Identification and Evaluation of Emission Control Measures for Units 3 and 4 at the Springerville Generating Station for Purposes of the Regional Haze Second Planning Period Under 40 CFR § 51.308(f)(2)

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1. Introduction and Background

1.1 Introduction

This report presents an analysis of potential control measures that could be used to achieve emission reductions in visibility-impairing pollutants at Units 3 and 4 at the Springerville Generating Station ("SGS") located in Apache County, approximately 15 miles north of Springerville, Arizona.

SGS comprises four coal-fired electric generating units with a combined, nominal, net generating capacity of 1,620 megawatts ("MWe"). Unit 3 is owned by Tri-State Generation and Transmission Association, Inc., and Unit 4 is owned by the Salt River Project Agricultural Improvement and Power District. Both units are operated by Tucson Electric Power Company ("TEP").

TEP hired RTP Environmental Associates, Inc. ("RTP") to prepare this analysis. The analyses presented herein are provided in response to a request by Arizona Department of Environmental Quality ("ADEQ") to assist in developing a long-term strategy for demonstrating that Arizona is makng reasonable progress under the Regional Haze program as discussed below.

1.2 Statutory and Regulatory Background

The Federal Clean Air Act ("CAA") establishes as a national goal "the remedying of any existing, impairment of visibility in mandatory class I Federal areas which impairment results from manmade air pollution"[1] and requires States periodically to develop plans for making reasonable progress toward meeting the national goal.[2] The statute further requires that, in determining what constitutes reasonable progress, "there shall be taken into consideration the costs of compliance, the time necessary for compliance, and the energy and nonair quality environmental impacts of compliance, and the remaining useful life of any existing source subject to such requirements."[3] These are referred to as the four reasonable progress factors or simply the four factors.

The U.S. Environmental Protection Agency ("EPA") has promulgated prescriptive Federal rules establishing minimum requirements concerning the timing and content of the initial Regional Haze State Implementation Plan ("SIP") for each State and for periodic, comprehensive revisions.[4] Each SIP revision must be submitted to EPA; if it is not approved, then EPA may have authority to develop a Federal Implementation Plan ("FIP") to meet the statutory requirements.[5] ADEQ developed and submitted the initial Regional Haze SIP for Arizona

[1] 42 U.S.C. § 7491(a)(1).
[2] *See generally* 42 U.S.C. § 7491(b)(2).
[3] 42 U.S.C. § 7491(g)(1).
[4] 40 CFR § 51.308.
[5] *See generally* 42 U.S.C. § 7410(c)(1).

addressing reasonable progress for the first implementation period in 2011.[6] This SIP was partially approved and partially disapproved, leading EPA to promulgate a FIP to satisfy some Regional Haze program requirements for Arizona in 2014.[7] EPA determined that no additional controls were required for SGS during the first implementation period.[8]

Regional Haze SIPs establishing a long-term strategy for the second implementation period, which ends in 2028, must be submitted to EPA by July 31, 2021.[9] The State's submittal must include, among other things:

- The enforceable emissions limitations, compliance schedules, and other measures that are necessary to make reasonable progress;[10]
- A description of how the four factors listed in the statute (*i.e.*, costs of compliance, time necessary for compliance, energy and non-air quality environmental impacts of compliance, and the remaining useful life of any existing source) were considered in evaluating and determining the emission reduction measures that are necessary to make reasonable progress;[11]
- A demonstration that the State has included in its SIP all measures agreed to during the State-to-State consultation process or the regional planning process, or measures that will provide equivalent visibility improvement, as well as documentation of the State's consideration of measures that other States identified as necessary to make reasonable progress for their sources;[12]
- Documentation of the technical basis, including modeling, monitoring, cost, engineering, and emissions information, on which the State is relying to determine the emission reduction measures that are necessary;[13] and
- A description of the State's consideration of the five additional factors listed in 40 CFR § 51.308(f)(2)(iv), including the anticipated net effect on visibility due to projected changes in point, area, and mobile source emissions during the planning period.[14]

The objectives and content of the required periodic SIP revisions were summarized succinctly in the 2011 Arizona RH SIP:

> Determine the effectiveness of the long-term strategy for achieving the presumptive goal for the prior SIP period. If the long-term strategy or prior presumptive goal was

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[6] ADEQ, Air Quality Division, *Arizona State Implementation Plan: Regional Haze Under Section 308 of the Federal Regional Haze Rule* (Jan. 2011) https://legacy.azdeq.gov/environ/air/haze/download/haze308sip.pdf ("2011 Arizona RH SIP"). Arizona had previously submitted a Regional Haze SIP under the alternative provisions of 40 CFR § 51.309, but this SIP was never approved by EPA.

[7] 79 *Fed. Reg.* 52420 (Sept. 3, 2014).

[8] *See Id.*; *See* 78 *Fed. Reg.* 46142 (Jul. 30, 2013).

[9] 40 CFR § 51.308(f). Note that this deadline was originally July 31, 2018, and was extended by three years in a recent rulemaking. *See* 82 *Fed. Reg.* 3078 (Jan. 10, 2017).

[10] *See generally* 40 CFR § 51.308(f).

[11] 40 CFR § 51.308(f)(2)(i).

[12] 40 CFR § 51.308(f)(2)(ii).

[13] 40 CFR § 51.308(f)(2)(iii).

[14] 40 CFR § 51.308(f)(2)(iv)(E).

> insufficient to attain natural conditions by 2064, the state/tribe must look at additional or new control measures that may be adopted considering compliance cost, compliance time, compliance energy and non-air quality environmental impacts, and the affected source remaining useful life.[15]

In January 2017, EPA significantly revised the Regional Haze rule, including the provisions that govern implementation of the program during the second planning period and subsequent planning periods.[16] In August 2019, EPA issued guidance for consideration by States in developing Regional Haze SIPs for the second implementation period.[17] In September 2019, EPA released modeling results and a Technical Support Document demonstrating that many Class I areas are already on track to attain natural conditions by 2064, i.e., that those Class I areas are at or below the "glidepath" to natural conditions.[18] That modeling further demonstrates that the majority of Class I areas are below the glidepath when it is adjusted to reflect the impacts of international anthropogenic emissions as provided for in EPA's rules.

ADEQ has recently begun a stakeholder process for development of the Regional Haze SIP for the second implementation period.[19] Neither the CAA nor any Federal or State regulation expressly requires the evaluation of emission reduction measures for individual facilities.[20] However, ADEQ has indicated that it will perform such facility-specific analyses and will consider analyses prepared by the owners and operators of those facilities.[21]

1.3 Facility Background

SGS comprises four coal-fired electric generating units and ancillary equipment such as coal and ash handling. RTP's analysis as documented herein pertains only to the following two coal-fired electric generating units:

Units 3 and 4 at SGS include wall-fired, subcritical steam generating units burning primarily subbituminous coal from the Powder River Basin ("PRB") in Wyoming. Each unit has a nameplate capacity of 458.1 MWe. Unit 3 began commercial operation in 2006 and Unit 4 began commercial operation in 2009.

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[15] *See* 2011 Arizona RH SIP, *supra* note 5, at 211.
[16] 82 *Fed. Reg.* 3078 (Jan. 10, 2017).
[17] U.S. EPA, *Guidance on Regional Haze State Implementation Plans for the Second Implementation Period* (EPA-457/B-19-003) (Aug. 2019) https://www.epa.gov/visibility/guidance-regional-haze-state-implementation-plans-second-implementation-period ("2nd Period Regional Haze Guidance").
[18] U.S. EPA, *Technical Support Document for EPA's Updated 2028 Regional Haze Modeling* (Sept. 2019) www.epa.gov/sites/production/files/2019-10/documents/updated_2028_regional_haze_modeling-tsd-2019_0.pdf.
[19] *See generally*, ADEQ, 2021 Regional Haze SIP Planning, https://azdeq.gov/node/5377.
[20] *See* 82 *Fed. Reg.* 3078, 3088 (Jan. 10, 2017) ("Neither the 1999 RHR nor the revised regulations in this rulemaking require states to conduct four-factor analyses on a source-specific basis…. Thus, the EPA has consistently interpreted the CAA to provide states with the flexibility to conduct four-factor analyses for specific sources, groups of sources or even entire source categories, depending on state policy preferences and the specific circumstances of each state.")
[21] *See, e.g.*, e-mail message from William Barr, ADEQ, to Patrick Fahey, TEP, Aug. 3, 2019.

Unit 3 and Unit 4 are each equipped with fabric filter baghouses for control of particulate matter ("PM") emissions; low-NO_X burners, overfire air systems, and selective catalytic reduction ("SCR") systems for control of nitrogen oxides ("NO_X") emissions; and spray dry absorber ("SDA") systems for control of sulfur dioxide (SO_2) emissions. Representative emission rates with this configuration are discussed in Section 3 herein.

1.4 Analysis Process

The federal Regional Haze rule does not prescribe a methodology which ADEQ must follow in determining the enforceable emissions limitations, compliance schedules, and other measures that are necessary to make reasonable progress; the primary requirements are that the evaluation include consideration of the four factors listed in the statute (*i.e.*, costs of compliance, time necessary for compliance, energy and non-air quality environmental impacts of compliance, and the remaining useful life of any existing source), that the evaluation is supported with adequate documentation, and that the evaluation is reasonable.[22] The analysis presented in this report generally follows the steps outlined in U.S. EPA guidance.[23]

The first step in the analysis for a particular source is to identify the technically feasible control measures for those pollutants that contribute to visibility impairment.[24] EPA guidance indicates that for reasonable progress, a State need only "reasonably pick and justify the measures that it will consider."[25] One potentially informative definition can be found in long-standing U.S. EPA guidance in the context of Best Available Control Technology ("BACT") determinations under the Prevention of Significant Deterioration ("PSD") program, which explains that, for purposes of that program, a technically feasible control measure is one that has been demonstrated to function efficiently on a source or unit that is identical or similar to the source or unit under review.[26]

The second step in the analysis involves development of emissions-related information for the source under review.[27] This includes both a baseline scenario and, for each control measure under consideration, characterization of the emissions reductions and emissions limitations that may be achievable at the source.[28]

The third step in the analysis involves characterization of the cost of compliance for each control measure (*i.e.*, each set of emissions limitations) under consideration.[29] This is the first of the four statutory factors. The analytical approach to cost estimation described in Chapter 2 of Section 1 of U.S. EPA's Air Pollution Control Cost Manual, including the use of the so-called

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[22] *See* 2nd Period Regional Haze Guidance, *supra* note 17, at II.B.3.
[23] *See Id.* at 28-45.
[24] *See Id.* at 28-9.
[25] *Id*. at 29.
[26] *See* U.S. EPA, *Prevention of Significant Deterioration Workshop Manual* (EPA-450/2-80-081) (Oct. 1980) at I-B-6 through I-B-7, https://nepis.epa.gov/Exe/ZyPDF.cgi/2000Z81A.PDF?Dockey=2000Z81A.pdf.
[27] *See* 2nd Period Regional Haze Guidance, *supra* note 17, at 29-30.
[28] *Id.*
[29] *See Id.* at 31.

overnight method for accounting for capital investments, while nonbinding,[30] is generally followed in this evaluation. For certain types of add-on air pollution control equipment, the Control Cost Manual includes recommended methodologies and factors for estimating capital and operating costs.[31] In order to ensure the cost information is meaningful for purposes of evaluating whether any of the control measures under consideration are necessary to make reasonable progress, both absolute costs (*e.g.*, capital costs and total annualized cost) and relative costs (*e.g.*, incremental cost per incremental ton of emission reduction and incremental cost per incremental inverse megameter, or per deciview, of visibility improvement) are presented.[32]

The fourth step in the analysis involves, for each control measure remaining under consideration, characterization of the time necessary for compliance.[33] This is the second of the four statutory factors. EPA has recommended that States consider this factor in making a determination as to when compliance can be achieved, not whether it is necessary to make reasonable progress.[34]

The fifth step in the analysis involves, for each control measure remaining under consideration, characterization of the energy and non-air quality environmental impacts of compliance and the remaining useful life of the source or unit under review.[35] These are the remaining two of the four statutory factors. In the evaluation of whether a particular control measure is necessary to make reasonable progress, these statutory factors may generally be considered as part of a State's characterization of the costs of compliance.[36]

The sixth step in the analysis involves, for each control measure remaining under consideration, characterization of the visibility improvement (*e.g.*, in units of inverse megameters or delta deciviews) that would result from installation and operation of such control measure.[37] Although visibility improvement is not one of the four reasonable progress factors, EPA guidance states expressly that such benefits can be considered as part of a four factor analysis "to inform the determination of whether it is reasonable to require a certain measure."[38] For purposes of determining whether a particular control measure is necessary to make reasonable progress, these potential visibility improvements are considered in relation to the reasonable progress goals.[39]

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[30] *See* 79 *Fed. Reg.* 52420, 52466 (Sept. 3, 2014) (noting that "nothing in the [Regional Haze Rule] requires use of the [Control Cost Manual] for calculating the cost of compliance for [reasonable progress] sources").

[31] Mussatti, David, et. al, U.S. EPA, *EPA Air Pollution Control Cost Manual, Sixth Edition* (EPA/452/B-02-001) (Jan. 2002), https://www3.epa.gov/ttn/ecas/docs/cs1ch2.pdf ("Control Cost Manual"). The sixth edition is the most up-to-date, complete edition of this guidance document. U.S. EPA also is developing and making available on its internet web site individual chapters of the upcoming 7th edition at www.epa.gov/economic-and-cost-analysis-air-pollution-regulations/cost-reports-and-guidance-air-pollution.

[32] *See* 2nd Period Regional Haze Guidance, *supra* note 17, at 29, 31.

[33] *See Id.* at 32.

[34] *See Id.* at 41.

[35] *See Id.* at 33.

[36] *See Id.* at 41-2.

[37] *See Id.* at 16, 35.

[38] *See* 2nd Period Regional Haze Guidance, *supra* note 17, at 34.

[39] *See* 40 CFR § 51.308(f)(2)(iii).

2. Analysis Step 1: Identification of Technically Feasible Control Measures

As discussed in Section 1.4 above, the first step in the reasonable progress analysis for a particular source involves identification of technically feasible control measures for those pollutants that contribute to visibility impairment.

The pollutants emitted by Units 3 and 4 at SGS that have the potential to impair visibility are PM, SO_2, NO_X, volatile organic compounds ("VOC") and ammonia (NH_3).[40] Potential control measures for these pollutants, and the technical feasibility of those measures, are discussed in the following subsections.

2.1 Emissions of PM

2.1.1 Fabric Filter Baghouses

Units 3 and 4 at SGS are already equipped with fabric filter baghouses. As has been recognized by EPA, this is the most effective add-on control technology available for filterable PM emissions.[41]

The baghouses installed at Units 3 and 4 are highly efficient. The projected emissions of filterable PM and total PM10 from Unit 3 in the 2028 baseline scenario, as presented in Section 3 herein, are approximately 0.001 pounds per million British thermal unit ("lb/MMBtu") and 0.013 lb/MMBtu, respectively. Projected emissions of both filterable PM and total PM10 from Unit 4 in the 2028 baseline scenario are less than 0.001 lb/MMBtu. These rates compare very favorably with the lowest emission rates generally viewed as achievable with fabric filter baghouses.[42]

2.1.2 Dry Electrostatic Precipitators

As noted in Section 2.1.1 above, Units 3 and 4 at SGS are already equipped with fabric filter baghouses, which are the most effective add-on control technology available for filterable PM emissions. Because dry electrostatic precipitators ("ESPs") are not superior to fabric filter

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[40] *See, e.g.*, 2nd Period Regional Haze Guidance, *supra* note 17, at 11.

[41] *See, e.g.*, U.S. EPA Region IX, *Arizona Regional Haze Technical Support Document* (Jul. 2012), https://www3.epa.gov/region9/air/actions/pdf/az/arizona-rh-tsd-final.pdf ("AZ RH Technical Support Document") at 27-28, finding that fabric filter baghouse is "the most stringent control technology available" for control of filterable PM emissions from a coal-fired electric generating unit. Where the most effective controls have already been installed, EPA rules and policy generally support the use of a streamlined reasonable progress analysis. For instance, EPA's Guidelines for the best available retrofit technology ("BART") requirement of the regional haze program state that a source need not undergo additional emission control technology review to satisfy BART if the source installed controls to satisfy certain other CAA standards and "major new technologies" had not been developed in the meantime. 70 *Fed. Reg.* 39104, 39163-64 (Jul. 6, 2005). This same concept is reflected in the 2nd Period Regional Haze Guidance, *supra* note 17, at 22-25.

[42] *See* 76 *Fed. Reg.* 58570 (Sept. 21, 2011), proposing to approve North Dakota's Regional Haze SIP with respect to particulate matter emissions from several coal-fired electric generating units, including the use of 0.015 lb/MMBtu to calculate the projected estimate of filterable PM emissions following installation of a new fabric filter baghouse.

baghouses in terms of achievable levels of control, no improvement in control of filterable PM emissions from Units 3 and 4 at SGS through retrofit of ESPs is feasible.

2.1.3 Operation without Selective Catalytic Reduction

Operation with SCR contributes to formation of PM in the exhaust from coal-fired electric generating units, and thus PM reductions could theoretically be obtained by ceasing SCR operation.[43]

As discussed in Section 2.2.2 below, Units 3 and 4 at SGS are required to be equipped with SCR systems for control of NO_X emissions. Eliminating the SCR systems in order to decrease formation of PM is not technically feasible.

2.1.4 Wet Electrostatic Precipitators

Wet ESPs are typically used downstream of wet flue gas desulfurization systems to control sulfuric acid mist emissions on utility boilers firing high-sulfur eastern coals. Because the flue gas temperature is below the sulfuric acid and water saturation temperatures, droplets and other condensable materials in the flue gas, including sulfuric acid, are charged and collected on the ESP plates. In theory, additional control of PM emissions could be achieved at Units 3 and 4 through retrofit of wet ESPs.

Projected total PM10 emissions from Units 3 and 4 in the 2028 baseline scenario, as presented in Section 3 herein, are less than 0.013 lb/MMBtu. These emission rates are consistent with the most stringent limit achieved in practice, or demonstrated to be achievable, at a coal-fired electric generating unit.[44] No quantifiable improvement in control of total PM emissions through retrofit of wet ESPs is feasible.

2.2 Emissions of NO_X

2.2.1 Low-NO_X Burners, Overfire Air, and Other Combustion Controls

Units 3 and 4 at SGS are already equipped with low-NO_X burners and overfire air. These combustion controls are effective, resulting in projected NO_X emissions (including the effect of SCR systems) of approximately 0.08 lb/MMBtu in the 2028 baseline scenario.

2.2.2 Selective Catalytic Reduction Systems

The combination of combustion controls and SCR, which is the existing configuration of Units 3 and 4 at SGS, is the most effective combination of control technologies available for NO_X

[43] *See, e.g.*, ADEQ, *Technical Review and Evaluation of Application for Air Quality Significant Revision No. 63088 to Operating Permit No. 64169*, at 4 (Dec. 2016) http://static.azdeq.gov/permits/63088/63088_tsd_proposed_permit.pdf ("ADEQ's Review of CGS Air Permit").

[44] *See* Wisconsin Department of Natural Resources, *Construction Permit No. 12-SDD-047* issued to Wisconsin Electric Power Company at 6 (Jan. 2013), dnr.wi.gov/cias/am/amexternal/AM_DownloadObject.aspx?id=321028 ("WI Electric Power Construction Permit") (imposing a PM10/PM2.5 emission limit of 0.012 lb/MMBtu as lowest achievable emission rate).

emissions.[45] The facility's Class I Air Quality Permit requires that, at all times when Unit 3 or 4 is in operation, the associated SCR system shall be operated in a manner consistent with good air pollution control practice for minimizing NO_X emissions.

Projected NO_X emissions in the 2028 baseline scenario, as presented in Section 3 herein, are approximately 0.08 lb/MMBtu for both units. It is widely accepted that additional control measures need not be evaluated at units equipped with the most effective controls and achieving these emission rates.[46]

2.2.3 Selective Non-Catalytic Reduction Systems

Units 3 and 4 at SGS are already equipped with SCR systems, which is a more effective add-on technology than SNCR. Improvement in control of NO_X emissions from Units 3 and 4 through retrofit of SNCR systems is not technically feasible.

2.3 Emissions of NH_3

2.3.1 Operation without SCR Systems

As discussed in Section 2.2.2 above, the Class I Air Quality Permit for SGS requires operation of SCR systems for control of NO_X emissions from Units 3 and 4. This causes emissions of ammonia due to ammonia slip. Eliminating the SCR systems in order to decrease ammonia emissions from Units 3 and 4 at SGS is therefore not technically feasible.

2.4 Emissions of SO_2

Units 3 and 4 at SGS are already equipped with SDA systems for control of SO_2 emissions. These systems are efficient, resulting in projected SO_2 emissions of approximately 0.08 to 0.09 lb/MMBtu in the 2028 baseline scenario, as presented in Section 3 herein. These emission rates represent continuous compliance with the applicable SO_2 emission standard of 0.20 lb/MMBtu in

[45] *See, e.g.*, AZ RH Technical Support Document, *supra* note 41, at 52, finding that SCR with low-NO_X burners and overfire air is "the most stringent option" for control of NO_X emissions from a coal-fired electric generating unit.

[46] *See* Andover Technology Partners, *Technical Analysis for Arizona and Hawaii Regional Haze FIPs: Task 9: Five-Factor RP Analyses for TEP Springerville, APS Cholla, TEP Sundt, CalPortland Cement and Phoenix Cement Plants, Andover Technology Partners* (Oct. 3, 2012) www.regulations.gov/contentStreamer?documentId=EPA-R09-OAR-2013-0588-0006&attachmentNumber=4&contentType=pdf (underlying calculations available at www.regulations.gov/contentStreamer?documentId=EPA-R09-OAR-2013-0588-0007&attachmentNumber=48&contentType=excel12book) (last accessed Mar. 12, 2020). ("Springerville power plant has four coal-fired units. Units 3 and 4 have modern controls, and thus this analysis is focused on additional visibilty benefits that could be derived from controls on Units 1 and 2.") Indeed, EPA's Guidelines for the BART requirement of the regional haze program state that a source need not undergo additional emission control technology review to satisfy BART if the source installed controls to satisfy certain other CAA standards and "major new technologies" had not been developed in the meantime. 70 *Fed. Reg.* 39104, 39163-64 (July 6, 2005). This same concept is now reflected in the 2nd Period Regional Haze Guidance, *supra* note 17, at 22-25.

Table 2 to 40 CFR part 63, subpart UUUUU. As provided by EPA guidance, full four-factor analyses evaluating additional control measures are not necessary in these circumstances.[47]

2.5 Emissions of VOC

As discussed in Section 3 herein, projected total VOC emissions from Units 3 and 4 in the 2028 baseline scenario are 0.003 lb/MMBtu. These emission rates are consistent with the most stringent limit achieved in practice, or demonstrated to be achievable, at a coal-fired electric generating unit.[48] No technically feasible control measures for further reductions in VOC emissions from coal-fired electric generating units such as Units 3 and 4 have been identified. In addition, EPA has indicated that it is reasonable for a state to exclude VOC control measures from consideration in developing its long-term strategy "based on the expectation that anthropogenic VOC emissions make only a small contribution to visibility impairment."[49]

[47] *See* 2nd Period Regional Haze Guidance, *supra* note 17, at 23, concluding that these regulatory limits are "low enough that it is unlikely that an analysis of control measures for a source already equipped with a scrubber and meeting one of these limits would conclude that even more stringent control of SO_2 is necessary to make reasonable progress."

[48] *See* WI Electric Power Construction Permit, *supra* note 44, at 18 (imposing a VOC emission limit of 0.0035 lb/MMBtu as lowest achievable emission rate).

[49] *See* 2nd Period Regional Haze Guidance, *supra* note 17, at 12.

3. Analysis Step 2: Emissions Information

As discussed in Section 1.4 above, the second step in the reasonable progress analysis for a particular source involves development of emissions-related information for the baseline scenario and for each control measure under consideration.[50]

Projected emissions for SGS Units 3 and 4 for the 2028 baseline scenario, both as emission factors in units of lb per MMBtu of heat input and annual emissions in units of tons per year, are presented in the table below. Consistent with the direction provided by ADEQ, for each unit and each pollutant, the projected emission factor is calculated as the arithmetic mean of the annual average emission factors for calendar years 2016 through 2018. Projected emissions are calculated using the projected emission factor and the projected annual heat input, where the latter value is calculated as the arithmetic mean of the annual heat input rates for that unit for calendar years 2016 through 2018.[51]

	Units	NO_X	PM (filterable)	PM10 (total)	SO_2	VOC	NH_3
UNIT 3	tpy	1,019	16	159	1,036	41	35
	lb/MMBtu	0.081	0.001	0.013	0.083	0.003	0.003
UNIT 4	tpy	929	9	32	1,039	38	32
	lb/MMBtu	0.081	0.001	0.003	0.091	0.003	0.003

For Units 3 and 4 at SGS, which are equipped with state-of-the-art controls for all visibility-impairing pollutants as discussed in Sections 2.1 through 2.5 above, there are no additional control measures beyond the baseline scenario that warrant further consideration.

It must be emphasized that the projected emissions listed above are nominal projections and are not the emission limits that are achievable with the control measures currently in place. Instead, these emission rates represent long-term observed averages during calendar years 2016 through 2018. If additional emission limits were imposed, those limits would have to be set at levels higher than the values listed above in order to allow for continuous compliance, taking into account averaging period and operational variability.

[50] See *supra* note 27.

[51] *See* e-mail message from William Barr, ADEQ, to Catherine Schladweiler, TEP, Aug. 28, 2019. The NO_X and SO_2 emission factors and annual emission rates presented in this report are higher than those listed in Mr. Barr's email because corrections to the facility's emissions inventories were later made by TEP. *See* e-mail message from Zig Fang, TEP, to Adam Ross, ADEQ, Jan. 23, 2020.

4. Four Factor Analysis

Because Units 3 and 4 at SGS are equipped with state-of-the-art controls for all visibility-impairing pollutants, as discussed in Sections 2.1 through 2.5 above, there are no additional control measures that warrant further consideration in terms of the statutory factors, i.e., economic cost, time necessary for compliance, remaining useful life, and energy and non-air quality environmental impacts. As stated by EPA in the 2nd Period Regional Haze Guidance, it is reasonable to assume for the purposes of efficiency and prioritization that a full four-factor analysis for these well-controlled units would likely result in the conclusion that no further controls are necessary.[52]

[52] *See* 2nd Period Regional Haze Guidance, *supra* note 17, at 23.