSD increment-consuming sources from TCEQ's Point Source Database into the model.

116. In addition to the Point Source Database data, NRG incorporated emissions data from a number of pending PSD applications not included in the Point Source Database for proposed solid fuel-fired electric generating units that NRG identified as potentially having a significant impact on the area of significant impact for the Limestone Unit 3 project.

117. For each of the above pollutants and averaging periods, the combined impacts from the Limestone Station and Limestone Unit 3 project's maximum modeled concentrations and the PSD increment-consuming sources are less than the applicable PSD increment.

PSD Increment Analysis: SO_2

118. The maximum modeled 3-hour average SO_2 concentration resulting from the combined effect of the emissions from the Limestone Station, Limestone Unit 3 project, and other PSD increment-consuming sources in the area is 427.66 $\mu g/m^3$.

119. The Limestone Unit 3 project's SO_2 emissions will not cause or contribute to an exceedance of the 3-hour average SO_2 PSD increment of 512 $\mu g/m^3$.

120. The maximum modeled 24-hour average SO_2 concentration resulting from the combined effect of the emissions from the Limestone Station, Limestone Unit 3 project, and other PSD increment-consuming sources in the area is 74.15 $\mu g/m^3$.

121. The Limestone Unit 3 project's SO_2 emissions will not cause or contribute to an exceedance of the 24-hour average SO_2 PSD increment of 91 $\mu g/m^3$.

PSD Increment Analysis: NO_2

122. The maximum modeled annual average NO_2 concentration resulting from the combined effect of the emissions from the Limestone Station, Limestone Unit 3 project, and other PSD increment-consuming sources in the area is 2.01 $\mu g/m^3$.

123. The Limestone Unit 3 project's NO_2 emissions will not cause or contribute to an exceedance of the annual average NO_2 PSD increment of 25 $\mu g/m^3$.

PSD Increment Analysis PM_{10}

124. NRG's maximum modeled 24-hour average PM_{10} concentration resulting from the combined effect of the emissions from the Limestone Station, Limestone Unit 3 project, and other PSD increment-consuming sources in the area is 26.06 $\mu g/m^3$.

125. The Limestone Unit 3 project's PM_{10} emissions will not cause or contribute to an exceedance of the 24-hour average PM_{10} PSD increment of 30 $\mu g/m^3$ because at any receptors where the increment is possibly exceeded, the contribution from Limestone Unit 3 is *de minimis*.

126. The maximum modeled annual average PM_{10} concentration resulting from the combined effect of the emissions from the Limestone Station, Limestone Unit 3 project, and other PSD increment-consuming sources in the area is 6.43 $\mu g/m^3$.

127. The Limestone Unit 3 project's PM_{10} emissions will not cause or contribute to an exceedance of the annual average PM_{10} PSD increment of 17 $\mu g/m^3$.

PSD Increment Analysis: Summary

128. Emissions from the Limestone Unit 3 project will not cause or contribute to exceedances of any PSD increments.

129. On behalf of Sierra Club, Camille Marie Sears used the same modeling inputs relied on by NRG and the ED and modeled PM_{10} emissions at receptors around Limestone Station that were not required to be modeled by EPA and TCEQ guidance.

130. Ms. Sears found impacts above the 24-hour average PM_{10} PSD increment of 30 $\mu g/m^3$.

131. At any receptors where the increment is possibly exceeded, the contribution from Limestone Unit 3 is *de minimis*.

PSD Monitoring Analysis

132. Of the criteria pollutants that will be emitted by the Limestone Unit 3 project in PSD-significant amounts, PSD monitoring *de minimis* levels exist for SO_2 (24-hour averaging period); NO_2 (annual averaging period), CO (8-hour averaging period), and PM_{10} (24-hour averaging period).

133. Maximum modeled concentrations resulting from the Limestone Unit 3 project's emissions are below all applicable PSD monitoring *de minimis* levels except for 24-hour SO_2 and 24-hour PM_{10}, for which NRG used existing monitoring data.

State Property Line Analysis

134. State property-line standards are maximum air concentrations that are allowed to result from all sources on a contiguous site.

135. State property-line standards exist for total sulfuric acid (H_2SO_4) for 1-hour and 24-hour averaging periods and for SO_2 for a 30-minute averaging period.

136. NRG modeled site-wide emissions from the Limestone Station, including the Limestone Unit 3 project, for comparison to applicable property-line standards.

137. NRG's maximum off-property modeled concentrations were below the applicable state property line standards.

Property-Line Standard: H_2SO_4

138. The maximum 1-hour average H_2SO_4 concentration resulting from site-wide emissions at any off-property location is 29.54 $\mu g/m^3$.

139. The site-wide H_2SO_4 emissions will not cause an exceedance of the 1-hour H_2SO_4 property line standard of 50 $\mu g/m^3$.

140. The maximum 24-hour average H_2SO_4 concentration resulting from site-wide emissions at any location is 2.26 $\mu g/m^3$.

141. The site-wide H_2SO_4 emissions will not cause an exceedance of the 24-hour H_2SO_4 property line standard of 15 $\mu g/m^3$.

Property-Line Standard: SO_2

142. The maximum 30-minute average SO_2 concentration resulting from site-wide emissions at any off-property location is 954.88 $\mu g/m^3$.

143. The site-wide SO_2 emissions will not cause an exceedance of the 30-minute SO_2 property line standard of 1,021 $\mu g/m^3$.

Property-Line Standard Summary

144. The Limestone Station, including the Limestone Unit 3 project, will not cause an exceedance of any applicable state property-line standard.

ESL Analysis

145. The TCEQ uses effects screening levels (ESL) as part of the state effects review of an air permit application, as conservative guideline levels to evaluate the potential for effects to public health, welfare or property as a result of exposure to air pollutants for which there is no state or federal air quality standard.

146. Health-based ESLs are set by starting with exposure levels that have been shown to cause no adverse health effects or very minor health effects in humans or animals, and then applying generous safety factors to establish levels that will be protective of the most sensitive members of the general public. Health-based ESLs are frequently set at levels that are 100 to 1000 times lower than exposure levels that are designed to be safe for workers exposed to airborne chemicals in occupational settings.

147. ESLs are set very conservatively and are designed to protect even the most sensitive members of the population, including children, the elderly, and people with pre-existing conditions.

148. Maximum modeled air concentrations that do not exceed the ESL will not cause adverse health or welfare effects from the public's exposure to that chemical, and concentrations above the ESLs will not necessarily cause adverse health or welfare effects, but may require further study.

149. It is common for an applicant's maximum modeled concentrations to exceed some ESLs and nevertheless receive authorization from TCEQ, as long as the steps outlined in TCEQ's Effects Evaluation Procedure are followed and the ground level concentrations are deemed acceptable by the TCEQ.

150. An ESL analysis is conducted only for sources on the applicant's property.

151. The ESL system currently used by TCEQ adequately protects the health and welfare of the public.

152. NRG modeled the site-wide emissions of the following non-criteria pollutants: coal dust, limestone dust, gypsum dust, crystalline silica, fused amorphous silica, VOC (as methyl hydrazine), hydrogen chloride (HCl), hydrogen fluoride (HF), ammonia, antimony, arsenic, barium, beryllium, cadmium, chromium, copper, manganese, mercury, nickel, selenium, silver, vanadium pentoxide, and zinc oxide.

153. For gypsum dust, the maximum modeled 1-hour average concentration from the Limestone Station and Limestone Unit 3 project's emissions is 0.597 $\mu g/m^3$, which is below the 1-hour ESL for gypsum dust of 50 $\mu g/m^3$.

154. The maximum modeled annual average concentration resulting from the Limestone Station and Limestone Unit 3 project's emissions of gypsum dust is 0.01 $\mu g/m^3$, which is less than the annual ESL for gypsum dust of 5 $\mu g/m^3$.

155. For crystalline silica, the maximum modeled 1-hour average concentration from the Limestone Station and Limestone Unit 3 project's emissions is 1.586 $\mu g/m^3$, which is below the applicable 1-hour ESL for crystalline silica of 10 $\mu g/m^3$.

156. The maximum modeled annual average concentration resulting from the Limestone Station and Limestone Unit 3 project's emissions of crystalline silica is 0.056 $\mu g/m^3$, which is less than the applicable annual ESL for crystalline silica of 1 $\mu g/m^3$.

157. For fused amorphous silica, the maximum modeled 1-hour average concentration from the Limestone Station and Limestone Unit 3 project's emissions is 4.8 $\mu g/m^3$, which is below the applicable 1-hour ESL for fused amorphous silica of 10 $\mu g/m^3$.

158. The maximum modeled annual average concentration resulting from the Limestone Station and Limestone Unit 3 project's emissions of fused amorphous silica is 0.162 $\mu g/m^3$, which is less than the applicable annual ESL for fused amorphous silica of 1.0 $\mu g/m^3$.

159. For VOC (as methyl hydrazine), the maximum modeled 1-hour average concentration from the Limestone Station and Limestone Unit 3 project's emissions is 0.12 $\mu g/m^3$, which is below the 1-hour ESL for VOC (as methyl hydrazine) of 0.2 $\mu g/m^3$.

160. The maximum modeled annual average concentration resulting from the Limestone Station and Limestone Unit 3 project's emissions of VOC (as methyl hydrazine) is 0.001 $\mu g/m^3$, which is less than the annual ESL for VOC (as methyl hydrazine) of 0.02 $\mu g/m^3$.

161. For HCl, the maximum modeled 1-hour average concentration from the Limestone Station and Limestone Unit 3 project's emissions is 23.74 $\mu g/m^3$, which is below the 1-hour ESL for HCl of 75 $\mu g/m^3$.

162. The maximum modeled annual average concentration resulting from the Limestone Station and Limestone Unit 3 project's emissions of HCl is 0.059 $\mu g/m^3$, which is less than the annual ESL for HCl of 7.5 $\mu g/m^3$.

163. For HF, the maximum modeled 1-hour average concentration from the Limestone Station and Limestone Unit 3 project's emissions is 11.272 $\mu g/m^3$, which is below the 1-hour ESL for HF of 25 $\mu g/m^3$.

164. The maximum modeled 24-hour average concentration resulting from the Limestone Station and Limestone Unit 3 project's emissions of HF is 0.84 $\mu g/m^3$, which is less than the annual ESL for HF of 3 $\mu g/m^3$.

165. The maximum modeled 30-day average concentration resulting from the Limestone Station and Limestone Unit 3 project's emissions of HF is 0.254 $\mu g/m^3$, which is less than the annual ESL for HF of 0.5 $\mu g/m^3$.

166. The maximum modeled annual average concentration resulting from the Limestone Station and Limestone Unit 3 project's emissions of HF is 0.018 $\mu g/m^3$, which is less than the annual ESL for HF of 2.5 $\mu g/m^3$.

167. For antimony, the maximum modeled 1-hour average concentration from the Limestone Station and Limestone Unit 3 project's emissions is 0.008 $\mu g/m^3$, which is below the 1-hour ESL for antimony of 5 $\mu g/m^3$.

168. The maximum modeled annual average concentration resulting from the Limestone Station and Limestone Unit 3 project's emissions of antimony is 0.00003 $\mu g/m^3$, which is less than the annual ESL for antimony of 0.5 $\mu g/m^3$.

169. For arsenic, the maximum modeled 1-hour average concentration from the Limestone Station and Limestone Unit 3 project's emissions is 0.03 $\mu g/m^3$, which is below the 1-hour ESL for arsenic of 5 $\mu g/m^3$.

170. The maximum modeled annual average concentration resulting from the Limestone Station and Limestone Unit 3 project's emissions of arsenic is 0.00013 $\mu g/m^3$, which is less than the annual ESL for arsenic of 0.5 $\mu g/m^3$.

171. For barium, the maximum modeled 1-hour average concentration from the Limestone Station and Limestone Unit 3 project's emissions is 0.673 $\mu g/m^3$, which is below the 1-hour ESL for barium of 5 $\mu g/m^3$.

172. The maximum modeled annual average concentration resulting from the Limestone Station and Limestone Unit 3 project's emissions of barium is 0.00308 $\mu g/m^3$, which is less than the annual ESL for barium of 0.5 $\mu g/m^3$.

173. For beryllium, the maximum modeled 1-hour average concentration from the Limestone Station and Limestone Unit 3 project's emissions is 0.01 $\mu g/m^3$, which is below the 1-hour ESL for beryllium of 0.02 $\mu g/m^3$.

174. The maximum modeled annual average concentration resulting from the Limestone Station and Limestone Unit 3 project's emissions of beryllium is 0.00001 $\mu g/m^3$, which is less than the annual ESL for beryllium of 0.002 $\mu g/m^3$.

175. For cadmium, the maximum modeled 1-hour average concentration from the Limestone Station and Limestone Unit 3 project's emissions is 0.009 $\mu g/m^3$, which is below the 1-hour ESL for cadmium of 0.1 $\mu g/m^3$.

176. The maximum modeled annual average concentration resulting from the Limestone Station and Limestone Unit 3 project's emissions of cadmium is 0.00003 $\mu g/m^3$, which is less than the annual ESL for cadmium of 0.01 $\mu g/m^3$.

177. For chromium, the maximum modeled 1-hour average concentration from the Limestone Station and Limestone Unit 3 project's emissions is 0.068 $\mu g/m^3$, which is below the 1-hour ESL for chromium of 1 $\mu g/m^3$.

178. The maximum modeled annual average concentration resulting from the Limestone Station and Limestone Unit 3 project's emissions of chromium is 0.0002 $\mu g/m^3$, which is less than the annual ESL for chromium of 0.1 $\mu g/m^3$.

179. For copper, the maximum modeled 1-hour average concentration from the Limestone Station and Limestone Unit 3 project's emissions is 0.025 $\mu g/m^3$, which is below the 1-hour ESL for copper of 10 $\mu g/m^3$.

180. The maximum modeled annual average concentration resulting from the Limestone Station and Limestone Unit 3 project's emissions of copper is 0.00012 $\mu g/m^3$, which is less than the annual ESL for copper of 1 $\mu g/m^3$.

181. For manganese, the maximum modeled 1-hour average concentration from the Limestone Station and Limestone Unit 3 project's emissions is 0.186 $\mu g/m^3$, which is below the 1-hour ESL for manganese of 2 $\mu g/m^3$.

182. The maximum modeled annual average concentration resulting from the Limestone Station and Limestone Unit 3 project's emissions of manganese is 0.00031 $\mu g/m^3$, which is less than the annual ESL for manganese of 0.2 $\mu g/m^3$.

183. For mercury, the maximum modeled 1-hour average concentration from the Limestone Station and Limestone Unit 3 project's emissions is 0.112 $\mu g/m^3$, which is below the 1-hour ESL for mercury of 0.25 $\mu g/m^3$.

184. The maximum modeled annual average concentration resulting from the Limestone Station and Limestone Unit 3 project's emissions of mercury is 0.00012 $\mu g/m^3$, which is less than the annual ESL for mercury of 0.025 $\mu g/m^3$.

185. For nickel, the maximum modeled 1-hour average concentration from the Limestone Station and Limestone Unit 3 project's emissions is 0.082 $\mu g/m^3$, which is below the 1-hour ESL for nickel of 0.15 $\mu g/m^3$.

186. The maximum modeled annual average concentration resulting from the Limestone Station and Limestone Unit 3 project's emissions of nickel is 0.0004 $\mu g/m^3$, which is less than the annual ESL for nickel of 0.015 $\mu g/m^3$.

187. For selenium, the maximum modeled 1-hour average concentration from the Limestone Station and Limestone Unit 3 project's emissions is 1.572 $\mu g/m^3$, which is below the 1-hour ESL for selenium of 2 $\mu g/m^3$.

188. The maximum modeled annual average concentration resulting from the Limestone Station and Limestone Unit 3 project's emissions of selenium is 0.001 $\mu g/m^3$, which is less than the annual ESL for selenium of 0.2 $\mu g/m^3$.

189. For silver, the maximum modeled 1-hour average concentration from the Limestone Station and Limestone Unit 3 project's emissions is 0.0005 $\mu g/m^3$, which is below the 1-hour ESL for silver of 0.1 $\mu g/m^3$.

190. The maximum modeled annual average concentration resulting from the Limestone Station and Limestone Unit 3 project's emissions of silver is 0.0000 $\mu g/m^3$, which is less than the annual ESL for silver of 0.01 $\mu g/m^3$.

191. For zinc, the maximum modeled 1-hour average concentration from the Limestone Station and Limestone Unit 3 project's emissions is 0.085 $\mu g/m^3$, which is below the 1-hour ESL for zinc of 50 $\mu g/m^3$.

192. The maximum modeled annual average concentration resulting from the Limestone Station and Limestone Unit 3 project's emissions of zinc is 0.00054 $\mu g/m^3$, which is less than the annual ESL for zinc of 5 $\mu g/m^3$.

ESL Analysis: Coal Dust

193. For coal dust, the maximum modeled 1-hour average concentration from the Limestone Station and Limestone Unit 3 project's emissions is 14.5$\mu g/m^3$, which is approximately 1.6 times the 1-hour ESL for coal dust of 9 $\mu g/m^3$.

194. The maximum modeled 1-hour average concentration for coal dust is predicted to exceed the 1-hour ESL for only 23 hours per year, at a non-residential location.

195. There were no modeled 1-hour average concentrations for coal dust that exceeded the 1-hour ESL at a non-industrial area.

196. The short-term ESL for coal dust is conservative.

197. The maximum modeled annual average concentration resulting from the Limestone Station and Limestone Unit 3 project's emissions of coal dust is 0.555 $\mu g/m^3$, which is below the annual ESL for coal dust of 0.9 $\mu g/m^3$.

198. No adverse health or welfare effects will result from the public's exposure to emissions of coal dust from the Limestone Station and the Limestone Unit 3 project.

ESL Analysis: Limestone Dust

199. For limestone dust, the maximum modeled 1-hour average concentration from the Limestone Station and Limestone Unit 3 project's emissions is 52.73 $\mu g/m^3$, which is approximately 5 percent greater than the 1-hour ESL for limestone dust of 50 $\mu g/m^3$.

200. The maximum modeled 1-hour average concentration for limestone dust is predicted to exceed the 1-hour ESL for only 1 hour per year, at a non-residential location.

201. There were no modeled 1-hour average concentrations for limestone dust that exceeded the 1-hour ESL at a non-industrial area.

202. The short-term ESL for limestone dust is conservative.

203. The maximum modeled annual average concentration resulting from the Limestone Station and Limestone Unit 3 project's emissions of limestone dust is 0.687 $\mu g/m^3$, which is below the annual ESL for limestone dust of 5 $\mu g/m^3$.

204. No adverse health or welfare effects will result from the public's exposure to emissions of limestone dust from the Limestone Station and the Limestone Unit 3 project.

ESL Analysis: Ammonia

205. For ammonia, the maximum modeled 1-hour average concentration from the Limestone Station and Limestone Unit 3 project's emissions is 398 $\mu g/m^3$, which is approximately 2.3 times the 1-hour ESL for ammonia of 170 $\mu g/m^3$.

206. The maximum modeled 1-hour average concentration for ammonia is predicted to exceed the 1-hour ESL for 22 hours per year, at a non-residential location.

207. There were no modeled 1-hour average concentrations for ammonia that exceeded the 1-hour ESL at a non-industrial area.

208. The short-term ESL for ammonia is conservative.

209. The maximum modeled annual average concentration resulting from the Limestone Station and Limestone Unit 3 project's emissions of ammonia is 7.44 $\mu g/m^3$, which is below the annual ESL for ammonia of 17 $\mu g/m^3$.

210. No adverse health or welfare effects will result from the public's exposure to emissions of ammonia from the Limestone Station and the Limestone Unit 3 project.

ESL Analysis: Vanadium

211. For vanadium, the maximum modeled 1-hour average concentration from the Limestone Station and Limestone Unit 3 project's emissions is 0.877 $\mu g/m^3$, which is approximately 1.8 times the 1-hour ESL for vanadium of 0.5 $\mu g/m^3$.

212. The maximum modeled 1-hour average concentration for vanadium is predicted to exceed the 1-hour ESL for 5 hours per year, at any point off property.

213. The maximum modeled 1-hour average concentration for vanadium at any non-industrial receptor is predicted to exceed the 1-hour ESL by 1.5 times and only for 4 hours per year.

214. The short-term ESL for vanadium is conservative.

215. The maximum modeled annual average concentration resulting from the Limestone Station and Limestone Unit 3 project's emissions of vanadium is 0.005 $\mu g/m^3$, which is below the annual ESL for vanadium of 0.05 $\mu g/m^3$.

216. No adverse health or welfare effects will result from the public's exposure to emissions of vanadium from the Limestone Station and the Limestone Unit 3 project.

ESL Summary

217. No adverse public health or welfare effects will result from the Limestone Station and Limestone Unit 3 project's emission of air contaminants for which no air quality standard exists.

Additional Findings Concerning Air Emissions: Chapter 111 Standards

218. Limestone Unit 3 project stationary vents will not exceed the opacity limit of 20 percent over a six-minute period established in 30 TEX. ADMIN. CODE § 111.111(a)(1)(B).

219. Limestone Unit 3 project fugitive emission sources will not exceed the opacity limit of 30 percent over a six-minute period established in 30 TEX. ADMIN. CODE § 111.111(a)(7) and (8).

220. Limestone Unit 3 project will comply with limits on the emission rate of particulate matter from the auxiliary boiler, engine, and material handling stacks, established under 30 TEX. ADMIN. CODE § 111.151.

221. Emissions of particulate matter from the Limestone Unit 3 project main boiler will not be greater than 0.3 pound total suspended particulates per MMBtu heat input over a two-hour period during solid fuel firing.

222. Emissions of particulate matter from the Limestone Unit 3 project main boiler will not be greater than 0.1 pound total suspended particulates per MMBtu heat input over a two-hour period during natural gas firing.

Summary of Protection of Public Health and Welfare

223. The proposed emissions from the Limestone Unit 3 project will comply with all ambient air contaminant standards and guidelines at off-property locations.

Unregulated Substances

224. Carbon dioxide is not currently subject to regulation under the Federal Clean Air Act and has not previously been subject to regulation.

225. Carbon dioxide is not currently subject to regulation under the Texas Clean Air Act and has not previously been subject to regulation.

226. Neither EPA nor TCEQ has ever issued an air permit with emission limitations for carbon dioxide.

227. NRG's Limestone Unit 3 project will emit some substances that are not presently regulated under the FCAA or the Texas Clean Air Act (TCAA), such as water vapor, nitrogen, methane, ethane, and carbon dioxide.

Measurement of Emissions: 30 TEX. ADMIN. CODE § 116.111(a)(2)(B)

228. NRG will install, operate, and maintain continuous emissions monitoring systems (CEMS) to provide a continuous demonstration of compliance with limits of NO_x, CO, SO_2, mercury, and NH_3 from the Limestone Unit 3 project boiler stack.

229. NRG will install, operate, and maintain a continuous opacity monitoring system (COMS) to provide a continuous demonstration of compliance with the limitation on opacity from the Limestone Unit 3 project boiler stack.

230. NRG will perform initial emission testing; quarterly sample solid fuel heat content and trace metal concentrations; annual stack testing on the boiler for any pollutant not monitored with a CEMS; and undertake other actions at various emission points throughout the Limestone Unit 3 project site to ensure that emissions are within permit limits and comply with the terms of Draft Permit No. 79188 and PSD-TX-1072.

231. NRG's proposed methods for measuring emissions from the Limestone Unit 3 project facilities are adequate to assure compliance with the permit conditions and emissions limitations of Draft Permit No. 79188 and PSD-TX-1072.

232. NRG's permit contains appropriate emissions-measuring provisions for each type of emission from each emission point, with consideration given to the relative significance of each and to any applicable emissions measurement requirements of federal programs such as the New Source Performance Standards (NSPS).

233. NRG's proposed methods for measuring emissions from the Limestone Unit 3 project facilities are adequate to assure compliance with the permit conditions and emissions limitations of Draft Permit No. HAP-14.

Best Available Control Technology (BACT): 30 TEX. ADMIN. CODE § 116.111(a)(2)(C)

234. The TCEQ has provided a guidance document entitled "Evaluating Best Available Control Technology (BACT) in Air Permit Applications," setting forth guidance for evaluation of BACT proposals submitted in a New Source Review air permit application.

235. Under the TCEQ's guidance document, the BACT evaluation is conducted using a tiered analysis approach, involving three different tiers. A Tier I evaluation involves a comparison of the applicant's BACT proposal to emission reduction performance levels accepted as BACT in recent permit reviews involving the same process or industry, with an evaluation of new technical developments necessary in some cases. A 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. A Tier III evaluation is a detailed technical and quantitative economic analysis of all emission reduction options available for the process under review. The guidance document also notes that the Tier III evaluation is rarely necessary because technical practicability and economic reasonableness have usually been firmly established by industry practice as identified in the first two tiers.

236. NRG's BACT analysis included a review of over 40 pulverized coal-fired power plants, of which 10 were located in Texas. Of the total considered, approximately half had draft or final permits dated in 2006 or 2007.

237. In addition to looking at the permits for these other facilities, NRG considered information from vendors and engineering experts on the most realistic emissions limits available with BACT.

238. NRG's BACT analysis in this case was conducted under Tier I only.

239. NRG's BACT analysis was performed in accordance with TCEQ guidance.

240. For the main boiler, NRG will use low-NO_x burners, overfire air and selective catalytic reduction (SCR) to minimize NO_x emissions; a fabric filter baghouse to control emissions of PM and trace metals; a wet limestone flue gas desulfurization (FGD) system to control emissions of SO_2, HCl, HF, and H_2SO_4; the FGD system to control emissions of H_2SO_4; an alkali injection system to control emissions of H_2SO_4 when burning bituminous coal or petroleum coke; good combustion practices to control emissions of CO and VOCs; and NRG will use a combination of the fabric filter baghouse, wet FGD, and SCR, and proposes to install mercury-specific control technology, such as halogen or sorbent addition, to control mercury emissions.

241. For the auxiliary boiler, operation of which will be limited to an annual capacity factor of 10 percent based on heat input, low-NO_x burners and pipeline quality natural gas will be used to minimize NO_x and SO_2 emissions, respectively.

242. For the material handling sources, a combination of fabric filters, covered conveyors, enclosed buildings, and water sprays for dust suppression will be used to control the emissions of PM and PM_{10}.

243. For the emergency generators, operation of which will be limited to 500 non-emergency hours per year each, the use of low sulfur fuel will be used to minimize SO_2 emissions.

244. The emergency engines will meet applicable NSPS for Stationary Compression Ignition Internal Combustion Engines.

245. For the generator cooling tower, PM emissions will be minimized utilizing mist eliminators on the tower and by minimizing total dissolved solids in the cooling water.

246. For the diesel storage tanks, VOC emissions will be minimized by the low vapor pressure of fuel stored in the tanks and by best management practices.

247. For the ammonia handling and storage facilities, ammonia emissions will be minimized by a vapor recovery system, storage in high pressure tanks, daily Audio/Visual/Olfactory inspections to detect leaks, barriers around the storage areas to prevent collisions, and industry-standard leak detection systems.

BACT for Limestone Unit 3

248. Utilization of good combustion practices with an emission rate of 0.12 lb/MMBtu on a 30-day rolling average basis is BACT for CO emissions from Limestone Unit 3.

249. Application of low-NO_x burners, overfire air, and SCR specified to meet NOx emission limits of 0.06 lb/MMBtu over a rolling 30-day average and 0.05 lb/MMBtu over a rolling annual average is BACT for NO_x emissions from the main boiler.

250. Application of a wet FGD system with emission rates of 0.10 lb/MMBtu over a rolling 30-day average and 0.06 lb/MMBtu over a rolling annual average is BACT for SO_2 emissions from the main boiler.

251. Application of fabric filter baghouses with a filterable PM/PM_{10} emission rate of 0.012 lb/MMBtu and a total PM/PM_{10} emission rate of 0.025 lb/MMBtu over a rolling annual average is BACT for PM and PM_{10} emissions from the main boiler.

252. Application of good combustion practices with an emission rate of 0.0036 lb/MMBtu over a rolling annual average is BACT for VOC emissions from the main boiler.

253. Application of a wet FGD system and fabric filter baghouse and an alkali injection system (when burning bituminous coal or petroleum coke) with an emission rate of 0.0075 lb/MMBtu over a rolling annual average is BACT for H_2SO_4 emissions from the main boiler.

254. Application of a wet FGD system and fabric filter baghouse with an emission rate of 0.0005 lb/MMBtu over a rolling annual average is BACT for fluorine emissions (primarily in the form of HF) from the main boiler.

255. Application of a wet FGD system and fabric filter baghouse with an emission rate of 0.0023 lb/MMBtu over a rolling annual average is BACT for HCl emissions from the main boiler.

256. Application of a wet FGD system, SCR, fabric filters, and the use of mercury-specific control technology, such as halogen or sorbent addition, with a sliding scale emissions limit, ranging between 0.012 lb/GWh and 0.015 lb/GWh based upon the fuel burned, is BACT for mercury emissions from the main boiler.

257. Application of a fabric filter baghouse with an emission rate of 0.0000114 lb/MMBtu over a rolling annual average is BACT for lead emissions from the main boiler.

258. Application of best management practices with an emission rate of 10 ppm over a three-hour average is BACT for emissions of ammonia from the main boiler.

Auxiliary Boiler BACT

259. Application of low-NO_x burners to meet 30 parts per million by volume (ppmv) NO_x represents BACT for the auxiliary boiler.

260. Because the boiler is limited by a 10-percent annual capacity limitation, additional controls are not cost effective. Therefore low-NO_x burners and good combustion practices represents BACT for the auxiliary boilers.

Fuel and Material Handling BACT

261. Use of fabric filters, covered conveyors, enclosed buildings and dust suppressant spraying, designed to achieve an emission limit of 0.01 grain PM/dry standard cubic foot, is BACT for emissions of PM/PM_{10} from the fuel and material handling sources.

Emergency Generators BACT

262. Modern diesel engines and limiting non-emergency operations to weekly testing for less than 500 hours per year, along with the use of low sulfur diesel fuel, represents BACT for these diesel engines for emergency generators and fire water pumps.

Cooling Tower BACT

263. Maintaining a low level of dissolved solids in the cooling water and utilizing mist eliminators on the cooling tower is BACT for emissions of PM from the cooling tower.

Diesel Storage Tanks BACT

264. Best management practices and the low vapor pressure of fuel stored in the tanks is BACT for emissions of VOCs from diesel storage tanks.

265. Use of vapor recovery, high pressure storage tanks, and best management practices is BACT for the ammonia handling and storage facilities.

BACT Summary

266. Except as otherwise modified by this order, the emission limitations and controls proposed by NRG and established for Limestone Unit 3 Project facilities are BACT.

NSPS: 30 TEX. ADMIN. CODE § 116.111(a)(2)(D)

267. NRG's application accurately and completely delineates the requirements of all applicable NSPS as they apply to pulverized coal boilers, the auxiliary boiler, storage and handling systems, and the Limestone Unit 3 project generally.

268. The Limestone Unit 3 Project is expected to meet all of the NSPS to which it will be subject.

269. Compliance with all applicable NSPS requirements is a condition of the Draft Permit.

NESHAPs: 30 TEX. ADMIN. CODE § 116.111(a)(2)(E)

270. There are no national emissions standards for hazardous air pollutants (NESHAPs) applicable to facilities of a type comprising the Limestone Unit 3 project.

NESHAPs for Source Categories: 30 TEX. ADMIN. CODE § 116.111(a)(2)(F)

271. The Limestone Unit 3 Project emergency diesel engines are expected to comply with 40 CFR Part 63, Subpart ZZZZ, the requirements for NESHAPs for source categories, or maximum achievable control technology (MACT) standards, for stationary reciprocating internal combustion engines.

272. MACT Subpart DDDDD for Industrial/Commercial/Institutional Boilers and Process Heaters was vacated during the technical review of the permit application and is no longer applicable. The case-by-case MACT application filed by NRG makes a case-by-case MACT demonstration for the auxiliary boiler.

Performance Demonstration: 30 TEX. ADMIN. CODE § 116.111(a)(2)(G)

273. Draft Permit No. 79188/PSD-TX-1072 contains provisions for demonstrating achievement of the performance specified in the application, such as conducting performance testing of emissions from the main boiler and auxiliary boiler stacks, once the Limestone Unit 3 Project is constructed and operating.

274. Provisions for demonstrating achievement of the performance specified in the application will adequately demonstrate performance of Limestone Unit 3 Project facilities.

Nonattainment Review: 30 TEX. ADMIN. CODE § 116.111(a)(2)(H)

275. The Limestone Station is located in Air Quality Control Region 212, which is classified as attainment or not classifiable for all criteria pollutants.

276. Because the Limestone Station is not located in an area that is designated nonattainment for any air contaminant, the Limestone Unit 3 project is not subject to nonattainment review requirements.

PSD Review: 30 TEX. ADMIN. CODE § 116.111(a)(2)(I)

277. As part of Texas' State Implementation Plan, EPA has approved TCEQ's program for using Chapter 116 NSR permits as the vehicle for undertaking the demonstrations required by the federal PSD program.

278. Limestone Station has the potential to emit more than 100 tons of any single regulated air contaminant and The Limestone Unit 3 project has the potential to emit the following pollutants in "significant" quantities as defined in 40 C.F.R. §52.21(b)(23): CO, PM, PM_{10}, VOC, H_2SO_4, and fluorides (as HF).

279. NRG conducted a source impact analysis showing that allowable emissions from the Limestone Unit 3 project will not cause or measurably contribute to air pollution in violation of any NAAQS or PSD increment.

280. NRG conducted an appropriate additional impacts analysis that assessed the potential impairment to visibility, soils, and vegetation as a result of the Limestone Unit 3 project and associated commercial, residential, and industrial growth, and assessed air quality impacts as a result of such growth.

281. The Limestone Unit 3 project will not generate sufficient growth in the area to significantly increase air contaminants from secondary sources.

282. Modeling of the Limestone Unit 3 project's emissions shows concentrations that will be protective of soils and vegetation.

283. The Limestone Unit 3 project will not have adverse impacts on visibility since the nearest Class I area is more than 300 kilometers away and because the project will comply with Chapter 111 limits.

284. Modeling of the Limestone Unit 3 project's impact on visibility in a Class I area is not required because the nearest Class I area is more than 300 km from the site of Limestone Unit 3.

Air Dispersion Modeling or Ambient Monitoring: 30 TEX. ADMIN. CODE § 116.111(a)(2)(J)

285. NRG performed computerized air dispersion modeling in order to demonstrate the air impacts from the Limestone Unit 3 project.

Federal Standards of Review for Constructed or Reconstructed Major Sources of Hazardous Air Pollutants (HAPs): 30 TEX. ADMIN. CODE § 116.111(a)(2)(K) (Case-By-Case MACT)

286. NRG prepared an FCAA § 112(g) Case-by-Case MACT Application and applied for a HAP Major Source Permit to establish case-by-case MACT requirements for the Limestone Unit 3 Project main boiler.

287. NRG submitted a Case-by-Case MACT Application for both Limestone Unit 3 and the Limestone Unit 3 Project auxiliary boiler.

288. NRG performed the Case-by-Case MACT analyses in two steps. In the first step, NRG established the "MACT floor" or the most stringent limitation achieved in practice by the best controlled similar source. In the second step, NRG performed a "beyond the floor" analysis of the other methods for potentially reducing emissions to a greater degree, considering such factors as the cost of achieving such emissions reductions and any non-air quality health and environmental impacts and energy requirements to establish whether further reductions are achievable.

289. Using conservative estimates for output-based limits mandated by Massachusetts Air Pollution Control Regulations and achieved by three bituminous boilers in practice, NRG determined that a mercury emissions limit of 0.0075 pounds per gigawatts-hour (lb/GWh)

has been demonstrated in practice and would represent the "MACT floor" for boilers burning only bituminous coal.

290. The applicable Case-by-Case MACT mercury emission limit for Limestone Unit 3 will vary with the amount of bituminous coal burned. NRG submitted a weighted, output-based emissions limit as the appropriate MACT floor based on the actual blend of subbituminous and bituminous coal burned at Limestone Unit 3. The Case-by-Case MACT mercury emission limit for Limestone Unit 3 is reflected in a sliding scale emissions limit, ranging between 0.012 lb/GWh and 0.015 lb/GWh, based upon the fuel burned. This sliding scale limit represents MACT for Limestone Unit 3.

291. NRG's Case-by-Case MACT Application did not specify a control technology selected by NRG that, if properly operated and maintained, will meet the proposed MACT emission limitations.

292. NRG's Case-by-Case MACT Application did not identify technical information on the design, operation, size, estimated control efficiency of a control technology it intended to use for controlling mercury emissions at Limestone Unit 3.

293. NRG's Case-by-Case MACT Application did not identify supporting documentation including identification of alternative control technologies considered by NRG to meet the proposed emission limitation, and analysis of cost and non-air quality health environmental impacts or energy requirements for the selected control technology.

294. NRG has not identified a specific control technology it intends to use to control mercury emissions at Limestone Unit 3.

295. Filterable PM is an appropriate surrogate pollutant for non-mercury HAP metals because filterable PM and non-mercury HAP metals have common formation mechanisms and control techniques.

296. For non-mercury HAP metals, NRG performed an evaluation of particulate matter emissions controls and recent permit limits and determined that the MACT floor is a filterable particulate matter emission limit of 0.015 lb/MMBtu.

297. NRG performed a "beyond-the-floor" MACT analysis for non-mercury HAP metals and found that advances in fabric filter technology allow for a more-stringent case-by-case MACT emission limit for non-mercury HAP metals of 0.012 lb/MMBtu.

298. For HCl, NRG evaluated recent controls and permit limits and determined that a MACT floor must be established based on a blend by weight of sub-bituminous and bituminous coal. The corresponding worst-case blend containing 60 percent by weight sub-bituminous coal and 40 percent by weight bituminous coal resulted in the establishment of a MACT floor.

299. For HF, a MACT floor of 0.0005 lb/MMBtu was identified.

300. The applicable Case-by-Case MACT emission limit for HCl is 0.0023 lb/MMBtu.

301. The applicable Case-by-Case MACT emission limit for HF is 0.0005 lb/MMBtu.

302. CO is an appropriate surrogate pollutant for organic HAP emissions because CO and organic HAPs have common formation mechanisms and control technologies.

303. It has been EPA's practice to use CO as a surrogate pollutant for organic HAPs when establishing MACT emission limits for combustion sources.

304. The MACT floor for emissions of organic HAPs corresponds to a CO emission limit of 0.15 lb/MMBTu on a 30-day average.

305. A "beyond-the-floor" MACT analysis did not reveal any MACT emission limit more appropriate and the MACT floor represents the most stringent limit achievable for CO, irrespective of cost.

306. Filterable PM is an appropriate surrogate pollutant for HAP non-mercury metal emissions from the Limestone Unit 3 project auxiliary boiler.

307. CO is an appropriate surrogate pollutant for organic HAP emissions from the Limestone Unit 3 project auxiliary boiler.

308. The Case-by-Case MACT emission limit for HAP non-metal metal emissions from the Limestone Unit 3 project auxiliary boiler corresponds to a Filterable PM emission limit of 0.0022 lb/MMBtu.

309. The Case-by-Case MACT emission limit for organic HAP emissions from the Limestone Unit 3 project auxiliary boiler corresponds to a CO emission limit of 0.04 lb/MMBtu.

Mass Emissions Cap and Trade: 30 TEX. ADMIN. CODE § 116.111(a)(2)(L)

310. Limestone Unit 3 will not be located in the Houston/Galveston ozone nonattainment area.

311. No mass cap and trade allowances are applicable to the Limestone Unit 3 project.

Compliance History

312. NRG's compliance history person and site ratings are average.

Permit

313. The maximum allowable emission rate table (MAERT) in the permit lists all sources of air contaminants regulated under the permit.

314. The Limestone Unit 3 project has been planned to comply with the emission limits specified in the permit's MAERT.

315. The Limestone Unit 3 project facilities can be operated to meet the permit requirements.

316. The draft permit prescribes requirements for demonstrating initial and ongoing compliance with all applicable requirements of the permit and the TCAA.

Transcript Costs

317. The non-expedited transcription costs for this case are $6,974.75, which NRG has paid.

318. NRG has the greatest financial ability to pay the transcription costs.

319. NRG presented the greatest amount of witnesses and most evidence of any party during the contested case hearing.

320. Protestants have identified valid deficiencies in NRG's applications.

CONCLUSIONS OF LAW

1. The Commission has jurisdiction over NRG's State Air Quality/PSD Application and Case-by-Case MACT Application pursuant to TEX. HEALTH & SAFETY CODE Chapter 382 and TEX. WATER CODE Chapter 5.

2. NRG's State Air Quality/PSD Application and Case-by-Case MACT Application were directly referred to SOAH pursuant to TEX. WATER CODE § 5.557.

3. Pursuant to TEX. GOV'T CODE § 2003.047, SOAH has jurisdiction to conduct a hearing and to prepare a proposal for decision in this matter.

4. Notice of NRG's application was provided pursuant to 30 TEX. ADMIN. CODE § 39.601, *et seq.*, and TEX. GOV'T CODE §§ 2001.051 and 2001.052.

5. NRG submitted its State Air Quality/PSD Application and Case-by-Case MACT Application pursuant to 30 TEX. ADMIN. CODE §§ 116.110(f) and 116.140.

6. Pursuant to 30 TEX. ADMIN. CODE § 80.17(a), 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 satisfies all statutory and regulatory requirements.

7. Pursuant to 30 TEX. ADMIN. CODE § 116.111, and as modified by and reflected in this order, the emissions from the Limestone Unit 3 project facilities will comply with all Commission rules and regulations and with the intent of the TCAA, including the protection of the health and physical property of the people, consistent with the long-standing interpretation of the Commission's rules, regulations, and guidance.

Protection of Public Health and Welfare

8. A demonstration of compliance with the PM_{10} NAAQS suffices to demonstrate compliance with the $PM_{2.5}$ NAAQS.

9. When the maximum modeled concentration of a pollutant from a project is less than a NAAQS *de minimis* level, it is unnecessary to incorporate background levels or emissions from other sources in the area in the analysis of that pollutant because the maximum predicted concentration level is insignificant.

10. Pre-construction monitoring is not required to evaluate the cumulative impact of the Limestone Unit 3 project's emissions of SO_2 and PM_{10} because of the availability of existing conservative monitoring data.

11. No pre-construction monitoring is required for any of the air contaminants for which NRG's maximum modeled concentrations were below PSD monitoring *de minimis* levels.

12. For NO_2 and CO, pre-construction monitoring is not required because the predicted concentrations of these pollutants are less than their respective PSD monitoring significance levels.

13. The proposed emissions from the Limestone Unit 3 project will not cause or contribute to air pollution.

14. The proposed emissions from the Limestone Unit 3 project will not cause adverse public health or welfare effects, including nuisance conditions.

15. Based on the above Findings of Fact, the proposed emissions from the Limestone Unit 3 project will comply with the opacity limits and particulate matter emission rates set forth in 30 TEX. ADMIN. CODE Chapter 111 concerning control of air pollution from visible emissions and particulate matter.

16. Based on the above Findings of Fact, the proposed emissions from the Limestone Unit 3 project will comply with the sulfur compound emission requirements set forth in 30 TEX. ADMIN. CODE Chapter 112 concerning control of air pollution from sulfur compounds.

17. Based on the above Findings of Fact, NRG will comply with all applicable standards adopted by reference in 30 TEX. ADMIN. CODE Chapter 113.

18. The proposed Limestone Unit 3 project diesel fuel tanks will only store diesel that meets the specifications set forth in 30 TEX. ADMIN. CODE Chapter 114.

19. The Limestone Unit 3 project is not subject to the rules set forth in 30 TEX. ADMIN. CODE Chapter 115 regarding the control of VOCs because it will be located in Limestone County.

20. The Limestone Unit 3 project is not subject to the rules set forth in 30 TEX. ADMIN. CODE Chapter 117 regarding the control of NO_x because it will not be located in an ozone nonattainment area and will be placed into service after December 31, 1995.

21. The Limestone Unit 3 project is required to operate in compliance with any orders of the Commission relating to generalized and localized air pollution episodes under 30 TEX. ADMIN. CODE Chapter 118.

22. The Limestone Unit 3 project is not subject to the emission reduction plan requirements of 30 TEX. ADMIN. CODE Chapter 118.

23. In accordance with 30 TEX. ADMIN. CODE § 116.111(a)(2)(A)(i), emissions from the Limestone Unit 3 project will comply with all Commission rules and regulations and the intent of the TCAA, including protection of the health and property of the public, consistent with the long-standing interpretation of the Commission's rules, regulations, and guidance.

24. Carbon dioxide is not currently subject to regulation under the FCAA or TCAA.

25. NRG is not required to evaluate any impacts from the Limestone Unit 3 project's emissions of substances that are not regulated under the FCAA or TCAA, such as water vapor, nitrogen, methane, ethane, and carbon dioxide.

Measurement of Emissions: 30 TEX. ADMIN. CODE § 116.111(a)(2)(B)

26. In accordance with 30 TEX. ADMIN. CODE §116.111(a)(2)(B), the Limestone Unit 3 project will have provisions for measuring the emission of air contaminants as determined by the Commission's Executive Director.

BACT: 30 TEX. ADMIN. CODE § 116.111(a)(2)(C)

27. An applicant that is proposing to construct a pulverized-coal-fired boiler power plant is not required to include other electric generation technologies, such as integrated gasification/combined cycle (IGCC) technology, in its BACT analysis.

28. In accordance with 30 TEX. ADMIN. CODE § 116.111(a)(2)(C), the Limestone Unit 3 project will utilize BACT, with consideration given to the technical practicability and economic reasonableness of reducing or eliminating emissions from the facilities of which it will be comprised.

NSPS: 30 TEX. ADMIN. CODE § 116.111(a)(2)(D)

29. There will be five types of equipment in the Limestone Unit 3 project that will be subject to five different NSPS: the main boiler; the auxiliary boiler; the coal handling system; the limestone handling system; and the diesel fired emergency generators, including the generator used for the fire water pump. In accordance with 30 TEX. ADMIN. CODE § 116.111(a)(2)(D), the emissions from the Limestone Unit 3 project will meet the requirements of any applicable NSPS as listed under Title 40 C.F.R. Part 60, promulgated by the EPA under authority granted under Section 111 of the FCAA, as amended.

NESHAPs: 30 TEX. ADMIN. CODE § 116.111(a)(2)(E)

30. No requirement set forth at 30 TEX. ADMIN. CODE § 116.111(a)(2)(E) regarding compliance with NESHAPS is applicable to the Limestone Unit 3 project.

NESHAPS for Source Categories: 30 TEX. ADMIN. CODE § 116.111(a)(2)(F)

31. The Limestone Unit 3 project emergency diesel engines are the only type of equipment in the Limestone Unit 3 project subject to a NESHAPs for source categories. In accordance with 30 TEX. ADMIN. CODE § 116.111(a)(2)(F), the emissions from the Limestone Unit 3 project will meet the requirements of any applicable MACT standards as listed under Title 40 C.F.R. Part 63, promulgated by the EPA under authority granted under Section 112 of the FCAA, as amended, or as listed under 30 TEX. ADMIN. CODE Chapter 116.

Performance Demonstration: 30 TEX. ADMIN. CODE §116.111(a)(2)(G)

32. In accordance with 30 TEX. ADMIN. CODE § 116.111 (a)(2)(G) the Limestone Unit 3 project facilities will achieve the performance specified in the permit application.

Nonattainment Review: 30 TEX. ADMIN. CODE §116.111(a)(2)(H)

33. Nonattainment review requirements are not applicable to the Limestone Unit 3 project.

PSD Review: 30 TEX. ADMIN. CODE § 116.111 (a)(2)(I)

34. The Limestone Station is a major source because it emits more than 100 tpy of any single criteria pollutant.

35. The Limestone Unit 3 project constitutes a major modification because it emits certain criteria pollutants in "significant" quantities; therefore, PSD review is triggered.

36. In accordance with 30 TEX. ADMIN. CODE §116.111(a)(2)(I), the Limestone Unit 3 project complies with all applicable requirements of Chapter 116 regarding PSD review.

Air Dispersion Modeling or Ambient Monitoring: 30 TEX. ADMIN. CODE 116. 111(a)(2)(J)

37. In accordance with 30 TEX. ADMIN. CODE § 116.111(a)(2)(J), computerized air dispersion modeling was performed as required to determine the air impacts from the Limestone Unit 3 project and Limestone Station.

HAPs: 30 TEX. ADMIN. CODE § 116.111(a)(2)(K)

38. Limestone Unit 3 will be a major source of HAPs.

39. In accordance with 30 TEX. ADMIN. CODE § 116.111(a)(2)(K), a case-by-case MACT analysis was conducted to establish federally enforceable MACT emission limits for Limestone Unit 3.

40. The application requirements for a case-by-case MACT determination are established in 40 C.F.R. § 63.43(e).

41. Under 40 C.F.R. § 63.43(e)(1), an application for a MACT determination must specify a control technology selected by the owner or operator that, if properly operated and maintained, will meet the proposed MACT emission limitation.

42. Under 40 C.F.R. § 63.43(e)(2)(xi)-(xii), an application for a MACT determination must identify the selected control technology to meet the recommended MACT emission limitation, including technical information on the design, operation, size, estimated control efficiency of the control technology; and supporting documentation including identification of alternative control technologies considered by the applicant to meet the emission limitation, and analysis of cost and non-air quality health environmental impacts or energy requirements for the selected control technology.

43. NRG's Case-by-Case MACT Application is deficient because it did not contain the information required by 40 C.F.R. § 63.43(e)(1) and (2)(xi)-(xii) in regard to mercury emissions control technology.

Mass Cap and Trade Allocations: 30 TEX. ADMIN. CODE 116.111(a)(2)(L)

44. The requirement set forth at 30 TEX. ADMIN. CODE § 116.111(a)(2)(L) is not applicable to the Limestone Unit 3 project.

NRG's Permit

45. The special conditions in the permit are appropriately added under 30 TEX. ADMIN. CODE § 116.115(c)(1) and are consistent with the TCAA.

46. No changes to the permit should be made on the basis of compliance history in accordance with 30 TEX. ADMIN. CODE § 116.110(c), because NRG has an "average" site and person compliance history rating as determined in accordance with 30 TEX. ADMIN. CODE Chapter 60.

47. Based on the above Findings of Fact and Conclusions of Law, NRG has made all demonstrations required under applicable federal and state laws and regulations, including 30 TEX. ADMIN. CODE § 116.111 regarding air permit applications, to be issued an air quality permit with PSD review.

48. In accordance with TEX. HEALTH & SAFETY CODE § 382.0518(b)(1), the Limestone Unit 3 project facilities will use at least BACT, considering the technical practicability and economic reasonableness of reducing or eliminating its emissions.

49. In accordance with 30 TEX. ADMIN. CODE § 116.400, Limestone Unit 3 will employ the maximum achievable control technology (MACT) emissions limitations for a new source.

50. In accordance with TEX. HEALTH & SAFETY CODE § 382.0518(b)(2), emissions from the Limestone Unit 3 project will not contravene the intent of the TCAA and will be protective of the public's health and physical property, consistent with the long-standing interpretation of the Commission's rules, regulations, and guidance.

51. In accordance with TEX. HEALTH & SAFETY CODE §382.0518(b), the application for Air Quality Permit No. 79188/PSD Permit No. PSD-TX-1072 should be approved and Air Quality Permit No. 79188/PSD Permit No. PSD-TX-1072 should be issued.

Transcription Costs

52. All transcription costs should be assessed to NRG.

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

1. The application of NRG Texas Power LLC For State Air Quality Permit No. 79188 and Prevention of Significant Deterioration Air Quality Permit PSD-TX-1072 is approved and the permit attached is approved and issued, with the inclusion of the following special conditions:

   a. Special Condition No. 42: The permit holder will have no net increase in annual site-wide emissions of NO_x, SO_2, and Hg from the Limestone Electric Generating Station upon initial start-up of LMS Unit 3. The reduction of emissions relied upon for ensuring no net increase in annual emissions of NO_x, SO_2, and Hg shall occur no later than initial start-up of the unit. Following the initial start-up of LMS Unit 3, the combined annual NO_x emissions from LMS Unit 1, LMS Unit 2, and LMS Unit 3 shall not exceed a total of 12,056.6 tons per year, and the combined annual SO_2 emissions from LMS Unit 1, LMS Unit 2, and LMS Unit 3 shall not exceed a total of 16,844.8 tons per year, and the combined annual Hg emissions from LMS Unit 1, LMS Unit 2, and LMS Unit 3 shall not exceed a total of 1,084.5 tons per year.

   b. Special Condition No. 43: The permit holder will have no increase in 30-day rolling average site-wide emissions of NO_x from the Limestone Electric Generating Station upon initial start-up of LMS Unit 3. To determine the baseline 30-day rolling average of NO_x emissions which NRG Texas may not exceed, NRG Texas shall use the lowest 30-day rolling average from any consecutive 30-day period within the June-September 2006 or June-September 2007 time periods. NRG Texas shall maintain records demonstrating compliance with this special condition.

c. Special Condition No. 44: The permit holder will install and maintain a fence at the Limestone Station property line or boundary used for the air dispersion modeling demonstration of compliance with NAAQS and PSD Increment and for the State Effect Review for issuance of Permit Nos. 79188 and PSD-TX-1072. Permit holder will also maintain control over access to the Limestone Station property enclosed by the fence.

2. Within 90 days from the date this order is final, NRG Texas shall provide the ED with data reflecting the lowest 30-day rolling average of NO_x emissions from the Limestone Electric Generating Station from any consecutive 30-day period within the June-September 2006 or June-September 2007 time periods, so as to allow determination of the baseline 30-day average of NO_x emissions required by Special Condition No. 43.

3. The application of NRG Texas for a federal Clean Air Act section 112(g) case-by-case maximum achievable control technology (MACT) determination fails to satisfy applicable requirements and is therefore remanded to allow NRG Texas to satisfy the Case-by-Case MACT requirements.

4. NRG shall comply with all Findings of Fact and Conclusions of Law contained herein.

5. NRG shall pay for all transcription and reporting costs associated with this matter.

6. 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.

7. The effective date of this Order is the date the Order is final, as provided by 30 TEX. ADMIN. CODE § 80.273 and TEX. GOV'T CODE § 2001.144.

8. 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.

9. The Executive Director's Response to Public Comment concerning NRG's Air Quality Permit No. 79188 and PSD Permit No. PSD-TX-1072 is adopted and approved. If there is any conflict between the Commission's Order and the Executive Director's Response to Comments, the Commission's Order prevails.

ISSUED:

TEXAS COMMISSION ON
ENVIRONMENTAL QUALITY

Buddy Garcia, Chairman
For the Commission