

**BEFORE THE ADMINISTRATOR
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

IN THE MATTER OF THE REVISIONS TO)
TITLE V OPERATING PERMIT NO. O-0127-16-V FOR)
)
MILL CREEK GENERATING STATION)
LOUISVILLE, KENTUCKY)
OPERATED BY LOUISVILLE GAS & ELECTRIC COMPANY)
)
ISSUED BY THE LOUISVILLE METRO AIR)
POLLUTION CONTROL DISTRICT)
)
_____)

**SIERRA CLUB’S PETITION TO THE EPA ADMINISTRATOR TO OBJECT
TO ISSUANCE OF THE REVISED TITLE V OPERATING PERMIT FOR THE
MILL CREEK POWER PLANT IN LOUISVILLE, KENTUCKY**

Pursuant to Section 505 of the Clean Air Act, Sierra Club hereby petitions the Administrator of the United States Environmental Protection Agency (“EPA”) to object to the revision of the Title V operating permit No. O-0127-16-V (hereinafter the “Revised Permit,” submitted herewith as Exhibit A) for the Mill Creek Generating Station (“Mill Creek”), located at 14460 Dixie Highway in Louisville, Kentucky, and operated by Louisville Gas and Electric Company (“LG&E” or the “Company”).

By way of background, the Louisville Metro Air Pollution Control District (“LMAPCD”) proposed certain limited revisions to Mill Creek’s Title V operating permit in late 2016, soliciting public comment thereon from December 24, 2016, through January 25, 2017. One of the three proposed significant revisions was to add a rolling 720-hour (*i.e.*, 30-day) average emissions standard for sulfur dioxide (“SO₂”), of 0.20 lb/MMBtu, for each of Mill Creek’s four units. *See* Exhibit A, at 20. The stated purpose of that revision was to address nonattainment of the 1-hour SO₂ National Ambient Air Quality Standard (“NAAQS”) of the Clean Air Act (“CAA”). Sierra Club submitted public comments to LMAPCD on that proposed revision on January 25, 2017 (the “Sierra Club Comments,” submitted herewith as Exhibit B-1 (substantive comments) along with Exhibit B-2 (supporting exhibits thereto)). The Sierra Club Comments objected to the proposed 720-hour rolling SO₂ emissions standard as being unlawful and jeopardizing public health, as discussed below. On February 20, 2017, LMAPCD responded to the Sierra Club Comments (such response hereinafter the “LMAPCD Response,” submitted herewith as Exhibit C), advising that the agency would not be making any changes to the

Revised Permit. On the same day, LMAPCD sent EPA Region 4 staff copies of the Revised Permit, the Sierra Club Comments, and the LMAPCD Response, *inter alia*. EPA's 45-day review period ran from February 21, 2017, through April 6, 2017. EPA gave approval, or acquiesced, to LMAPCD to issue the Revised Permit, with the rolling 720-hour SO₂ standard objected to by Sierra Club.

Sierra Club respectfully submits that the 720-hour rolling SO₂ emissions standard in the Revised Permit jeopardizes the public health and fails to comply with applicable requirements under the Clean Air Act ("CAA"), such that objection by EPA is warranted. *See* 42 U.S.C. § 7661d(b)(1); *see also id.* § 7661d(b)(2) (providing that, if EPA does not object, any person may petition the agency to do so within 60 days after the expiration of EPA's 45-day review period). To be sure, and as recognized in the Sierra Club Comments, there are salutary aspects to the revision, including the intention to fulfill obligations flowing from the EPA's designation of parts of Jefferson County as non-attainment for the SO₂ NAAQS,¹ and the recognition in principle of LG&E's duty to reduce and cap Mill Creek's emissions of SO₂—a dangerous pollutant that, at even relatively low ambient concentrations can cause grave health harms in as little as five minutes. However, as discussed in the Sierra Club Comments, the revision is flawed for at least two significant reasons:

- First, a 720-hour averaging period is an inadequate proxy for the 1-hour standard required under the CAA, given that very brief spikes in SO₂ emissions pose serious health harms. Even supposing some plant's emissions could hypothetically be so steady that a 720-hour limit and a 1-hour standard were fairly interchangeable, Mill Creek is no such plant—as EPA guidance suggests, and as a depiction of Mill Creek's recent emissions plainly illustrates.
- Second, assuming *arguendo* that a 720-hour limit could be adequate at Mill Creek, the specific limit of 0.20 lb/MMBtu is too lax, as it was calculated opaquely and based on a 1-hour figure too high to satisfy the NAAQS—as LMAPCD previously recognized, and also as an independent expert report meanwhile concludes.

The substance of the Sierra Club Comments is set out below; Sierra Club also hereby incorporates by reference those Comments in full (including the exhibits and attachments thereto, which EPA should have previously received from LMAPCD) in this Petition. Additionally, below, Sierra Club responds to the LMAPCD's Response, explaining why that Response is off-base and inadequate to justify the 720-hour rolling SO₂ emissions standard in the

¹ *See* Air Quality Designations for the 2010 Sulfur Dioxide Primary National Ambient Air Quality Standard (Final Rule), 78 Fed. Reg. 47,191, 47,200 (Aug. 5, 2013); *see also* Findings of Failure To Submit State Implementation Plans Required for Attainment of the 2010 1-Hour Primary Sulfur Dioxide National Ambient Air Quality Standard (Final Rule), 81 Fed. Reg. 14,736, 14,738 (March 18, 2016).

Revised Permit. For these reasons, objection by EPA to the Revised Permit remains necessary and proper.

I. The Rolling 720-hour SO₂ Emissions Standard in the Revised Permit Is Unlawful and Jeopardizes Public Health

A. The 1-Hour NAAQS Demands a Short-Term Emissions Limit at Mill Creek

The rolling 720-hour average emissions limitation in the Revised Permit is inadequate to protect the 1-hour standard under the SO₂ NAAQS. The 1-hour standard—roughly 0.14% the length of a 720-hour period—was expressly intended, and is critically necessary, to protect against the significant adverse health impacts posed by brief spikes in SO₂ emissions. Yet such spikes would be effectively permitted by the 720-hour limit. That would not only violate the law; it would endanger public health.

Respiratory exposure to SO₂ in periods *as brief as five minutes* can cause serious harms, including decreased lung function, asthma aggravation, sore throat, wheezing, feelings of suffocation, respiratory and cardiovascular morbidity, and even death (with sustained elevated exposure).² Such effects are more prevalent among sensitive populations, such as people who suffer from asthma (Louisville is one of the most challenging cities for asthmatics³), children, the elderly, and those with cardiovascular or chronic lung diseases (*e.g.*, bronchitis or emphysema)—all of whom are especially sensitive to SO₂ and may be affected by relatively low concentrations. The 1-hour SO₂ NAAQS is thus crucial—keeping in mind that—and fully implemented would prevent 2,300-5,900 premature deaths and 54,000 asthma attacks each year, according to EPA estimates.⁴

To confront the dangers of short-term SO₂ exposure, in 2010 EPA not only lowered the primary NAAQS from 140 parts per billion (“ppb”) to 75 ppb, but also slashed the averaging period for that standard from 24 hours to just one hour.⁵ That standard is evaluated by reference to the 99th percentile of the daily maximum ambient concentration annually—in other words, the

² EPA, *Integrated Science Assessment for Sulfur Oxides—Health Criteria*, EPA/600/R-08/047F, at 5-2-5-5 & Tables 5-1, 5-2 (2008), available at <https://cfpub.epa.gov/ncea/risk/recordisplay.cfm?deid=198843&CFID=82280238&CFTOKEN=13538309>; Primary National Ambient Air Quality Standard for Sulfur Dioxide (Final Rule), 75 Fed. Reg. 35,520, 35,525 (June 22, 2010) (noting the strongest possible finding of causation between SO₂ exposure as brief as five minutes, and respiratory morbidity); Agency for Toxic Substances & Disease Registry, U.S. Dept. of Health & Human Servs., *Sulfur Dioxide (SO₂) CAS 7446-09-5; UN 1079*, at 1, 5-6, available at <http://www.atsdr.cdc.gov/MHMI/mmg116.pdf> (detailing effects).

³ Asthma and Allergy Foundation of America, *Asthma Capitals 2015*, at 2 (2016) (ranking Louisville the 21st-most challenging city for asthmatics), available at <http://www.aafa.org/media/Asthma-Capitals-Report-2015-Rankings.pdf>.

⁴ EPA, *Final Regulatory Impact Analysis (RIA) for the SO₂ National Ambient Air Quality Standards (NAAQS)*, at 5-6, 5-35, Table 5.14 (2010), available at <https://www3.epa.gov/ttnecas1/regdata/RIAs/fso2ria100602full.pdf>.

⁵ 75 Fed. Reg. at 35,521-22, 35,550.

fourth highest daily maximum per year. This means that ambient air quality conditions can be rendered unlawful under the CAA by as few as *four hours* of elevated emissions *over the course of a year*.

Clearly, then, an emissions limit with an averaging period significantly longer than one hour—let alone one *720 times longer*—is highly unlikely to safeguard the intrinsically short-term health standard at issue. That is because spikes in emissions, as may occur with startup or shutdown conditions or temporary malfunctions with scrubbers, can elevate ambient SO₂ levels above that allowed under the NAAQS, yet are not cognized by analysis that averages emissions over a much longer period of time. Rather, the smoothed-out emissions curve that results from such long-term averaging effectively disregards ephemeral (yet harmful) spikes.⁶ Thus, a permit condition that purports to allow such long-term averaging would contravene the CAA and should not be approved.

Sierra Club recognizes that EPA noted in its 2014 *Guidance for 1-Hour SO₂ Nonattainment Area SIP Submissions* (“NSIP Guidance”) that any requested deviation from a 1-hour limit must include an adequate “downward adjustment [from the 1-hour standard] to compensate for the loss of stringency inherent in applying a longer term average limit,” as well as a showing by the permit applicant that it will comply with such limit “in a manner that minimizes the frequency of occasions with elevated emissions and magnitude of emissions on those occasions.”⁷ As a threshold matter, Sierra Club strongly disagrees with the suggestion that longer averaging times reliably protect the 1-hour NAAQS, maintains that such longer-term limit would be both unlawful and deeply unwise for the protection of public health,⁸ and believes such an emission limit would not ultimately survive judicial review.

Nevertheless, assuming for the sake of argument that longer-term averages might be deemed permissible under certain narrow circumstances, Mill Creek’s situation presents no such circumstances. Neither LG&E nor LMAPCD has shown that Mill Creek’s characteristics and the permit conditions together satisfy the stringent elements noted by the NSIP Guidance to possibly justify a longer-term SO₂ standard.

⁶ See, e.g., Exhibit B-2 at 1-10 (EPA Region 5 Comments re Monroe Power Plant Construction Permit, at 1 (February 1, 2012) (“Compliance with emissions limits . . . should be determined based on averaging times consistent with the NAAQS. The SO₂ and NO₂ averaging times of 24-hour and annual, respectively, are much longer than the 1-hour averaging for the NAAQS and consequently, may not be protective of the standards.”) (Exhibit 1 to the Sierra Club Comments); EPA Region 7 Comments re: Sunflower Holcomb Station Expansion Project, at 4 (August 12, 2010) (“To ensure the source does not cause or contribute to a violation of the NAAQS, the emission limits must . . . have the same averaging period, *i.e.*, in this case 1-hour average emission rates for the 1-hour NAAQS.”) (Exhibit 2 to the Sierra Club Comments)).

⁷ NSIP Guidance at 25, 34 (Apr. 23, 2014), *available at* https://www.epa.gov/sites/production/files/2016-06/documents/20140423guidance_nonattainment_sip.pdf; *see generally id.* at 22-36 & Appendices B-D.

⁸ See, e.g., 42 U.S.C. § 7410 (a)(1) (state implementation plans must “provide[] for implementation, maintenance, and enforcement of [primary NAAQS] in each air quality control region); 40 C.F.R. § 50.17(b) (“The 1-hour primary [NAAQS] standard [for SO₂] is met at an ambient air quality monitoring site when the three-year average of the annual (99th percentile) of the daily maximum 1-hour average concentrations is less than or equal to 75 ppb...”); *see also supra* footnote 4 & accompanying text (discussing serious health risks from short-term SO₂ exposure).

For one, the 2009-2014 emissions data on which LG&E based its proposal—that basis being apparent from documents Sierra Club obtained through an open records request to LMAPCD⁹—are not representative of Mill Creek’s current or prospective emissions patterns. Therefore, they do not constitute a reliable basis for the calculations and assurances called for by the NSIP Guidance. To that end, the older dataset utilized by LG&E predates the respective installations of flue gas desulphurization (“FGD”) dry scrubbers on Mill Creek’s units from late-2014 to mid-2016, respectively.¹⁰ Yet with respect to that very situation, EPA has emphasized the importance of selecting representative emissions data in requesting an extended averaging period:

A key element of this step is selection of an appropriate emissions data set. This step is especially important if the attainment plan is expected to involve installation of control equipment or other similarly significant changes in operations. ... For example, *installation and operation of [FGD] equipment, particularly in absence of requirements for continuous operation of the equipment, can lead to an emission distribution in which most emission values are significantly lower but occasional values remain relatively high, thus enlarging the difference between peak emission values and longer term average emission values.* Consequently, if the source being addressed does not currently operate [FGD] equipment but the attainment plan is likely to involve installation and operation of such equipment, then the current emissions profile data for the source *may not provide a suitable representation of the variability of emissions that might be expected* after the attainment plan controls are in place.¹¹

Therefore, because Mill Creek’s pre-scrubber emissions data—a core pillar of LG&E’s extraordinary request—cannot reliably predict the plant’s emissions going forward, LG&E cannot be deemed to have provided adequate assurances of the 720-hour rolling limit’s stringency and protectiveness pursuant to the NSIP Guidance.

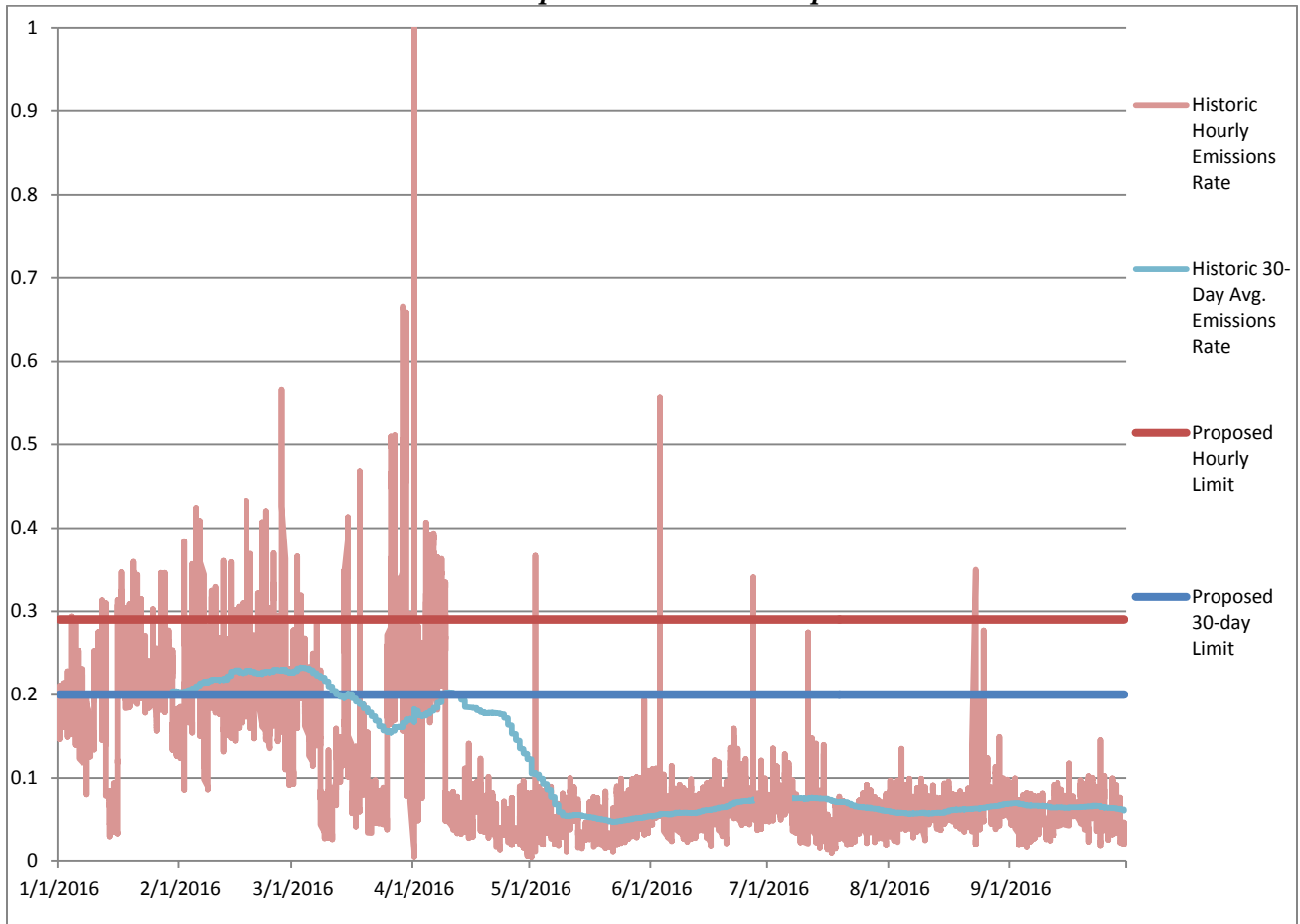
⁹ Sierra Club submitted its open records request to the LMAPCD on January 6, 2017, seeking all records relevant to the proposed permit revisions—expressly including (but not limited to) all data, modeling, methodologies, and any other documents and information relevant to the formulation of the proposed emissions limit. LMAPCD responded with a purportedly exhaustive record production on January 11, 2017. One document therein was an Excel spreadsheet whose data apparently constituted the basis of the proposed 0.20 lb/MMBtu 30-day emissions limit (*see* the Excel document entitled “LG_E Mill Creek 30 day SO2 limit determination with CEMS data,” which Sierra Club provided to LMAPCD for its convenience concurrently with the Sierra Club Comments, and which is submitted herewith as well).

¹⁰ According to the S&P Global Market Intelligence database, also known as SNL, scrubbers were installed and in service at Mill Creek Unit 1 in May 2015, Unit 2 in May 2015, Unit 3 in June 2016, and Unit 4 in December 2014.

¹¹ NSIP Guidance, Appendix C, at C-3 (emphases added); *see also id.* at 30-32 (instructing that requests for longer-term averaging should be based on data from “at least 3 to 5 years of stable operation (*i.e.*, without changes that significantly alter emissions variability),” and explaining that data from the plant generally is not suitable when “implementation of a control strategy might change the source’s expected emissions variability,” in which case data from a facility comparable to the as-altered plant should be used instead).

Moreover and in any event, a visual depiction of Mill Creek’s recent SO₂ emissions starkly illustrates the inability of a 720-hour rolling-average limit to ensure that the critically protective 1-hour NAAQS is met there. As seen in Figure 1, below, 720-hour averaging effectively smooths out instances of excessive 1-hour emissions, which are relatively frequent and substantial at Mill Creek, and results in fewer and less significant exceedances of the 720-hour limit as compared to the 1-hour standard. If enshrined as a permit condition, that method would thus purport to allow Mill Creek to emit unlawful, health-jeopardizing levels of SO₂ more often and more drastically.

Figure 1: Mill Creek Hourly & 30-Day Rolling Avg. SO₂ Emissions (lb/MMBtu): 2016 Historic Rates¹² Compared to Revised/Proposed Permit Limit



Mill Creek’s actual hourly emissions (depicted in pink) frequently exceed the 0.29 lb/MMBtu 1-hour emissions standard on which LG&E based its 720-hour conversion¹³ (the red

¹² Data taken from U.S. EPA Air Markets Program Data, available at <https://ampd.epa.gov/>. Sierra Club submitted that data to LMAPCD as an Excel spreadsheet (entitled “Data for Figures 1 & 2, Sierra Club Comments re Mill Creek”), which Sierra Club likewise submits herewith.

¹³ LG&E identified the 0.29 lb/MMBtu hourly figure as the basis for its calculation of the 0.20 lb/MMBtu 720-hour figure in the Excel spreadsheet that Sierra Club obtained through its open records request. See *supra*, footnote 9 & accompanying text.

line)—indeed, 340 distinct times (*i.e.*, reporting hours) over the course of the first nine months of 2016—and sometimes by an enormous degree. By contrast, Mill Creek’s rolling 30-day average (the turquoise line) exceeded the proposed 0.20 lb/MMBtu 720-hour standard (the blue line) in the Revised Permit far fewer times—fewer than 45 times (*i.e.*, reporting days) over the calculable stretch of eight months—and with much less severity.

The smoothing-out effect inherent to long-term averaging at a plant with substantially variable emissions, like Mill Creek, masks significant hours in which emissions are above safe, lawful levels. Thus, not only would the 720-hour standard effectively allow LG&E to escape otherwise applicable legal liabilities under the NAAQS, but would also pose serious public health risks—keeping in mind that the adverse effects of excessively emitted SO₂ can be caused by exposures as brief as *five minutes*.

By contrast, requiring facilities to observe an hourly averaging period is neither uncommon nor unreasonable. On the contrary, many plants across the country have such a condition in their Title V permit.¹⁴ That makes good sense, after all, because an hourly averaging period is naturally best to ensure an hourly standard, when very-short-term health concerns critically depend on consistent, continuous compliance.¹⁵

In sum, an hourly emission limit should be imposed at Mill Creek to protect the 1-hour NAAQS, rather than attempting to craft a long-term averaging period that plant-specifically unreliable and inadequate, not to mention legally unfounded. If, nevertheless, for some reason EPA remained inclined in this case to permit longer-term averaging for Mill Creek’s SO₂ emissions, EPA should at least require that the averaging period be shortened (*e.g.*, to 24 hours instead of 720 hours). Additionally (or instead), EPA should require imposition of supplemental conditions in the permit that cap the frequency and magnitude of instances in which Mill Creek allowed, under the permit, to exceed the required longer-term hourly average, as EPA’s NSIP Guidance suggests.¹⁶

¹⁴ See, *e.g.*, Exhibit B-2 at 11-43 (Homer City Plan Approval No. 32-00055H (Pennsylvania) at 10 (Exhibit 3 to the Sierra Club Comments); Black Dog Air Emission Permit No. 03700003-011 (Minnesota) at A-10 (excerpt thereof as Exhibit 4 to the Sierra Club Comments); Sherburne Air Emission Permit No. 14100004-004 (Minnesota) at A-16 (excerpt thereof as Exhibit 5 to the Sierra Club Comments).

¹⁵ See, *e.g.*, *supra*, footnotes 2 & 6.

¹⁶ NSIP Guidance, *supra*, at 33-34:

Use of long term average limits is most defensible if the frequency and magnitude of such occasions of elevated emissions will be minimal. Consequently, supplemental limits on the frequency and/or magnitude of occasions of elevated emissions can be a valuable element.... Limits against excessive frequency (*e.g.*, limitations on the number of times the hourly emissions exceed the critical emission value) and/or magnitude of elevated emissions (*e.g.*, an hourly emissions limit, supplementing the longer term limit, which sets a cap on the magnitude of the peak hourly emissions rate) could further strengthen the justification for the use of longer term average limits.”

B. Even if Some 720-hour Rolling Average Limit Were Acceptable, the Figure in the Revised Permit Is Too High to Safeguard the NAAQS

Assuming for the sake of argument that a 720-hour average could adequately protect the 1-hour SO₂ NAAQS, the particular 720-hour figure in Revised Permit, namely 0.20 lb/MMBtu, is not defensible. In calculating that 720-hour average from on a 1-hour starting point, LG&E used a 0.29 lb/MMBtu for the 1-hour starting point figure.¹⁷ However, examining the proposed permit revisions along with the documents provided in response to Sierra Club's open records request, it is unclear how LG&E arrived at that 0.29 lb/MMBtu hourly starting-point figure, or how it can be reconciled with the 0.24 lb/MMBtu hourly requirement that LMAPCD identified in 2015 discussions. Furthermore, a 2014 independent evaluation of Mill Creek's SO₂ emissions, identified below, independently concluded that an even more stringent 0.22 lb/MMBtu hourly standard is actually required to satisfy the NAAQS. Using that 0.22 lb/MMBtu hourly figure in conjunction with LG&E's own conversion factor renders a 720-hour average of only slightly above 0.15 lb/MMBtu. Therefore, in light of the public's inability to discern the basis for LG&E's hourly starting point, the unexplained inconsistency with the District's own prior calculations, and an expert report determining that a substantially lower hourly starting point is required, the proposed permit's 720-hour figure should be decreased significantly (that is, if a longer-term limit were accepted at all).

First, the methodology behind the proposed limit cannot be meaningfully defended based on the public record. The proposed permit revision itself tersely indicates that "KDAQ and [LM]APCD performed AERMOD modeling for attainment of 1-hour SO₂ NAAQS" and that "[b]ased on the modeled critical SO₂ emission rate and an established 30-day vs. 1-hour SO₂ emission ratio, the suggested 30-day average critical emission rate for SO₂ is 0.20 lbs/MMBtu"¹⁸—with no further information about that referenced modeling. Sierra Club accordingly requested all related modeling, data, methodologies, correspondence, and other relevant records from LMAPCD. However, the responsive production of documents was inadequately illuminating: no document identifying, explaining, or defending the modeling protocol, assumptions, or other methodological bases was included.

Perhaps the most illuminating document produced to Sierra Club was an Excel spreadsheet featuring emissions data from 2009-2014 as well as derivations of the plant-wide conversion factor to calculate a 720-hour limit.¹⁹ However, neither that spreadsheet nor any other produced record explained why those particular years were chosen, or explained how LG&E arrived at the 0.29 lbs/MMBtu hourly limit to be multiplied by the conversion factor. Meanwhile, by contrast in regards to that hourly figure, LG&E told LMAPCD in an October 12, 2015, letter:

¹⁷ See *supra* footnotes 9 & 13 (regarding Sierra Club's open records request and LMAPCD's responsive production).

¹⁸ Exhibit A at 20 n.4.

¹⁹ See *supra* footnotes 9 & 13.

It is our understanding from information and data provided by [LMAPCD] that *the modeled critical emission value translates to a limit of 0.24 lbs/MMBtu emitted through each of the Mill Creek boiler exit stacks on a 1-hour basis and is converted to a 30-day rolling average critical emission value of 0.17 lbs/MMBtu through use of procedures included in Appendix C of the [NSIP Guidance].*²⁰

LG&E went on in the letter to ask LMAPCD that a corresponding mass-based, rather than heat-based, rate limitation be included in the permit (a request that was apparently withdrawn or denied). However, no explanation was ever offered in either that correspondence or elsewhere, as far as Sierra Club can discern, as to why LMAPCD's respective calculations of 0.24 lbs/MMBtu for the required hourly limit and 0.17 lbs/MMBtu for a 720-hour average conversion were inappropriately stringent.²¹

Meanwhile, going beyond LMAPCD's own previous calculations, a 2014 independent expert report determined that the hourly emissions rate required to satisfy the NAAQS is actually 0.22 lb/MMBtu. That report—commissioned by Sierra Club from Steven Klafka, P.E., BCEE, of Wingra Engineering, S.C.²² (hereinafter the “Klafka Report”)—features clear, painstaking air modeling impact analysis based on publically available emissions data, geographical and meteorological inputs, and appropriately conservative modeling assumptions in reaching its conclusions. Using the Klafka Report's 0.22 lb/MMBtu hourly figure, in conjunction with the same 0.69 conversion factor that LG&E used in its calculations,²³ results in a 720-hour average allowable rate of only 0.15 lb/MMBtu—25 percent less than the corresponding 0.20 lb/MMBtu figure in the Revised Permit.

Depicted in Figure 2 below is the substantial disparity between the 0.15 lb/MMBtu rate derived in the Klafka Report, on the one hand, and the opaquely-calculated proposed 0.20 lb/MMBtu rate, on the other hand. Plainly, the laxer rate in the Revised Permit would allow Mill Creek to escape what would otherwise be permit violations—and thus to increase the risk of public health harms—by emitting at average levels that would be prohibited under the rate calculated from the Klafka Report's more stringent hourly standard (assuming *arguendo* it were appropriate to convert each hourly standard into a 720-hour standard).

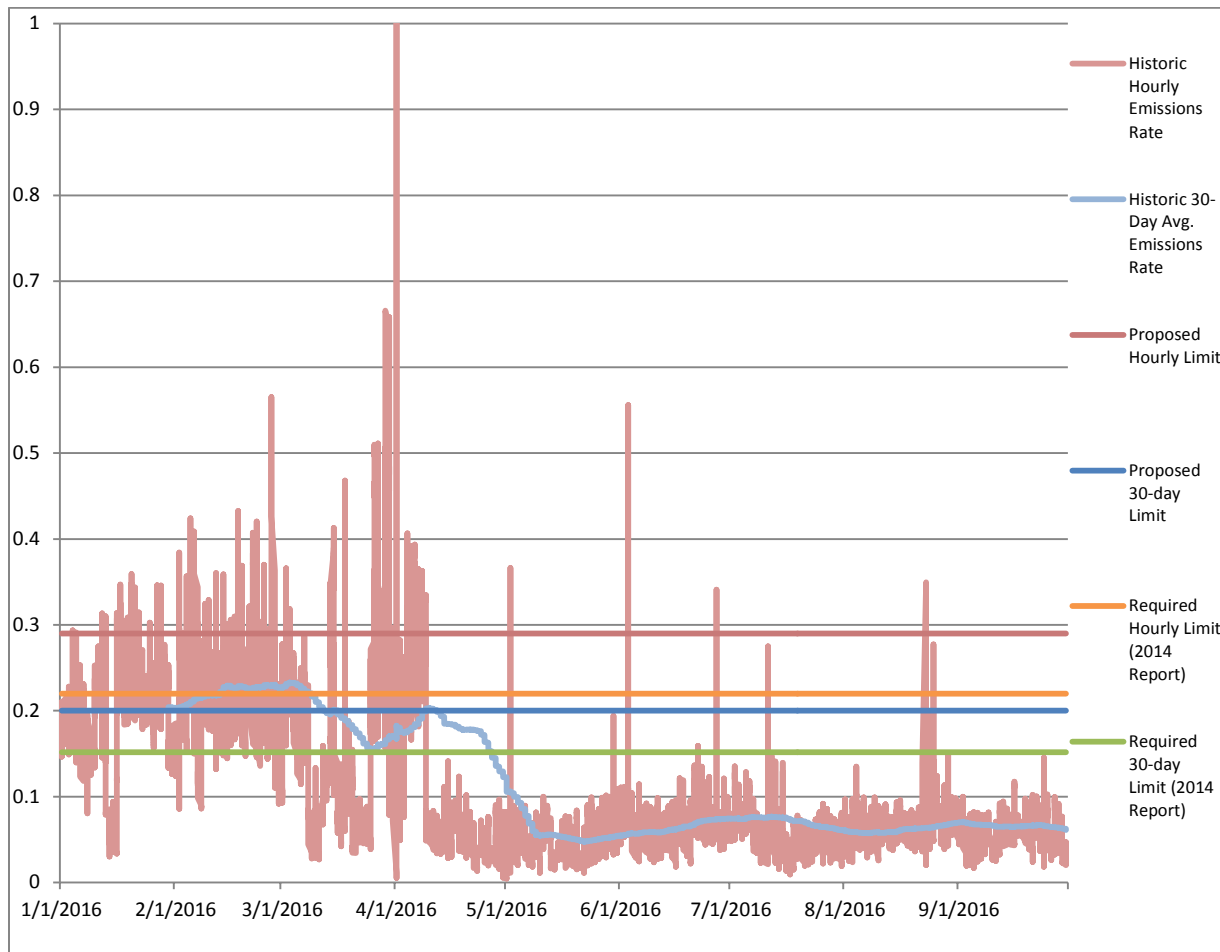
²⁰ See Exhibit B-2 at 44-47 (document “20151015 Correspondence – 127.pdf” at 1 (emphases added), produced in response to Sierra Club's records request (*see supra* footnote 9), attached as Exhibit 6 to the Sierra Club Comments).

²¹ In light of the aforementioned methodological ambiguity, it seems especially coincidental and worth noting that the SO₂ limit LG&E calculated for NAAQS purposes is identical to the limit needed for compliance with its Mercury and Air Toxics Standards (MATS) obligations, which LG&E noted to in its pre-revision comments on Mill Creek's permit, which Sierra Club obtained through its open records request. Exhibit B-2 at 49 (APCD Response to Pre-review Comments for Mill Creek Significant Revision (Exhibit 7 to the Sierra Club Comments) at 1).

²² Exhibit B-2 at 53-65 (Steven Klafka, Mill Creek Generating Station, Louisville, Kentucky: Evaluation of Compliance with the 1-hour NAAQS for SO₂ (Jan. 6, 2014) (Exhibit 8 to the Sierra Club Comments)).

²³ See *supra* footnote 9 (referencing LG&E's Excel spreadsheet, obtained in Sierra Club's open records request). Sierra Club accepts LG&E's conversion factor only for purposes of this calculation; Sierra Club does not endorse the principle of converting 1-hour limits into 720-hour limits.

Figure 2: Mill Creek Hourly & 30-Day Rolling Avg. SO₂ Emissions (lb/MMBtu): 2016 Historic Rates²⁴ Compared to Revised/Proposed Limits vs. Necessary Limits in 2014 Expert Report



II. These Issues Were Timely Raised in Public Comments

As noted above, Sierra Club raised the foregoing objections in the Sierra Club Comments to LMAPCD on January 25, 2017, during the public comment period. *See* Exhibits B-1 and B-2.

III. The State Has Not Justified (and Cannot Justify) Its Approval of the 720-hour SO₂ Emissions Standard in the Revised Permit

None of the reasons offered to defend the Revised Permit in the LMAPCD Response to the Sierra Club Comments justify the 720-hour rolling emissions limit of 0.20 lb/MMBtu

²⁴ Data taken from U.S. EPA Air Markets Program Data, *available at* <https://ampd.epa.gov/>. Sierra Club submitted this data as an Excel spreadsheet to LMAPCD along with the Sierra Club Comments, and likewise submits it herewith. *See supra* footnote 12.

contained in the Revised Permit. *See* Exhibit C. Below, Sierra Club identifies LMAPCD's responses and discusses their chief inadequacies.

Section A

1. The LMAPCD first downplays the link between spikes in SO₂ emissions and spikes in ambient SO₂ concentrations (the latter being what affects health, in the more direct sense) and suggested that that Sierra Club Comments erroneously assume that spikes in emissions above the hourly critical level “will always, or very likely, result[]” in concentrations that exceed the NAAQS. LMAPCD Response at 2. The Sierra Club Comments made no such assumption about emissions “always” or even necessarily “very likely” resulting in NAAQS-exceeding concentrations. In any event, Sierra Club did and continues to emphasize the well-documented meaningful link (to a non-negligible degree) between SO₂ emissions and concentrations (hence the reason emissions are regulated, naturally), and submits that even if emissions spikes result in unsafe, NAAQS-exceeding concentrations on a less frequent (than “always” or “very likely”) yet non-negligible basis, that would still mean that emissions are resulting in unsafe, unlawful SO₂ concentrations on a non-negligible basis. *See* Sierra Club Comments at 2-6; *see also supra* at 3-7. LMAPCD does not deny or confront that. Thus, LMAPCD's exaggeration of Sierra Club's position is a strawman argument, which distracts from the obvious logical and empirically supported conclusion that substantial, recurring, above-critical SO₂ emissions spikes such as those that have occurred at Mill Creek will result in a meaningful number of health-jeopardizing and NAAQS-violating SO₂ concentrations.

In attempt to bolster that strawman argument, LMAPCD cites a single emissions-versus-concentration study conducted at a school “near to” Mill Creek for the proposition that hourly-critical emissions exceedances there resulted in no exceedances of the allowable NAAQS concentration. LMAPCD Response at 3. The relevance and representativeness of were not shown by LMAPCD for the broader principle the study purports to establish by way of extrapolation—for instance, where is/are the relevant monitor/s at the “near[by]” school in relation to Mill Creek, and do local topography and weather patterns make it an accurately representative measurement location? That one study²⁵ does not refute Sierra Club's aforementioned point that, on par, routine above-critical SO₂ emissions spikes will in fact result in a substantial, non-*de-minimis* number of health-jeopardizing and NAAQS-violating SO₂ concentrations—in some places with some health-impacting, unlawful frequency.

2. In its second numbered response, LMAPCD asserts as a matter of principle that above-critical hourly emissions will not necessarily result in NAAQS-violating concentrations, such

²⁵ Sierra Club notes that LMAPCD did not provide this study to Sierra Club in response to its expansive open records request prior to its comments, which prevented Sierra Club from anticipating and responding in comments to LMAPCD's reliance on the study.

that longer-term averaging is acceptable at Mill Creek on the reasoning essentially that its hourly spikes prove harmless. LMAPCD Response at 3. Sierra Club replies with the same essential answer above, which Sierra Club gave in its comments and LMAPCD failed to refute—and notes further that the Sierra Club Comments go on to explain why, even if theoretically some plants have such stable hourly emissions that a longer-term average limitation provided equivalent stringency, Mill Creek is no such plant. *See* Sierra Club Comments at 2-6; *see also supra* at 3-7.

3. LMAPCD next purports to respond to Sierra Club’s criticism that the LG&E’s (and LMAPCD’s) calculations rely on an outdated dataset, since which time the facility has installed different FGD pollution control equipment, such that the older dataset is not reliably predictive going forward—responding by pointing out the existence of some form of FGD scrubbers in those earlier years, and arguing essentially that the replacement of older controls with newer, updated controls makes no meaningful difference for purposes of emissions data predictiveness because both timeframes are still “post-control emissions” generally speaking. LMAPCD Response at 4. LMAPCD acknowledges in the same breath, however, that the new FGD scrubbers operate with different capacities and efficiencies, *id.*, yet fails to defend the appropriateness, in light of those disparate respective operational effects on emissions of the older versus newer technologies in place, of deeming the older emissions dataset as predictive of the newer. Sierra Club submits that such reliance is contrary to EPA guidance and is otherwise inappropriate. Sierra Club Comments at 4-5; *see also id.* at 4-5.
4. LMAPCD then critiques Sierra Club’s use of certain data, in creating its Figure 1 that demonstrates how the smoothing-out effect of longer-term averaging serves to mask emissions exceedances, by asserting that the hourly-critical emissions level of 0.29 lb/MMBtu was “established ... to demonstrate attainment with NAAQS *after* the installation of new FGDs,” such that Sierra Club’s inclusion of emissions from Unit 3 without the installation of the new FGDs was inappropriate; and by further asserting that, excluding such emissions, Mill Creek exceeded that hourly-critical level only five times during an approximate five-month timeframe in 2016. LMAPCD Response at 5; *see* Sierra Club Comments at 5-6; *see also supra* at 5-7. First, however, LMAPCD itself used pre-new-FGD data in arriving at the 0.29 lb/MMBtu hourly-critical level.²⁶ It is disingenuous, then, to fault Sierra Club for looking to supposedly outdated data, when LMAPCD itself arrived at the figure in question by using even older data. Moreover and in any event, the point remains that Mill Creek continues to exhibit a pattern of exceeding the critical emissions level—importantly, exceeding the 720-hour level allowed under the Revised Permit substantially

²⁶ *See, e.g.*, LMAPCD Response at 6 (“0.29 lb/MMBtu demonstrates compliance ... using met data from 2009-2013. These are the same years the CEMs data is drawn from to calculate the 30 day averaging factor. When the CEMs data is updated to 2011-2015, the 30 day averaging factor is unchanged.”).

more often than the 1-hour level, which LMAPCD's response does not acknowledge. That greater number of exceedances allowed under the Revised Permit would thus tend even further to result in NAAQS-exceeding SO₂ concentrations, as discussed above.²⁷

Section B

1. LMAPCD responds to Sierra Club's complaint that it was unable to discern, and thus intelligently comment on, LMAPCD's (or LG&E's) modeling protocol, assumptions, or methodological bases behind the calculations of the hourly critical figure and the corresponding 720-hour conversion (assuming *arguendo* such a conversion were defensible) by stating that it fully responded to Sierra Club's (expansive) open records request, and that "no single document outlines the entire process." LMAPCD Response at 6; *see* Sierra Club Comments at 7; *see also supra* at 8. Sierra Club never contended, however, that a single document needed to do so; rather, its complaint—which goes unanswered—is that *not even all documents in the record altogether* outline the relevant process, assumptions, and methodologies. The point thus stands unrebutted that the public cannot see with meaningful specificity how LMAPCD or LG&E arrived at these figures, and thus cannot meaningfully assess their defensibility. Such opaqueness is contrary to the standards, norms, and public policy of administrative action.
2. Further in the vein of the preceding response, LMAPCD addresses Sierra Club's recognition that the record failed to explain why or how LMAPCD changed its mind to acquiesce to the 0.29 lb/MMBtu hourly limit (not preferred by LG&E) despite earlier stating to LG&E its understanding that a more stringent 0.24 lb/MMBtu level would be the appropriate, necessary hourly figure—purporting to explain that later, higher figure primarily by noting it was arrived at by analyzing emission concentrations only inside the non-attainment area, whereas the earlier, lower figure was arrived at by analyzing data surrounding, as well as inside of, the non-attainment area. LMAPCD Response at 6; *see* Sierra Club Comments at 7; *see also supra* at 8. It is counterintuitive, however, that adding consideration of data from a *less problematic* area (*i.e.*, an area outside the non-attainment area) would have result resulted in needing a *more stringent* emissions limitation; and the point remains that aforementioned lack of clarity in the record behind LMAPCD's protocols, assumptions, and methodologies inhibits exploration of that dubious ambiguity.

²⁷ LMAPCD also includes a paragraph responding to Sierra Club's conclusion at the end of Section A of its comments, LMAPCD Response at 5, but neither that sectional conclusion nor the response thereto raised new points substantively different from those addressed above.

3. Finally, LMAPCD acknowledges that the independent expert analysis commissioned by Sierra Club, the Klafka Report,²⁸ concluded that an even more stringent hourly standard, 0.22 lb/MMBtu, would be necessary to achieve the NAAQS standard, yet responds simply that the discrepancy between that figure and LMAPCD's 0.29 lb/MMBtu figure "may be caused by different input parameters," certain of which were named non-exhaustively. LMAPCD Response at 7; *see* Sierra Club Comments at 8-9; *see also supra* at 8-9. LMAPCD makes no attempt to show, explain, or quantify whether such conceivable discrepancies exist, what their effects would be, and which respective set of methodologies and calculations are more defensible, despite the fact that the Klafka Report's detailed provision of its protocols and assumptions would have allowed such comparative analysis (unlike vice versa, given the relatively opaqueness of LMAPCD's corresponding determination of the hourly figure in question). Rather, LMAPCD simply purports to stand by the validity of its own modeling and conclusions. LMAPCD Response at 7. LMAPCD hence does not even attempt to contradict the Klafka Report's conclusion that a more stringent hourly figure is needed, so Sierra Club's contention to that end remains unrebutted.²⁹

IV. Conclusion

For the foregoing reasons, Sierra Club respectfully submits that LMAPCD should not have granted the health-jeopardizing, unlawful SO₂ emissions limitation set out in Mill Creek's Revised Permit, and requests that EPA object to it accordingly. *See* 42 U.S.C. § 7661d(b).

Dated: June 2, 2017

Respectfully submitted,

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Enclosures

- Exhibit A: Revised Permit (*see supra* at 1)
- Exhibit B-1: Sierra Club Comments (Jan. 25, 2017) (*see supra* at 1)

²⁸ Exhibit B-2 at 53-65; *see supra* footnote 22 & accompanying text.

²⁹ LMAPCD also includes a paragraph responding to Sierra Club's conclusion at the end of Section B of its comments, LMAPCD Response at 7, but neither that sectional conclusion nor the response thereto raised new points substantively different from those addressed above.

- Exhibit B-2: Exhibits previously submitted in support of Sierra Club Comments
- Exhibit C: LMAPCD Response (Feb. 20, 2017) (*see supra* at 1)
- Excel document: “LG_E Mill Creek 30 day SO2 limit determination with CEMS data” (*see* footnote 9, 13 & 23)
- Excel document: “Data for Figures 1 & 2, Sierra Club Comments re Mill Creek” (*see* footnotes 12 & 24)

Submitted to EPA on June 2, 2017, via upload on <http://www.epa.gov/title-voperating-permits/title-v-petitions>. *See id.* (“EPA requests that you file title V petitions electronically through the Central Data Exchange.”); *see also* 81 Fed. Reg. 57,822, 57,833 (Aug. 24, 2016) (proposed rule identifying preferred methods of service).

Service copies sent on June 2, 2017, to: (1) Ms. Eva Addison, LMAPCD (permitting authority); (2) Mr. Bob Ehrler, LG&E (permit applicant). *See* 42 U.S.C. § 7661d(b)(2).