STATE OF NEW MEXICO
ENVIRONMENTAL IMPROVEMENT BOARD

IN THE MATTER OF THE APPEALS OF THE AIR QUALITY PERMIT NO. 7482-M1 ISSUED TO 3 BEAR DELAWARE OPERATING – NM LLC — EIB No. 20-21(A)

AND

REGISTRATION NOS. 8720, 8730, AND 8733 UNDER GENERAL CONSTRUCTION PERMIT FOR OIL AND GAS FACILITIES — EIB No. 20-33(A)

WildEarth Guardians,
Petitioner.

WILDEARTH GUARDIANS' REBUTTAL TESTIMONY

Pursuant to the July 20, 2020 Procedural Order in these matters, consolidated for hearing, WildEarth Guardians ("Guardians") hereby provides the attached written rebuttal testimony from Dr. Ranjit (Ron) Sahu, Ph.D., QEP, CEM (Nevada), and the associated exhibit.

Respectfully submitted this 2nd day of September, 2020,

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CERTIFICATE OF SERVICE

I hereby certify that on September 2, 2020 I filed and served the foregoing **WILDEARTH GUARDIANS' REBUTTAL TESTIMONY** by electronic mail delivery to the following:

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REBUTTAL EXPERT REPORT

by

Dr. Ranajit (Ron) Sahu, Consultant

In support of Petitioner in

EIB No. 20-33(A) and ESB No. 20-21(A)

Previously, I provided an initial Expert Report on this matter on August 3, 2020. In this report I am providing rebuttal to technical issues discussed in the expert reports/testimony by: Dr. Sufi Mustafa and Ms. Elizabeth Bisbey-Kuehn of the New Mexico Environment Department (NMED); and Mr. Randy Parmley, representing XTO. I have also reviewed the testimony provided by Mr. Jeffrey D. Bennett and Ms. Lori K. Marquez representing 3 Bear and those provided by Mr. Todd Mucha, Mr. John Connolly, and Mr. Adam Erenstein representing Spur Energy, but did not find anything in their testimony which addresses the issues I have discussed in my initial expert report – therefore I do not address their testimony in this rebuttal report.

This rebuttal report should be read in conjunction with my initial Expert Report in this matter. As such, unless necessary, I do not repeat all of the introductory and other materials in my initial Expert Report.

Based on my review of the Technical Testimony submitted by NMED and the other parties, the conclusions in my Expert Report remain sound and complete. Further, based on my review of the other parties' testimony, it is clear that:

- The National Ambient Air Quality Standards (NAAQS) for ozone are being violated at monitors in southeastern New Mexico;
- Previous modeling confirms that oil and gas sources of air pollution contribute, often significantly, to ozone concentrations at monitors in southeastern New Mexico;
- With regards to the permit and registrations at issue in this proceeding, NMED did not conduct any analysis of the impacts to ambient ozone concentrations;
- Nevertheless, in its testimony, NMED asserts after-the-fact that the sources at issue in this proceeding would not contribute "significantly" to ground-level ozone NAAQS;
- There is no support for this conclusion and regardless, the standard at issue in this proceeding is whether the sources contribute to violations, not whether the sources "significantly" contribute;
- NMED's development of policy, namely the Ozone Attainment Initiative (OAI), does not suffice to demonstrate the sources at issue in this proceeding would not cause or contribute to violations of the ozone NAAQS; and
- It remains reasonable and justifiable to conclude based on the best available scientific information, both from a quantitative and qualitative standpoint, that permitting of the

sources at issue in this proceeding would contribute to violations of the NAAQS at monitors in southeastern New Mexico.

Below I provide my detailed rebuttal testimony.

I. Rebuttal to Dr. Mustafa's Testimony[1]

As a threshold matter, Dr. Mustafa states that:

> "As the Modeling Unit Manager, I am charged with reviewing and assigning air dispersion modeling analyses that are provided in support of air quality permitting actions. My staff and I ensure that the modeling analyses submitted by permit applicants conform to the most current US EPA modeling guidelines and predict concentrations below applicable ambient air quality standards."[2] (emphasis added)

However, applicants in this case did not submit any ozone modeling analysis so I am not sure as to the relevance of Dr. Mustafa's statement above. With regards to ozone modeling, Dr. Mustafa states the following:

> "In accordance with [EPA's MERPs Guidance], NMED performs ozone modeling on a regional scale as the need arises, rather than requiring permit applicants to quantify their contribution to a regional ozone concentration. Comprehensive ozone modeling is too resource intensive to attach this expense to a typical permit application, and screening modeling on an affordable scale currently cannot quantify a source's impacts to ambient ozone concentrations. (quoting NMED Modeling Guidance, at p. 24.)"[3] (emphasis added)

However, his statement that "NMED performs ozone modeling … as the need arises" implies that NMED does this type of regional modeling as a matter of course. But the agency has not actually conducted regional ozone modeling as oil and gas approvals have exploded in southeastern New Mexico over the past several years. And NMED's recently undertaken modeling effort was only started *after* ozone monitors were demonstrably in violation of the ozone NAAQS, despite the need for such a modeling effort arising several years ago when monitoring data began showing ozone levels within 95% of the NAAQS.

Dr. Mustafa also states that "screening modeling….currently cannot quantify a source's impacts to ambient ozone concentrations." I disagree. In fact, this is plainly incorrect because Dr. Mustafa directly contradicts himself in the very next paragraph in his testimony. He first states:

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[1] Direct Technical Testimony of Sufi Mustafa ("Mustafa Testimony")

[2] Mustafa Testimony, p. 2, lines 13-17.

[3] Mustafa Testimony, p. 7, lines 18-24.

> "…predicting an individual facility's contribution to the ozone levels in a region is extremely difficult compared to the directly emitted pollutants…"[4] (emphasis added)

I note that his previous "cannot quantify" has now become "extremely difficult." That aside, he further states and confirms that screening tools (i.e., Tier I and Tier II modeling) are, in fact, available, providing a simplified approach to quantifying the impact of a facility's emissions on ambient ozone levels:

> "…Tier I is a screening tool under the PSD permitting program that uses Modeled Emission Rates for Precursors ("MERPs"), and Tier II requires the application of photochemical grid models to determine whether the source makes a significant impact on ozone and secondary $PM_{2.5}$. MERPs provide a scaling factor for emissions at a subject facility based on photochemical modeling done for a 'representative facility'. These scaling factors allow precursor emissions to be converted to an estimated ozone concentration based on the atmospheric conditions in the area surrounding the representative facility. The closest representative facilities to Carlsbad and the Permian Basin are located 90 miles to the northwest in Otero County, New Mexico, and 150 miles to the northeast in Terry County, Texas. The scaling factors from both representative facilities indicate that an individual facility would have to emit more than 250 tons per year of both NO_x and VOCs to cause ozone concentrations to increase more than a significant amount (the SIL) of ozone.
>
> Because the allowable emissions from minor sources such as 3-Bear Libby Gas Plant do not, by definition, have the potential to emit NO_x or VOCs in quantities exceeding 250 tons per year, there is no basis for the Department to require further analyses of ozone impacts from such sources. This determination and methodology is in accordance with the EPA Modeling Guidance and the NMED Modeling Guidelines, which does not require source specific ozone modeling for minor sources."[5] (emphasis added)

He goes on to confirm that modeling done at a "representative" facility, can, in fact, be used as part of EPA's MERP guidance to provide screening-level estimates of ozone impacts from individual facilities. I note that there is nothing magical about the MERP approach that restricts it for application only for so-called PSD or major sources. The scaling approach used in MERP can be applied to any facility because it simply uses emissions data for NO_x and VOC to estimate ozone levels. As to Dr. Mustafa's example of 3 Bear noted above, he does not indicate what provisions exist in either EPA's or NMED guidance for minor sources that are located in areas already in violation of the ozone NAAQS, which is the precise issue in this matter. While it may generally seem logical to restrict modeling guidance to larger sources and not smaller ones, that

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[4] Mustafa Testimony, p. 8, lines 16-19.

[5] Mustafa Testimony, p. 9, lines 2-19.

logic fails when there are hundreds of so-called "smaller" sources number all located in or near areas already violating the ozone NAAQS, as confirmed in my initial Expert Report in this matter and also by NMED's Dr. Bisbey-Kuehn as I note later.

Also, in the statement above, Dr. Mustafa states, with no support whatsoever that the two referenced facilities in Otero County, New Mexico and in Terry County, Texas are "representative" for the purposes of MERP analysis. As I discuss later whether a facility is adequately representative is based on specific criteria noted in EPA's guidance that I discuss below. Dr. Mustafa does not discuss these criteria or provide any information regarding these purportedly "representative" facilities. So, his statements that these facilities are "representative" of oil and gas sources is completely unsupported.

With regards to sources that are subject to the general permitting or registrations, Dr. Mustafa states:

> "In the permit hearing before the Board on the GCP O&G, the Department presented testimony regarding the air dispersion modeling analyses that were performed for hypothetical oil and gas facilities to determine conditions under which a permitted facility would be in compliance with applicable ambient air quality standards. Because only minor sources can register under the GCP O&G, the MERP analyses show that the impact of such facilities will be below the ozone SIL, and therefore are not considered to significantly contribute to ozone formation. This determination and methodology is in accordance with the EPA Modeling Guidance and the NMED Modeling Guidelines, which does not require source specific ozone modeling for minor sources."[6] (emphasis added)

However, it is not clear how modeling for ozone for a "hypothetical" source has any bearing on why such modeling can or cannot be done for the actual applications at issue. There are three applications, each with technically allowable NO_x and VOC emissions of 95 tons/year for each pollutant. Collectively, that means the three registrations at issue involve allowable emissions increases of 285 tons/year for each of these ozone precursor pollutants – which is above the threshold at which NMED could definitely have conducted a MERP analysis, following EPA's Tiered process.

In its MERP Guidance, EPA recommends the following three-step process to address ozone (and $PM_{2.5}$ impacts from single sources):

> "1) Identify a representative hypothetical source (or group of sources for an area) from EPA's modeling as detailed in Appendix Table A-1 or the Excel spreadsheet available on SCRAM. If a representative hypothetical source is not available, then consider whether an EPA derived MERP value available for the broader geographic area of the project source may be adequately representative and thus appropriate to use (see Table 4-1). Alternatively, one can consider conducting photochemical

[6] Mustafa Testimony, p. 10, lines 6-13.

modeling (as described in Section 3.2.2) to derive appropriate information to derive a source- or area-specific value.

The permit applicant should provide the appropriate permitting authority with a technically credible justification that the source characteristics (e.g., stack height, emissions rate) of the specific project source described in a permit application and the chemical and physical environment (e.g., meteorology, background pollutant concentrations, and regional/local emissions) near that project source are adequately represented by the selected hypothetical source(s).

2) Acquire the source characteristics and associated modeling results for the hypothetical source(s). If using EPA modeling, then access these data from the on-line spreadsheet on EPA's SCRAM website. If using other modeling, then access these data from the relevant input and output files.

3) Apply the source characteristics and photochemical modeling results from Step 2 to the MERP equation with the appropriate SIL value to assess the project source impacts."[7] (emphasis added)

The second paragraph under 1) above states the specific criteria that should be used to determine the characteristics between the project source and the "representative" source in the MERP guidance – i.e., similar stack heights, generally similar emission rates, similar meteorology, etc. If such representative sources are not available, EPA clearly states that NMED should consider is a MERP value is available for the broader geographic area. Failing that, photochemical modeling should be used.

There is absolutely no indication in the record for the 3 Bear and the registration sources that are the subject of the appeal that NMED conducted any photochemical modeling – or even MERP analysis – prior to issuing these approvals. For example, there is no reference to MERP analysis in NMED's Statements of Basis underlying the separate permit and registration approvals, AR_00785-808 (3 Bear); AR_0222-32 (GCP 8729); AR_0452-61 (GCP 8730); AR_0662-71 (GCP 8733), the agency's formal letter in response to Guardians' comment letter regarding the 3 Bear facility, AR_00809-810, the agency's explanatory document entitled *How Ozone Trends at New Mexico's Ozone Monitoring Stations are Being Addressed*, AR_00811-13, or elsewhere in the administrative record for the 3 Bear Permit or the challenged registrations. The first instance of reference to MERP appears in Dr. Mustafa's testimony. And, as I note above, it is contradictory and unsupported.

Further, the testimony of Dr. Mustafa appears to assume that a MERP analysis estimating a facility's contribution to ozone levels below the Significant Impact Level (SIL) provides conclusive evidence that the facility would not *significantly* contribute to exceedances of the ozone

[7] Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and PM2.s under the PSD Permitting Program, April 30, 2019 ("EPA MERP Guidance"), p. 40-41. Available at https://www.epa.gov/sites/production/files/2019-05/documents/merps2019.pdf

NAAQS. As an initial matter and as noted above, there is nothing in the administrative record actually showing that such a MERP analysis was, in fact, completed before NMED issued the 3 Bear permit or the challenged registrations. Moreover, the language of NMED's regulations does not include a "significance" threshold, but requires permit denial where the facility's emissions would "cause or contribute" to ambient air quality levels in excess of any NAAQS. 20.2.72.208(D) NMAC.

Further, even EPA's *Guidance on Significant Impact Levels for Ozone* does not support a blanket application of SILs as an automatic threshold below which increases in ozone pollution levels are deemed insignificant. (Attached as Exhibit A). As EPA's guidance states, to the extent that permitting authorities may have discretion to apply SILs "on a case-by-case basis in the review of individual permit applications," the use of SILs must be "justified in the permitting record." EPA SIL Guidance, at 1. As EPA acknowledges, the universal application of SILs is legally indefensible, as permitting authorities must retain discretion to require additional analysis in certain circumstances. EPA SIL Guidance, at 2. Accordingly, SIL values are not magic thresholds that the agency can simply blindly rely on, but are tentative, non-binding guidance levels, the appropriateness of which EPA is still evaluating. EPA SIL Guidance at 2. Accordingly, EPA has explained that "[i]f a permitting authority chooses to use these SIL values to support a case-by-case permitting decision, *it must justify the values and their use in the administrative record for the permitting action*." EPA SIL Guidance, at 3. Accordingly, NMED cannot simply rely on EPA's SIL values, but must provide a "*reasoned explanation* for why impacts below that value do not cause or contribute to a violation *in a particular context*." EPA SIL Guidance at 8 (emphasis added). *See also* SIL Guidance at 19 ("The case-by-case use of SIL values should be justified in the record for each permit.").

NMED's failure to explain why application of SILs is appropriate in an area with monitored ozone levels already violating the ozone NAAQS is particularly concerning in light of NMED's Air Dispersion Modeling Guidelines, which provide a simplified formula for estimating ozone concentrations based on the EPA MERP guidance. *See* Air Dispersion Modeling Guidelines, at 24 (attached as Exhibit 3 to NMED's Statement of Intent to Present Direct Technical Testimony). Based on the equation provided in NMED's Air Dispersion Modeling Guidelines, the increased NO_x and VOC emissions from the 3 Bear expansion are estimated to lead to 0.18 ppb increase in ambient ozone concentrations. Given that ozone concentrations in the area are already in violation of the ozone NAAQS of 70 ppb, it is completely arbitrary to suggest that increasing ambient ozone pollution levels by any level, including 0.18 ppb would not cause or contribute to exceedances of the ozone NAAQS. If one uses the total emissions instead of just the increased emissions from 3 Bear, the ozone level per NMED's Dispersion Modeling Guidelines would be 0.97 ppb, just below the 1.0 ppb SIL. Moreover, the collective impact of the three challenged facilities registered under the GCP-O&G, assuming the maximum allowable emissions of 95 tons per year each for NO_x and VOCs is 1.82 ppb of ozone again based on the formula provided in NMED's Air Dispersion Modeling Guidelines. With NMED approving *dozens* of new registrations for oil and gas facilities every month, there is no doubt that emissions from these facilities are contributing to violations of the ozone NAAQS.

Here, NMED has made no attempt to provide a reasoned explanation for why it is appropriate to conclude that additional emissions from the challenged facilities would not contribute to ozone violations, particularly in the context of monitored regional ozone levels already violating the

NAAQS. Accordingly, NMED's after-the-fact attempt to rely on MERP screening (with no actual details) and misuse of EPA guidance regarding Significant Impact Levels for ozone contribution should be set aside.

II. Rebuttal to Ms. Bisbey-Kuehn[8]

I start by acknowledging that Ms. Bisbey-Kuehn confirms my analysis of ambient ozone data monitored in southeast New Mexico as discussed in my initial Expert Report – namely that this monitoring data shows violations of the 2015 ozone NAAQS:

> "Ozone monitoring data for 2017-2019 indicate that other areas of the state are approaching or violating the 2015 ozone NAAQS. In particular, the counties of Eddy, Lea, and the remainder of Doña Ana are monitoring ozone levels in violation of the standard…."[9] (emphasis added)
>
> "The Department acknowledges that the monitors in the Southeastern part of the state are registering design values above the 2015 ozone NAAQS…."[10] (emphasis added)

So, unlike testimony from 3 Bear and XTO experts, it is important to note and confirm the simple fact that monitoring data and resulting design values unambiguously confirm that the 2015 ozone NAAQS is being violated. There are no two ways about this.

Where I part company with Ms. Bisbey-Kuehn is the next step – namely what NMED should be doing about these exceedances and violations. Ms. Bisbey-Kuehn states that the modeling analyses underway pursuant to New Mexico's OAI and the proposed rule-makings pertaining to oil and gas sources, which will all be brought to the Commission later this year, will define the proper path forward. I argue for the common-sense proposition that NMED should not further exacerbate the current violations of the ozone NAAQS by allowing even more precursor NO_x and VOC emissions to be emitted, as would result from continuing to issue permits such as the ones at issue in these appeals – and which will no doubt further increase ozone levels in southeastern New Mexico.

Ms. Bisbey-Kuehn's apparent desire to see the OAI modeling and rule-making process play out is a bit of a red herring, however, because she seems to have already confirmed the conclusions of this modeling that is underway as part of the OAI. She states in her testimony:

> "The oil and gas industry is not the only significant contributor to monitored ozone concentrations in New Mexico; previously conducted regional modeling efforts,

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[8] Technical Testimony of Elizabeth Bisbey-Kuehn ("Bisbey-Kuehn Testimony").

[9] Bisbey-Kuehn Testimony, p. 6, lines 7-9.

[10] Bisbey-Kuehn Testimony, p. 10, lines 3-4.

> including the Southern New Mexico Ozone Study ("SNMOS") completed in 2016, have shown that emissions from onroad mobile sources are the largest New Mexico anthropogenic contribution to the design values at most monitors in southern New Mexico…."[11] (emphasis added)

Based on Ms. Bisbey-Kuehn's testimony, NMED is already preparing to make excuses and point fingers at other sources for southeastern New Mexico's ozone violations and anticipating that proposed new regulations under the OAI are unlikely to bring the region into compliance with the ozone NAAQS. This is perhaps unsurprising given questions that have arisen around draft proposed regulations that NMED has put out for public comment before having any ozone modeling results and that may not result in much, if any, additional regulation of the oil and gas sources that NMED is rapidly permitting.

To support NMED's already predetermined conclusion that oil and gas sources in New Mexico are not the problem and that other activities in other jurisdictions and onroad mobile sources are the problem, Ms. Bisbey-Kuehn relies on the SNMOS as noted in her testimony above. In my initial Expert Report, I provide at least four examples of prior modeling conducted by others (not NMED) which point to the contributions of oil and gas sources as their ozone impacts. These include: a 2013 Modeling Conducted by URS for the Carlsbad Field Office (CFO) of the Bureau of Land Management (BLM)[12]; an analysis of Oil and Gas Impacts by EPA[13]; analysis by the National Park Service (NPS) for Carlsbad Caverns; and the very same 2016 Southern New Mexico Ozone Study (SNMOS)[14] referenced by Ms. Bisbey-Kuehn. A review of the SNMOS, however, does not support Ms. Bisbey-Kuehn's simplistic conclusion which seems to excuse oil and gas sources. Because of its importance, I reproduce my previous discussion of the SNMOS as provided in my initial Expert Report, below.

First, the SNMOS was prepared by Ramboll (the same consultant assisting NMED with the OAI work) and University of North Carolina. Its goal was to study the factors contributing to high ozone levels in Doña Ana county. It used the CAMx photochemical model and used 4-km and 12-km grids in the analysis.

Second, and importantly, while this study was focused on ozone exceedances in Doña Ana county and the apportionment of contributing sources to such exceedances, the SNMOS clearly notes the importance of New Mexico oil and gas emissions. It states:

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[11] Bisbey-Kuehn Testimony, p. 8, lines 1-5.

[12] Exhibit 5 to my Initial Expert Report. URS, Air Resources Technical Support Document, Carlsbad Field Office (CFO), Oil and Gas Resource Management Plan Revision, prepared for the Bureau of Land Management, CFO, and BLM, New Mexico State Office, April 2013.

[13] Exhibit 6 to my Initial Expert Report. Fann, N., et. al., Assessing Human Health $PM_{2.5}$ and Ozone Impacts from U.S. Oil and Natural Gas Sector, Office of Air Quality Planning and Standards, U.S. EPA, Environ Sci Technol. 2018 August 07; 52(15): 8095–8103. doi:10.1021/acs.est.8b02050

[14] Exhibit 7 to my Initial Expert Report. Kemball-Cook, S., et. al., Southern New Mexico Ozone Study, Technical Support Document, October 19, 2016.

"• New Mexico anthropogenic emission sources that contributed the most ozone to New Mexico monitors in the SNMOS 4-km grid were: (1) on-road mobile; (2) offroad mobile; (3) oil and gas; and (4) power plants.

• Oil and gas emissions are the largest New Mexico anthropogenic contribution at the Carlsbad monitor due to its closer proximity to the Permian Basin. The impact of oil and gas sources increases in 2025 due to projected growth in Permian Basin emissions."[15] (emphasis added)

Third, the impact of the Permian sources on Eddy county's Carlsbad monitor is unambiguously discussed in the Draft OAI Modeling Protocol as follows, based on the SNMOS modeling:

"With one exception, onroad Mobile source emissions are the largest contributing source sector in New Mexico to 2011 ozone DVs in southeastern New Mexico with the contribution at the Solano monitoring site being higher than the others. The one exception is the Carlsbad monitoring site in Eddy County where O&G emissions is the largest contributing source sector in New Mexico due to its close proximity to the Permian Basin. Although onroad mobile source emissions are the largest contributor in 2011, it is also the source Sector whose New Mexico ozone contribution is reduced the most in 2025, by over a factor of two. This is in contrast to O&G whose contribution at the Carlsbad monitoring site is projected to increase between 2011 and 2025, although future year projections of O&G emissions are highly uncertain. In any event, by 2025 the SNMOS estimate that on-road mobile, non-road mobile and O&G source sectors in New Mexico will contribute the most…" [16] (emphasis added)

Thus, the SNMOS, in 2016, correctly concluded that oil and gas emissions are the "largest contributing source" to the Eddy County monitor and it also projected increases of ozone at this monitor, which are now being evidenced based on the data I have discussed in my initial Expert Report.

Therefore, for the NMED to deflect, as Ms. Bisbey-Kuehn does in her testimony above and in the quote below, and as it has done in answers to petitioners that it is or may be only natural and distant anthropogenic sources of NO_x and VOC that are responsible for the ozone levels at the Carlsbad (and the other two Eddy and Lea county monitors) is to willfully ignore the clear role of oil and gas sources on ozone levels in southeastern New Mexico.

"While the Department will use its authority to reduce the contribution from New Mexico anthropogenic sources that contribute to ozone design values, contributions from other sources are beyond our control. The aforementioned Southern New Mexico Ozone Study evaluated contributions to design values at monitors in

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[15] *Ibid*., p. 81.

[16] Ramboll and Westar, New Mexico Ozone Attainment Initiative Photochemical Modeling Study – Draft Modeling Protocol, May 2020. ("Draft OAI Modeling Protocol"), p. 11-12.

> southern New Mexico in the base year (2011) and a future year (2025). The most frequent contributors to the design values of the six Doña Ana County monitors were on-road mobile sources (New Mexico, Texas, and Mexico), natural sources (Mexico), electric generating units ("EGUs") (Mexico), non-EGU point sources (Mexico), and oil and gas (Texas). (internal citation omitted). Therefore, it is possible that, even with all the regulatory efforts of the OAI, some areas may not be able to reach or stay in attainment of the ozone NAAQS. In that case, the regulatory path will be a formal nonattainment designation by EPA, with attendant demonstrations by the Department showing that the primary causes of such nonattainment are outside of the State's control either because they are due to natural events/conditions or interstate and international transport."[17] (emphasis added)

This testimony indicates that NMED does not intend to rely on its modeling effort to guide a robust regulatory response designed to bring regional ambient air quality back into compliance with the ozone NAAQS. Nor does the agency intend to evaluate the effectiveness of its proposed new regulatory efforts and consider a more robust regulatory response if current efforts are insufficient. Instead, the agency appears to be preparing to blame sources outside of the State's control if its current regulatory approach proves inadequate and ozone NAAQS violations continue. It is distressing that Ms. Bisbey-Kuehn, charged with ensuring that NMED's regulations and air quality permitting scheme are sufficient to protect air quality and human health, has undermined current ozone modeling underway by already reaching a pre-determined conclusion absolving or minimizing the role of oil and gas sources in southeastern New Mexico for the region's high ozone levels.

III. Rebuttal to Mr. Parmley[18]

Most of Mr. Parmley's testimony deals with legal matters, which I therefore do not address. However, he has two technical conclusions, numbered 3 and 4 in his testimony which I do address below.

Mr. Parmley's conclusion #3 is as follows:

> "3) Ozone formation photochemistry is a complex process and ozone mitigation strategies leading to ozone reduction rulemaking needs to be based on the best available analyses possible. Without a robust ozone model, it is not known if the NO_x and VOC precursors authorized by these oil and gas sources will have any impact on the days for which highest ozone monitoring values occurred. As such, it is not reasonable to conclude that these sources will be unable to comply with the

[17] Bisbey-Kuehn Testimony, p. 9, line 12 – p. 10, line 2.

[18] Direct Testimony of Mr. Randy Parmley, P.E., on behalf of XTO Energy Inc., in Support of General Construction Permit, Oil and Gas Registration Nos. 8729 and 8730, August 3, 2020 ("Parmley Testimony").

> GCP on the basis of these sources being located in a county where monitors are registering design values over the NAAQS."[19]

I point to my rebuttal of Ms. Bisbey-Kuehn above, especially the discussion of the SNMOS pertaining to the impact of oil and gas sources on the ozone monitors in southeastern New Mexico, including the Carlsbad monitor. That same specific rebuttal, relying on actual modeling of the area in 2016 when oil and gas sources were far fewer than currently, shows that the oil and gas industry is the most important anthropogenic source of emissions contributing to ozone levels in Carlsbad, thereby directly refuting Mr. Parmley's generalized, fact-free conclusion above.

Mr. Parmley's conclusion #4 is as follows:

> "4) Ozone modeling must be done on a regional basis in order to address source-specific mitigation from industry sources, mobile sources, nonanthropogenic sources (fires, lightning, stratospheric intrusion), and ozone transport issues. Only through these complex studies can a regulator implement measures that will maintain ambient concentrations below the NAAQS. It appears that the NMED is already implementing studies aimed at developing a comprehensive and meaningful regulatory framework. In my opinion, this established process should be allowed to continue, rather than making arbitrary decisions aimed at specific GCPs in the absence of sound scientific investigation."[20]

Again, ozone modeling has been done on a regional basis – see the SNMOS study and the others I have discussed in my initial Expert Report – and those studies point directly to oil and gas sources, as contributors to ozone violations in Lea and Eddy counties. Again, Mr. Parmley's generalized conclusion above, unsupported by anything but hand-waving, stands refuted.

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[19] Parmley Testimony, p. 20.

[20] Parmley Testimony, p. 20-21.

Exhibit A

U.S. EPA, Guidance on Significant Impact Levels for Ozone and Fine Particles in the Prevention of Significant Deterioration Permitting Program (Apr. 17, 2018)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

APR 17 2018

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

MEMORANDUM

SUBJECT: Guidance on Significant Impact Levels for Ozone and Fine Particles in the Prevention of Significant Deterioration Permitting Program

FROM: Peter Tsirigotis
Director

TO: Regional Air Division Directors, Regions 1-10

The purpose of the attached document is to provide guidance on compliance demonstration tools for use with ozone and fine particles ($PM_{2.5}$) in the Prevention of Significant Deterioration (PSD) permitting program. The Environmental Protection Agency (EPA) has developed a new analytical approach and has used it to identify a significant impact level (SIL) for each ozone and $PM_{2.5}$ National Ambient Air Quality Standard (NAAQS) and for the $PM_{2.5}$ PSD increments. Permitting authorities may use these values to help determine whether a proposed PSD source causes or contributes to a violation of the corresponding NAAQS or PSD increments. Separately, we have developed a technical document that provides a detailed discussion of the technical analysis used in the development of these values and a legal memorandum that provides further detail on the legal basis that permitting authorities may choose to adopt to support using SILs to show that requirements for obtaining a PSD permit are satisfied.[1] This guidance provides a summary of the results of the technical analysis and information on the particular points in the PSD air quality analysis at which permitting authorities may decide to use these values on a case-by-case basis in the review of PSD permit applications. This guidance, and the technical and legal documents, are not final agency actions and do not create any binding requirements on permitting authorities, permit applicants or the public.

Please share this guidance with permitting authorities in your Region. If you have questions regarding the guidance, please contact Raj Rao at *rao.raj@epa.gov* or (919) 541-5344. For questions regarding the technical document, please contact Tyler Fox at *fox.tyler@epa.gov* or (919) 541-5562. For questions regarding the legal document, please contact Brian Doster at *doster.brian@epa.gov* or (202) 564-1932.

Attachment

[1] "Technical Basis for the EPA's Development of Significant Impact Thresholds for $PM_{2.5}$ and Ozone," EPA-454/R-18-001, April 2018; "Legal Memorandum: Application of Significant Impact Levels in the Air Quality Demonstration for Prevention of Significant Deterioration Permitting under the Clean Air Act," April 2018.

Attachment

Guidance on Significant Impact Levels for Ozone and Fine Particles in the Prevention of Significant Deterioration Permitting Program

I. INTRODUCTION

When a Prevention of Significant Deterioration (PSD) permit applicant has shown through air quality modeling that the projected air quality impact from a proposed source for a particular pollutant is not significant or meaningful, the EPA believes there is a valid analytical and legal basis in most cases for the permitting authority to conclude that the proposed source will not cause or contribute to a violation of a National Ambient Air Quality Standard (NAAQS) or PSD increment for that pollutant. To show that the proposed source will not have a significant or meaningful impact on air quality, permit applicants and permitting authorities may elect to use these Significant Impact Level (SIL) values (air quality concentration values) as a compliance demonstration tool. In this guidance and accompanying documents, the EPA has provided policy, technical and legal analyses that permitting authorities may choose to adopt in supporting the use of the SILs to make the required demonstration in particular PSD permitting actions. The use of SILs can help satisfy PSD requirements while expediting the permitting process and conserving resources for permit applicants and permitting authorities.

The EPA has previously issued guidance describing particular uses of SILs.[1,2,3,4] The EPA has also recognized that permitting authorities have the discretion to apply SILs on a case-by-case basis in the review of individual permit applications, provided such use is justified in the permitting record.[5] In an effort to reduce the need for case-by-case justification by permitting authorities, the EPA finalized a rule in 2010 to codify, among other things, particular $PM_{2.5}$ SIL values and specific

[1] Memorandum from Stephen D. Page, EPA OAQPS, to EPA Regional Air Division Directors, "Guidance Concerning the Implementation of the 1-hour SO_2 NAAQS for the Prevention of Significant Deterioration Program," August 23, 2010.
[2] Memorandum from Stephen D. Page, EPA OAQPS, to EPA Regional Air Division Directors, "Guidance Concerning the Implementation of the 1-hour NO_2 NAAQS for the Prevention of Significant Deterioration Program," June 29, 2010.
[3] Memorandum from Stephen D. Page, EPA OAQPS, to OAQPS Personnel and EPA Regional Modelers, "Modeling Procedures for Demonstrating Compliance with $PM_{2.5}$ NAAQS," March 23, 2010.
[4] Memorandum from Gerald A. Emison, EPA OAQPS, to Thomas J. Maslany, EPA Air Management Division, EPA Region 3, "Air Quality Analysis for Prevention of Significant Deterioration (PSD)," July 5, 1988.
[5] Order Responding to Petitioner's Request that the Administrator Object to Issuance of a State Operating Permit, *In the Matter of CF&I Steel, L.P. dba EVRAZ Rocky Mountain Steel*, Petition Number VIII-2011-01, at 15-17 (May 31, 2012) (*"Rocky Mountain Steel Order"); In re: Mississippi Lime Company*, 15 E.A.D. 349, 375-379 (Environmental Appeals Board (EAB) 2011).

applications of those values ("2010 rulemaking").[6] However, in the course of subsequent litigation over this rule, the EPA conceded the regulation was flawed because it did not preserve the discretion of permitting authorities to require additional analysis in certain circumstances, and the court granted the EPA's request to vacate and remand the rule so that the EPA could address the flaw.[7]

Following the litigation, the EPA began developing a new rule to address the flaw identified in the 2010 rulemaking.[8] However, after further evaluation and the identification of a revised set of SIL values based on the technical and legal analyses described below, the EPA believes it should first obtain experience with the application of these values in the permitting program before establishing a generally applicable rule.[9] Thus, the EPA intends at this point to take a two-step approach.

First, the EPA is providing non-binding guidance so that we may gain valuable experience and information as permitting authorities use their discretion to apply and justify the application of the SIL values identified below on a case-by-case basis in the context of individual permitting decisions. We will be seeking to learn generally about permitting agencies' experiences in applying SILs in particular PSD permitting decisions. We will also be seeking more specific information, including how often and in what types of settings the application of a SIL at the single-source assessment and cumulative assessment stages of the PSD air quality analysis has made a critical difference in whether a conclusion was reached that the proposed source will not cause or contribute to a NAAQS or PSD increment violation. The EPA intends to obtain this information through its own PSD permitting activities in states that do not have SIP-approved PSD programs, regular discussions between our Regional offices and air agencies, regular conference calls with the permitting committees of national organizations of air agencies, and technical conferences of air quality modelers and others interested in permitting activities.

Second, the EPA will use this experience and information to assess, refine and, as appropriate, codify SIL values and specific applications of those values in a future, potentially binding rulemaking. During this second step, to assess whether it is appropriate to codify particular SIL

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[6] 75 FR 64864 (October 20, 2010).

[7] *Sierra Club v. EPA*, 705 F.3d 458, 463-66 (D.C. Cir. 2013). In its litigation brief at n. 10, the EPA stated an intent to issue guidance in the near future concerning $PM_{2.5}$ values remaining in 40 CFR 51.165(b)(2). The EPA issued such guidance in May 2014. Memorandum from Stephen D. Page, EPA OAQPS, to EPA Regional Air Division Directors, "Guidance for $PM_{2.5}$ Permit Modeling," May 20, 2014.

[8] Fall 2015 Regulatory Agenda, USEPA, 80 FR 78024, December 15, 2015. Ozone and Fine Particulate Matter ($PM_{2.5}$) Significant Impact Levels (SILs) for Prevention of Significant Deterioration (PSD), RIN: 2060-AR28. *http://www.reginfo.gov/public/do/eAgendaViewRule?pubId=201510&RIN=2060-AR28.*

[9] *See SEC v. Chenery Corp.,* 332 U.S. 194, 199-203 (1947) (recognizing that some principles may warrant further development before they are ready to be codified in a rule of general applicability).

values for ozone and $PM_{2.5}$, the EPA will consider whether permitting experience has confirmed that the recommended SIL values are suitable in all circumstances to show that an increase in air quality concentration below the value does not cause or contribute to a violation of the NAAQS or PSD increments.

Permitting authorities retain discretion to use or not to use these EPA-derived SILs in particular PSD permitting actions. If a permitting authority chooses to use these SIL values to support a case-by-case permitting decision, it must justify the values and their use in the administrative record for the permitting action.[10] Permitting authorities also have discretion to develop their own SIL values, provided that such values are properly supported in the record for permitting actions or decisions in which the values are used to make the required showing. Detailed technical guidance on the development of alternative SIL values is beyond the scope of this document; however, we provide a limited discussion later in this document (*see*, e.g., page 12). This guidance (including the legal and technical documents) supporting the EPA's recommended SIL values may be viewed as a model for permitting authorities that seek to develop alternative SIL values. Permitting authorities may elect to utilize alternative "confidence intervals" as well as regional or local factors in developing their own SIL values.[11]

Since the 2010 rulemaking, the EPA has examined the legal basis for using SIL values in PSD air quality impact analyses. In addition, the EPA has sought to develop a stronger analytical foundation for the EPA recommended SIL values. This guidance and supporting documents are the products of this effort. They identify specific SIL values for ozone and $PM_{2.5}$ and provide a supporting justification that permitting authorities may choose to apply on a case-by-case basis. The values and supporting justification are designed so that permitting authorities can choose to apply the SIL values to demonstrate that a proposed source does not cause or contribute to a violation of NAAQS or PSD increments. In contrast to the 2010 rulemaking, we have developed separate SIL values for the $PM_{2.5}$ NAAQS and PSD increments, and we have developed SILs for the ozone NAAQS. Since there are no PSD increments for ozone, the EPA has not developed SILs for ozone.

The EPA believes that the application of these SILs in the manner described below would be sufficient in most situations for a permitting authority to conclude that a proposed source will not cause or contribute to a violation of an ozone or $PM_{2.5}$ NAAQS or $PM_{2.5}$ PSD increments. However, this guidance is not a final agency action and does not reflect a final determination by the EPA that any particular proposed source with a projected impact below the recommended SIL value does not cause or contribute to a violation. A determination that a proposed source does not cause or contribute to a violation can only be made by a permitting authority on a permit-specific basis after consideration of the permit record. This guidance is not legally binding and does not affect the rights or obligations of permit applicants, permitting authorities, or others. The SIL

[10] *Rocky Mountain Steel Order* at 16-18, supra footnote 5. Such a justification may incorporate the information compiled by the EPA to support the SILs recommended in this memorandum.

[11] A description of the "confidence interval" is provided at page 12 of this document and in the technical document at section 2.2 (Statistical Methods and Assessing Significance Using Confidence Intervals).

values identified by the EPA have no practical effect unless and until permitting authorities decide to use those values in particular permitting actions. The experience of permitting authorities using these SILs on a case-by-case basis, or in choosing to limit or forego their use in specific situations, will be valuable information for the EPA to consider in a future rulemaking. Permitting authorities retain the discretion to apply and justify different approaches and to require additional information from the permit applicant to make the required air quality impact demonstration, consistent with the relevant PSD permitting requirements.

II. BACKGROUND

A PSD permit applicant must demonstrate that "emissions from construction or operation of such facility will not cause, or contribute to, air pollution in excess of any" NAAQS or PSD increment.[12] The EPA has reflected this requirement in its PSD regulations.[13] The Clean Air Act (Act) does not specify how a permit applicant or permitting authority is to make this demonstration, but section 165(e) authorizes the EPA to determine how the analysis is to be conducted, including the use of air quality models. In accordance with this authority, the EPA has promulgated regulations that identify such models and the conditions under which they may be used in the PSD program to make the demonstration required under the Act.[14]

Using the models identified in the EPA's regulations, there are two basic ways that a PSD permit applicant can demonstrate that the proposed source's emissions will not cause or contribute to a violation of a NAAQS or PSD increment. One way is to demonstrate that no such violation is occurring or projected to occur in the area affected by the emissions from the proposed source.[15] A second way is to demonstrate that the emissions from the proposed source do not cause or contribute to any identified violation of the NAAQS or PSD increments.[16]

The Act does not define "cause" or "contribute." Reading these terms in context, the EPA has historically interpreted this provision in section 165(a)(3) of the Act and associated regulations to mean that a source must have a "significant impact" on ambient air quality in order to cause or contribute to a violation.[17] Thus, the EPA and other permitting authorities have concluded that a

[12] 42 U.S.C. 7475(a)(3) (section 165(a)(3) of the Act). The EPA interprets the phrase "in excess of" to mean a violation, not the exceedance described in 40 CFR 50.1(l).
[13] 40 CFR 51.166(k); 40 CFR 52.21(k).
[14] The PSD regulations at 40 CFR 51.166(l) and 52.21(l) require the use of "applicable models, data bases, and other requirements" specified in 40 CFR part 51, Appendix W, also known as the *Guideline on Air Quality Models (Guideline*).
[15] 1990 Draft New Source Review (NSR) Workshop Manual at C.51.
[16] 40 CFR part 51, App. W, § 9.2.3; 1990 Draft NSR Workshop Manual at C.52.
[17] *In re: Prairie State Generating Co*., 13 E.A.D. 1, 105 (EAB 2006). This EAB opinion includes a long discussion of the EPA's prior guidance with other examples.

proposed source may meet the requirements in section 165(a)(3) and the EPA's PSD regulations by showing that its projected impact on air quality at the site of a modeled violation is below a level of air quality impact considered to be significant.[18]

Historic Use of SILs

In the context of section 165(a)(3), the EPA has historically used pollutant-specific concentration levels known as "significant impact levels" to identify the degree of air quality impact that "causes, or contributes to" a violation of a NAAQS or PSD increment.[19] Consistent with the EPA guidance, proposed sources have met the requirement to demonstrate that they do not cause or contribute to a violation by showing that the ambient air quality impacts resulting from the proposed source's emissions would be below these concentration levels.[20] The SIL values have served as a compliance demonstration tool to make the required demonstration in the PSD program. They have helped to reduce the burden on permitting authorities and permit applicants to conduct often time-consuming and resource-intensive air dispersion modeling where such modeling was unnecessary to demonstrate that a permit applicant meets the requirements of section 165(a)(3), consistent with the procedures set forth originally in 1977 in the "Guidelines for Air Quality Maintenance Planning and Analysis, Volume 10 (Revised) and Procedures for Evaluating Air Quality Impact of New Stationary Sources."[21]

Recent Status of SILs for Ozone and $PM_{2.5}$

Since the inception of the PSD program, the EPA has faced technical challenges with providing compliance demonstration tools for those pollutants that are not directly emitted by sources (ozone and secondarily-formed $PM_{2.5}$) and which form through chemical reactions of precursor pollutants. In July 2010, the Sierra Club petitioned the EPA to initiate rulemaking regarding the establishment of air quality models for ozone and $PM_{2.5}$ for use by PSD permit applicants. In January 2012, the EPA granted the petition and committed to engage in rulemaking to evaluate whether updates to the *Guideline* are warranted and, as appropriate, incorporate new analytical techniques or models for ozone and secondarily-formed $PM_{2.5}$. In granting the petition, the EPA explained that the "complex chemistry of ozone and secondary formation of $PM_{2.5}$ are well-documented and have historically presented significant challenges to the designation of particular models for assessing

[18] 1990 Draft NSR Workshop Manual at C.52.
[19] 61 FR 38250, 38293 (July 23, 1996); 72 FR 54112, 54139 (September 21, 2007).
[20] 1990 Draft NSR Workshop Manual at C.51-C.52.
[21] October 1977, U.S. EPA, Office of Air Quality Planning and Standards, Research Triangle Park, NC 27711. The 1977 document did not discuss SILs, but did identify procedures for air quality analyses pursuant to the PSD program.

the impacts of individual stationary sources on the formation of these air pollutants"[22] Because of these considerations, the EPA's past judgment had been that it was not technically sound to designate with particularity specific models that must be used to assess the impacts of a single source on ozone and secondarily-formed $PM_{2.5}$ concentrations. Instead, the EPA established a consultation process with permitting authorities for determining (on a permit-specific basis) the analytical techniques that should be used for single-source analyses for both ozone and secondarily-formed $PM_{2.5}$.

The EPA has responded to the Sierra Club petition by finalizing revisions to the EPA's *Guideline*.[23] As discussed in the preamble to the *Guideline*, recent technical advances have made it reasonable for the EPA to provide more specific guidelines that identify appropriate analytical techniques or models that may be used in compliance demonstrations for the ozone and $PM_{2.5}$ NAAQS and $PM_{2.5}$ PSD increments. The revisions to the *Guideline* include criteria and process steps for choosing single-source analytical techniques or models to estimate ozone impacts from precursor nitrogen oxide (NOx) and volatile organic compound (VOC) emissions and to assess concentrations of direct and secondarily-formed $PM_{2.5}$. The ozone and $PM_{2.5}$ SIL values recommended in this guidance are intended to complement the *Guideline* updates by providing thresholds that may be used to determine whether an increase in air pollutant concentration (impact) predicted by the chosen technique or model causes or contributes to a violation.

In the 2010 rulemaking, the EPA established SIL values for $PM_{2.5}$ in paragraph (k)(2) of the PSD regulations at 40 CFR 51.166 and 52.21. In January 2013, the U.S. Court of Appeals for the District of Columbia Circuit granted the EPA's request to vacate and remand the paragraph (k)(2) provision in both PSD regulations so the EPA could correct them.[24] Paragraph (k)(2) as promulgated in 2010 included numerical values of $PM_{2.5}$ SILs and statements about their role in completing an air quality impact analysis with regard to the $PM_{2.5}$ NAAQS and PSD increments. Specifically, the 52.21(k)(2) rule text stated that if the impact of a proposed source seeking a federal PSD permit was below the relevant SIL value(s), then the proposed source would be deemed to not cause or contribute to a violation. The 51.166(k)(2) rule text stated that a state's PSD rules could contain a similar provision. The EPA asked the court to vacate and remand the (k)(2) paragraphs of both PSD regulations so that the EPA could correct an inconsistency between (1) that rule text, which left no discretion for the permitting authority, and (2) our statements in the preamble to the 2010 rulemaking, which identified certain circumstances where it may not be

[22] Letter from Gina McCarthy, Assistant Administrator, EPA Office of Air and Radiation, to Robert Ukeiley, Sierra Club, January 4, 2012.
[23] 82 FR 5182 (January 17, 2017).
[24] *Sierra Club v. EPA*, 705 F.3d 458, 466 (D.C. Cir. 2013).

appropriate for a permitting authority to rely solely on the $PM_{2.5}$ SILs as a basis for concluding that a proposed source does not cause or contribute to a violation.[25]

The court left intact the $PM_{2.5}$ NAAQS significance levels separately promulgated at 40 CFR 51.165(b)(2), because the regulatory text in that section did not say that a proposed source that has an impact less than the significance level is always deemed to not cause or contribute to a violation. The regulatory text at 40 CFR 51.165(b)(2) says that a major source or major modification with a projected impact greater than the listed significance level at any location that does not or would not meet the applicable NAAQS will be considered to cause or contribute to a violation, but this provision does not compel the opposite conclusion for projected impacts equal to or below that level.[26]

III. RECOMMENDED SIL VALUES FOR USE IN AIR QUALITY IMPACT DEMONSTRATION REQUIRED TO OBTAIN A PSD PERMIT

As discussed above, the EPA has interpreted the phrase "cause, or contribute to" in section 165(a)(3) of the Act to mean that a proposed source will have a "significant impact" on air pollutant concentrations that violate the standards. In this context, the EPA believes permitting authorities may read the phrase "cause, or contribute to" in section 165(a)(3) to be inapplicable to an air quality impact that is insignificant. This interpretation is more fully explained in the legal memorandum. In the context of this section of the Act, the EPA believes an insignificant impact is an impact on air quality concentrations that is small and not meaningful (e.g., the EPA has often described such an impact as "trivial" or "*de minimis*").

As discussed in more detail in the legal memorandum, a permitting authority may conclude that a PSD permit applicant will "cause" a modeled violation of a NAAQS when the increased emissions from construction or modification of the proposed source are the reason for, responsible for, or the "but for" cause of the violation. However, a permitting authority must also consider whether emissions "contribute" to a violation in circumstances where a violation of the NAAQS is present before considering the proposed increase in emissions from a PSD construction project, or when

[25] These preamble statements were the following: "[N]otwithstanding the existence of a SIL, permitting authorities should determine when it may be appropriate to conclude that even a *de minimis* impact will 'cause or contribute to' an air quality problem and to seek remedial action from the proposed new source or modification." *See* 75 FR 64864, 64892. "[T]he use of a SIL may not be appropriate when a substantial portion of any NAAQS or increment is known to be consumed." *See* 75 FR 64864, 64894. "[W]e earlier provided an example of when it might be appropriate to require a modified source to mitigate its contribution to a violation of a NAAQS or increment even when the predicted ambient impact of the proposed emissions increase would result in what is normally considered to be *de minimis*." *See* 75 FR 64864, 64894.

[26] 40 CFR 51.165(b)(2) is phrased such that an impact equal to the listed value is treated the same as impacts below the listed value. This contrasts to the approach in former 40 CFR 51.166(k)(2) and 52.21(k)(2), and, in this guidance, that an impact equal to the SIL is treated the same as impacts above the SIL.

emissions from multiple sources may impact a particular area. In the absence of specific language in section 165(a)(3) regarding the degree of contribution that is required (such as the term "significantly"), a permitting authority has the discretion under this provision to exercise its judgment to determine the degree of impact that contributes to adverse air quality conditions based on the particular context in which the term contribute is used. A permitting authority may also identify criteria or factors that may be used to determine whether something contributes, including qualitative or quantitative criteria that are appropriate to the particular context.[27]

For purposes of implementing section 165(a)(3) of the Act, the EPA has found it more expedient and practical to use a quantitative threshold (expressed as a level of change in air quality concentration) to determine whether increased emissions from proposed construction or modification of a source will cause or contribute to air quality concentrations in violation of applicable standards. One of the goals of the development of SILs as a compliance demonstration tool is to ensure an appropriate balance between maintenance of air quality and PSD permit process streamlining. The EPA believes that the permitting process can be streamlined without compromising air quality if the EPA and permitting authorities are able to identify a quantitative threshold or dividing line between an insignificant and a significant impact on air pollutant concentrations. Using a quantitative threshold for this purpose is permissible as long as the EPA or the appropriate permitting authority provides a reasoned explanation for why impacts below that value do not cause or contribute to a violation in a particular context.

Historical Approach for Developing SILs

To determine what is (and is not) a significant impact in the context of section 165(a)(3) of the Act, the EPA has previously supported using the levels in 40 CFR 51.165(b)(2).[28] The EPA has

[27] *See Catawba County, N.C. v. EPA*, 571 F.3d 20, 39 (D.C. Cir. 2009). In this case interpreting the term "contributes" in section 107(d) of the Act, the court held that the EPA is not required to establish a quantitative or objective, bright-line test to define a contribution by sources to adverse air quality conditions in a nearby area in the context of designations with respect to attainment of a NAAQS. The court recognized that the EPA has the discretion to use a totality-of-the-circumstances test if the Agency defines and explains the criteria that it is applying. While this opinion said that a quantified threshold is not required to define "contribution" in the context of section 107(d), the court's reasoning does not preclude PSD permitting authorities from choosing to use a quantitative level of impact to represent a contribution to a violation of the NAAQS or PSD increment when implementing section 165(a)(3) of the Act.

[28] The Emison Memo, *supra* footnote 5, references 40 CFR 51.165(b)(2) for the purpose of defining "significant" in this context. The NSR Workshop Manual at C.26-C.28 lists values from 40 CFR 51.165(b)(2) for the purpose of defining the area of "significant ambient impact."

described these levels as "significance levels."[29] 40 CFR 51.165(b)(2) was originally promulgated by the EPA in 1987 as part of an offset provision permitting authorities could apply after it was determined that construction at a stationary source was predicted to cause or contribute to a violation of the NAAQS.[30] This regulation provides that a proposed source planning to locate in an attainment area will be considered to "cause or contribute to" a violation of the NAAQS if its impact would exceed specific values identified in the regulation. For example, 40 CFR 51.165(b)(2) states that a proposed source impact that is greater than 5 micrograms per cubic meter ($\mu g/m^3$) for the 24-hour sulfur dioxide (SO_2) NAAQS causes or contributes to a violation of that NAAQS. The section refers to these values as "significance levels." Values are not provided for every NAAQS, particularly ozone (and not for $PM_{2.5}$ until the 2010 rulemaking), but for those NAAQS covered in this regulation, the application is the same. Over time, these air quality concentration significance levels in 40 CFR 51.165(b)(2) have become known as "significant *impact* levels"[31] [emphasis added] in order to distinguish them from the significant *emissions rates* reflected in the definition of the term "significant," which serve a different function in the PSD program.[32] The EPA has also issued guidance memoranda that have provided recommended SIL values for the 1-hour nitrogen dioxide (NO_2) and SO_2 NAAQS, to be used for the purpose of determining what are (and are not) significant impacts for these pollutants in the context of the 1-hour standards.[33]

As referenced above, the EPA's values contained in 40 CFR 51.165(b)(2) originally were related to the level of protection afforded by the PSD increments that Congress established for Class I areas.[34] The EPA generally relied on that approach in 2010 by using the ratio of the $PM_{2.5}$ NAAQS

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[29] The EPA initially promulgated these same concentration values in 1978 and described them as the "minimum amount of ambient impact that is significant." 43 FR 26380, 26398 (June 19, 1978). In the 1979 Emissions Offset Interpretative Ruling (Appendix S to 40 CFR part 51), the EPA used these values as the "significance levels" under which a source locating in the "clean" portion of a nonattainment area may be exempt from the preconstruction review requirements. 44 FR 3274, 3283 (January 16, 1979). Under Appendix S, as revised in 1980, the EPA considered a source to "cause or contribute to" a violation if the impact of the source or modification would exceed these significance levels at any locality that does not meet the NAAQS. 45 FR 31307, 31311 (May 13, 1980).

[30] 52 FR 24672, 24713 (July 1, 1987).

[31] The first reference to "significant impact levels" is in the 1980 NSR Workshop Manual, which the EPA subsequently updated in the 1990 draft. It is worth noting that the 1977 comments to the proposed Appendix W rule (45 FR 58543) addressed whether a single-source screening technique should be used to determine if a cumulative modeling analysis would be required in a preconstruction review; industry and state agency comments indicated both groups favored some use of a tool to alleviate resource burden.

[32] 40 CFR 52.21(b)(23) defines the term "significant" and applies discrete values for determining if the emissions increase from a proposed source will be significant. This regulation states that an increase in emissions of each ozone precursor (VOC and NOx) is significant if it equals or exceeds 40 tons per year (tpy) and, for direct emissions of $PM_{2.5}$ the significance level is 10 tpy. For $PM_{2.5}$ precursor emissions, the significance level is 40 tpy for SO_2 and 40 tpy for NOx.

[33] Page memoranda, *supra* footnotes 1 and 2 of this attachment.

[34] 43 FR 26380, 26398.

to the particulate matter 10 micrometers or less in diameter (PM_{10}) NAAQS as a multiplier to add $PM_{2.5}$ values to 40 CFR 51.165(b)(2) and to establish $PM_{2.5}$ SIL values in 40 CFR 51.166(k)(2) and 52.21(k)(2).[35] However, given limitations in the rationale supporting them, the EPA recognized in the preamble to the 2010 rulemaking that a permitting authority may not be able to apply the SIL values derived through this approach in every situation to show that proposed construction does not cause or contribute to a violation of standards. The EPA acknowledged that "the use of a SIL may not be appropriate when a substantial portion of any NAAQS or increment is known to be consumed." The EPA also said that "notwithstanding the existence of a SIL, permitting authorities should determine when it may be appropriate to conclude that even a *de minimis* impact will 'cause or contribute to' an air quality problem and to seek remedial action from the proposed new source or modification."[36] To guard against the improper use of the 2010 SILs for $PM_{2.5}$ in such circumstances, the EPA later recommended that permitting authorities use those SILs only where they could establish that the difference between background concentrations in a particular area and the NAAQS was greater than those SIL values.[37] This approach was intended to guard against misuse of the SILs in situations where the existing air quality was already close to the NAAQS.

Analytical Foundation for Recommended SILs

Since the May 2014 $PM_{2.5}$ modeling guidance was issued, the EPA has conducted a statistical analysis that provides an improved analytical foundation for the EPA's selection, based on the policy considerations described below, of a degree of change in concentration that permitting authorities may use to represent an insignificant impact on air pollutant concentrations for ozone and $PM_{2.5}$ in the context of PSD permitting. This technical method, referred to as the air quality variability approach, is described in the technical document. Given the improvements reflected in this method, the EPA does not see a need for permitting authorities to show that the difference between background concentrations and the relevant NAAQS is greater than the SIL value before applying one of the recommended $PM_{2.5}$ SIL values. The EPA's intention with this new method was to derive SIL values that are more universally applicable to a range of conditions, including those where a substantial portion of the NAAQS or PSD increment is known to be consumed. However, permitting authorities retain discretion whether to apply SILs as a general matter, or in particular permitting actions, based on information in the permit record.

In order for a specific change in air quality concentrations to be used to show that a proposed source does not cause or contribute to a violation of the NAAQS, the concentration change must

[35] 75 FR 64890.
[36] 75 FR 64864, 64892.
[37] Memorandum from Stephen D. Page, EPA OAQPS, to EPA Regional Air Division Directors, "Guidance for $PM_{2.5}$ Permit Modeling," May 20, 2014.

represent a level of impact on ambient air quality that is not significant or meaningful. The EPA's judgment is that values representing such a level can be selected from a statistical analysis of the variability of air quality, using data from the U.S. ambient monitoring network for ozone and $PM_{2.5}$. Due to fluctuating meteorological conditions and changes in day-to-day operations of all air pollution sources in an area, there is an inherent variability in the air quality in the area surrounding a monitoring site. This variability can be characterized through the application of a well-established statistical framework for quantifying uncertainty.[38,39] The analysis described in the technical document quantifies the inherent variability in pollutant concentrations (as measured by design values) and informs the EPA's choice of a value for a change in concentrations that the EPA does not consider significant or meaningful because changes of this magnitude are well within the inherent variability of observed design values.[40] Once the precautionary choices described below are built into the calculation, this degree of change in concentration is, thus, indistinguishable from the inherent variability in the measured atmosphere and may be observed even in the absence of the increased emissions from a new or modified source. Therefore, a permitting authority can reasonably conclude that emissions of a proposed source that have a projected impact below the SIL values provided in this memorandum are not the reason for, responsible for, or the "but for" cause of a NAAQS violation. Likewise, this indicates that changes in air quality within this range are not meaningful, and, thus, do not contribute to a violation of the NAAQS.

Before delving in detail into the technical and policy considerations that inform the EPA's choice of the SILs recommended in this document, it is important to point out that the discretion of the EPA and other permitting authorities is limited by the 2010 rulemaking. Specifically, since the EPA has established by regulation that a $PM_{2.5}$ impact greater than a certain value will be considered to cause or contribute to a violation of the relevant NAAQS, permitting authorities may not use a value higher than 1.2 $\mu g/m^3$ for the 24-hour $PM_{2.5}$ NAAQS or a value higher than 0.3 $\mu g/m^3$ for the annual $PM_{2.5}$ NAAQS. Because ozone is not addressed in 40 CFR 51.165(b)(2), permitting authorities are not precluded from developing a higher ozone NAAQS SIL value than recommended in this guidance. Likewise, 40 CFR 51.165(b)(2) does not address PSD increments and, thus, does not constrain the discretion of a permitting authority to develop a higher SIL value and use it for PSD increment purposes.

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[38] Efron, B. (1979); "Bootstrap methods: Another look at the jackknife". The Annals of Statistics 7 (1): 1–26. doi:10.1214/aos/1176344552.

[39] Efron, B. (2003); Second Thoughts on the Bootstrap. Stat. Sci., 18, 135-140.

[40] The EPA conducted an external peer review of the technical document containing the statistical analysis used for developing the SILs for ozone and $PM_{2.5}$. The peer review comments were supportive of the air quality variability method as being appropriate for application for SILs. The comments also suggested several considerations for improvements to the technical document and analyses to better support the application of the analysis to determine specific SIL values. Therefore, the EPA made a number of revisions to the technical document, including conducting new analyses to investigate issues raised by the reviewers, edits to a number of sections for clarity and accuracy, and updating the analysis to include the most recent data. A peer review report that outlines the subsequent changes to the technical analysis is available from the U.S. EPA library, library number EPA 454/S-18-001.

Basis for Development of Recommended SILs for Ozone and $PM_{2.5}$

In developing the recommended SILs for ozone and $PM_{2.5}$, we assessed the variability in pollutant concentrations, as determined by the national monitoring network, from the design value at each monitor (i.e., baseline value). The technical analysis uses traditional statistical techniques based on statistical significance testing to characterize the variability in air quality. The conceptual underpinnings of the analysis are an application of the concept of "statistical significance" to inform a policy decision regarding what represents an insignificant impact and, therefore, may serve as the basis for developing a SIL for use in the air quality impact analyses required for PSD permitting. More specifically, traditional statistics is based on the concept of identifying what constitutes a statistically significant change from a baseline value where the "baseline" is the statistic of interest, such as the mean or, in this case, the design value. Rather than focusing on statistically significant changes, the purpose of the analysis was to calculate changes in the design values that, once precautionary choices are applied, may be considered not significant or meaningful. To identify recommended SILs for the desired application in the PSD program, the EPA determined that the findings of the statistical analysis can be used to identify a change in the design value (i.e., an air quality impact) below which a permitting authority may reasonably conclude that the impact does not cause or contribute to a violation of a NAAQS. The principles of statistical significance testing do not by themselves provide a single, unique threshold for determining the statistical significance of a change in the design value. Statistical significance testing provides a range of concentration values that can be considered to represent a statistically significant change in air quality or, in this application, a change in air quality that is not statistically significant. Therefore, it is necessary to consider the function and application of SIL values in the context of the PSD program and to select a change in air quality that is reasonably representative of the showing that a proposed source will not cause or contribute to a NAAQS violation, as required by the Act and PSD regulations.

In making a recommendation for an appropriate SIL value, the EPA balanced two considerations: 1) the usefulness of the SIL as a compliance demonstration tool in the PSD permitting program, and 2) the likelihood of a SIL value representing an impact that is not significant. In balancing these considerations, the EPA made policy decisions concerning the confidence interval (CI) to represent the inherent variability for purposes of the NAAQS compliance demonstration, the approach used to scale local variability to the level of the NAAQS, the geographic extent of each summary value, and the design value year or years from which to use the variability results. As described below, for each of these factors, the EPA chose options that are precautionary, leading to SILs designed to ensure the protection of air quality.

Through the statistical analysis, we calculated CIs, which represent different assessments of the level of change in air quality based on the inherent variability in the air quality of an area. We then selected the recommended SIL values as a function of the CIs, the baseline value, and policy considerations. The selection of a CI in defining a particular SIL value required an exercise of judgment based on the technical and policy considerations (as described below) such that the selected value represents a level of change in air quality concentration that can be considered not significant or meaningful in the context of evaluating the impact of emissions from a proposed

source. These policy considerations work in conjunction with the statistical analysis, to provide a rational basis to select values derived from the statistical analysis that can be applied as a tool for making the PSD compliance demonstration required by the Act and PSD regulations. For more information on the design and results of the technical analysis, please refer to the technical document.

The technical analysis relies upon data from the national ambient monitoring network for ozone and $PM_{2.5}$. Because these data generally are the basis for determining NAAQS attainment, they are an appropriate basis to characterize air quality, with the statistical analysis evaluating the variation in the design value at each monitoring site across the nation. This variability in air quality concentrations is described by the different CIs computed from the statistical analysis. The CIs identify a statistically significant deviation from the baseline value. As described in the technical document (Section 3.0), the EPA has calculated CIs at the 25 percent, 50 percent, 68 percent, 75 percent, and 95 percent intervals for consideration in defining SIL values for ozone and $PM_{2.5}$. The smallest CI that might be used to identify a statistically significant change would be a 68 percent CI, which corresponds to one standard deviation from the baseline value. Thus, any change in the design value larger than the variation represented by the 68 percent CI could be considered to be a statistically significant change. However, for purposes of the PSD program, we are seeking to identify a concentration value that constitutes an insignificant impact, meaning a change in the design value that does not reflect a meaningful difference in air quality based on the introduction of a new source. Thus, from a statistical perspective, the EPA believes that the CIs used in determining an appropriate SIL value should be below 68 percent, corresponding to a change of less than one standard deviation.

Very small SIL values would have limited use to permitting authorities (i.e., would lead to "false positives"), while larger values (closer to the air quality change represented by the 68 percent CI) would lead to "false negatives." In weighing these competing considerations to select an appropriate SIL value, the EPA believes that air quality change represented by a 50 percent CI represents a protective approach for a SIL value because it is sufficiently within the 68 percent CI, while still being sufficiently higher than zero such that it can be a useful compliance demonstration tool for the PSD permitting process. Of the available choices, the 50 percent CI has more utility as a screening tool under the permitting program, while providing a value that adequately reflects a change in air quality concentrations that is not significant or meaningful.

The EPA chose to use the relative variability rather than the absolute variability in calculating the SILs because the technical analysis (Section 4.0) showed that the relative variability is fairly consistent across the range of design values, suggesting a commonality in the relative variability across a wide range of geographic regions, chemical regimes, and baseline air quality levels in the development of the SILs.

In order to promote national consistency, the EPA has historically provided national SIL values rather than regional or local values. The EPA considered whether a SIL value should be informed by the statistical analysis at the particular site of the proposed source or the central tendency across all monitored sites in the U.S., regardless of the proposed source's planned location. The EPA

continues to recommend using a national SIL value based on the variability aggregated across the nation rather than developing regional or local values. Findings from the statistical analysis indicate that while there are local spatial correlations, there are few instances of large scale (e.g., region-to-region) trends in ambient air variability. Thus, national numbers are supported by the spatial analysis and suitable for use here. Because NAAQS and PSD increments are set on a national basis, the EPA and permitting authorities have historically used national SILs in the PSD program. National SIL values are designed to be used for any location subject to PSD requirements and eliminate the need to determine local or regional approaches for developing a SIL value, including addressing the status of local air quality monitoring (which would be needed if regional or local SILs were to be determined). However, as noted above, local permitting authorities have the discretion to develop alternate SILs.[41] Having a national SIL value promotes consistency in implementation and prevents possible confusion or arbitrary choices that may arise with highly localized SIL values (i.e., determining which monitors to use for computations and other possible deviations from national protocol). Given these considerations, the EPA recommends continuing the practice of using national SIL values. Furthermore, as shown in the technical analysis (Section 4.0), because the median statistic is less influenced by high variability areas, the median statistic is preferred for use in selecting a SIL. Therefore, using the median statistic of the relative variability from the 50 percent CIs from the entire U.S. ambient monitoring network satisfies the policy needs for a SIL and is congruent with the physical and chemical processes that result in this variability.

Next, the EPA chose to use the most recently available years of ambient monitoring data (2012-2016) in the technical analysis to derive the recommended SILs. The SILs should reflect the most recent and representative state of the nation's atmosphere. In assessing the historical trends in ozone and $PM_{2.5}$ air quality levels across the nation, there are observable downward trends in concentrations that indicate more recent data are most appropriate. To have more confidence that the resulting values would not be unduly influenced by temporary circumstances or episodic events, the EPA's recommended SILs are based on an average of the most recent three design value years as a basis for ozone and $PM_{2.5}$ SIL development (i.e., 2012-2014, 2013-2015, 2014-2016).

[41] In the cases where a permitting authority is considering an alternative SIL(s) due to the characteristics of regional variability (e.g., if, based on the analysis presented in the technical document, a specific area appears to have more localized variability than the national average), it is important to understand the factors driving that apparent variability to fully support the application of alternative SIL(s). For example, the results presented in section 4.3 of the technical document show some areas with regional variability for the 24-hour $PM_{2.5}$ standard, though no regional trends were apparent for the annual $PM_{2.5}$ standard and the ozone standard. Furthermore, these regional trends for the 24-hour $PM_{2.5}$ standard were not apparent in the other data years shown in the appendix of the technical document. Additionally, the discussion in the technical document highlights potential causes for some of the variability in these regions (e.g., lower sampling frequency, that can lead to apparently higher variability than would otherwise be shown with higher sampling frequency). Similar issues are discussed in the technical document and can have important consequences for the results and conclusions drawn from more localized analyses of the ambient data and should be thoroughly vetted when considering alternative SILs.

SILs for NAAQS

Using the method described above, the EPA developed SIL values for the 8-hour ozone NAAQS and the annual and 24-hour $PM_{2.5}$ NAAQS. Table 1 lists these SIL values for the NAAQS. Each of these SIL values is based on the level, averaging period and statistical form of its corresponding NAAQS. For the reasons discussed in this guidance and supporting documents, we recommend that PSD permitting authorities use the following values as SILs on a case-by-case basis in the manner described in the next section.

Table 1. Recommended SIL Values for Ozone and $PM_{2.5}$ NAAQS

Criteria Pollutant (NAAQS level)	NAAQS SIL concentration
Ozone 8-hour (70 ppb)	1.0 ppb
$PM_{2.5}$ 24-hour (35 $\mu g/m^3$)	1.2 $\mu g/m^3$*
$PM_{2.5}$ annual (12 $\mu g/m^3$ or 15 $\mu g/m^3$)	0.2 $\mu g/m^3$

* The table accounts for the significance level for the 24-hour $PM_{2.5}$ NAAQS in 40 CFR 51.165(b)(2). Refer to the guidance discussion for details.

For the 8-hour ozone NAAQS, the SIL value we recommend is 1.0 part per billion (ppb). Consistent with the form of the NAAQS, this value is based on the annual 4th highest daily maximum 8-hour concentration, averaged over 3 years. The recommended SIL value for ozone is the same as the derived value from the air quality variability analysis.

For the 24-hour $PM_{2.5}$ NAAQS, the SIL value we recommend is 1.2 $\mu g/m^3$. The derived value from the air quality variability analysis is 1.5 $\mu g/m^3$ and is based on an analysis of the 98th percentile 24-hour concentrations averaged over 3 years. However, 40 CFR 51.165(b)(2) still lists 1.2 $\mu g/m^3$ as the significance level for the 24-hour $PM_{2.5}$ NAAQS. In the 2010 rulemaking, the EPA determined that an impact above this value will be considered to cause or contribute to a violation of the 24-hour $PM_{2.5}$ NAAQS at any location that does not meet this standard. In the same rule, the EPA also sought to establish that an impact below this value would not cause or contribute to a violation of this NAAQS but acknowledged that there could be circumstances where this conclusion was not always valid. Even though the ambient air quality variability approach indicates that an impact below 1.5 $\mu g/m^3$ is not significant, significance levels for $PM_{2.5}$ remain in the EPA's regulations at 40 CFR 51.165(b)(2) and the EPA is presently bound by its prior conclusion (that an impact above 1.2 $\mu g/m^3$ is significant and will cause or contribute to a violation of the 24-hour $PM_{2.5}$ NAAQS). Thus, the EPA cannot conclude at this time that an impact between 1.2 $\mu g/m^3$ and 1.5 $\mu g/m^3$ is an insignificant impact or an impact that will not cause or contribute to a violation of the NAAQS. However, based on the ambient air quality variability

approach, the EPA can conclude that impacts below 1.2 $\mu g/m^3$ are insignificant at any location and will not cause or contribute to a violation of the NAAQS.[42]

For the annual $PM_{2.5}$ NAAQS, we recommend 0.2 $\mu g/m^3$ as the SIL value, which is the value based on a 3-year average of annual average concentrations. This value is lower than the value of 0.3 $\mu g/m^3$ listed in 40 CFR 51.165(b)(2). Since 40 CFR 51.165(b)(2) does not address whether an impact below 0.3 $\mu g/m^3$ causes or contributes to a violation of the NAAQS, the EPA and other permitting authorities retain the discretion under this provision to determine on a case-by-case basis whether an impact between 0.2 $\mu g/m^3$ and 0.3 $\mu g/m^3$ will cause or contribute to a violation of the annual $PM_{2.5}$ NAAQS. However, based on the ambient air quality variability approach, the EPA's judgment is that an impact below 0.2 $\mu g/m^3$ is not significant and should be considered to not cause or contribute to any violation of the annual $PM_{2.5}$ NAAQS that is identified.

We recommend that these SIL values apply to the NAAQS everywhere, regardless of the class of the airshed.[43] For $PM_{2.5}$, this recommendation is different than what was provided in the vacated (k)(2) paragraphs, where the SIL value that would be used for NAAQS purposes was different for Class I areas than for Class II and III areas. The EPA recognizes that, historically, Congress has provided special protections to Class I areas, as described below in the discussion of SILs for PSD increments. The EPA believes that because each ozone and $PM_{2.5}$ NAAQS is uniform throughout the class areas, no class-specific protection via SILs is necessary when assessing whether a source causes or contributes to a violation of the NAAQS.

SILs for PSD Increments

There are no PSD increments established for ozone and, thus, no ozone SIL values are needed for PSD increment compliance purposes. We used the air quality variability approach to develop PSD increment SILs for the $PM_{2.5}$ PSD increments (*see* Table 2), but in an indirect way. The SIL values

[42] 40 CFR 51.165(b)(2) provides that a source impact higher than one of the listed significance levels is to be considered significant. A source impact exactly equal to a significance level need not be considered significant. In contrast, in this guidance, consistent with past guidance, we are recommending that a value exactly equal to a recommended SIL be considered significant. Thus, these two approaches treat a value equal to the stated level differently. In practice, we do not expect this to be a practical difference because it will be very unusual for a source's impact to exactly equal one of the recommended SIL values.

[43] When Congress established the PSD program requirements under the 1977 Act Amendments, it included specific numerical PSD increment levels for SO_2 and particulate matter (expressed at that time as "total suspended particulate") for Class I, II and III areas. Congress designated Class I areas (including certain national parks and wilderness areas) as areas of special national concern, where the need to prevent deterioration of air quality is the greatest. Consequently, the PSD increments are the smallest in Class I areas. The PSD increments of Class II areas are larger than those of Class I areas and allow for a moderate degree of emissions growth. Class III areas have the largest PSD increments, but to date no Class III areas have been designated. The EPA subsequently defined Class I, II and III PSD increments for NO_2 and PM_{10}, and $PM_{2.5}$ in multiple rulemakings.

for the $PM_{2.5}$ PSD increments are derived from the recommended NAAQS SIL values and reflect that, under the PSD regulations, the allowable PSD increment values are different for Class I, II and III areas. For Class II areas (which comprise most of the U.S.) and Class III areas (of which there are currently none), we recommend that the values of the NAAQS SILs also be used for PSD increment SILs. For Class I areas, we are recommending annual and 24-hour PSD increment SIL values that are lower than the NAAQS SIL values. This is because the EPA recognizes that Congress intended to establish special protection for Class I areas, as observed by the more stringent statutory Class I PSD increments, as well as provisions for use of air quality related values (including protection against visibility impairment).[44] To help reflect this additional protection, we applied the ratios of the Class I and Class II allowable PSD increments to the NAAQS SIL values derived in our technical analysis.[45] The EPA believes these values for Class I areas will continue to reflect this higher level of protection through the PSD increment SILs.

Table 2. Recommended SIL Values for $PM_{2.5}$ PSD Increments

Criteria Pollutant (averaging period)	PSD increment SIL concentration		
	Class I	Class II	Class III
$PM_{2.5}$ (24-hour)	0.27 μg/m^3	1.2 μg/m^3	1.2 μg/m^3
$PM_{2.5}$ (annual)	0.05 μg/m^3	0.2 μg/m^3	0.2 μg/m^3

IV. APPLICATION OF SILS

The EPA recommends that permitting authorities consider using these SIL values for ozone and $PM_{2.5}$ on a case-by-case basis at the same points in the PSD air quality analysis as SIL values historically have been used in the PSD program, as described below, with one exception regarding defining the spatial extent for modeling.

First, permitting authorities may elect to use the SIL values reflected in this guidance in a preliminary (single-source) analysis that considers only the impact of the proposed source in the permit application on air quality to determine whether a full (or cumulative) impact analysis is necessary before reaching a conclusion as to whether the proposed source would (or would not) cause or contribute to a violation.[46] A modeled result predicting that a proposed source's maximum impact will be below the corresponding SIL value recommended above generally may be considered to be a sufficient demonstration that the proposed source will not cause or contribute to a violation of the applicable NAAQS or PSD increment. If the single-source analysis shows that a proposed source will not have a significant impact on air quality, permitting authorities may

[44] Section 165(d)(2) of the Act sets forth procedures affording special protection against adverse air quality impacts in Class I areas. Also, section 169A of the Act declares a national goal of preventing future and remedying any existing impairment of visibility in Class I areas. 42 U.S.C. 7475 and 7491.

[45] To derive the Class I PSD increment SIL values, we started with the corresponding NAAQS SIL value as the base number and adjusted it by the ratio of the associated Class I and II PSD increments. For the annual $PM_{2.5}$ increment, we reduced the NAAQS SIL value by the ratio of 1:4, because the Class I PSD increment is 1 μg/m^3 and the Class II PSD increment is 4 μg/m^3. We used the ratio of 2:9 for the 24-hour $PM_{2.5}$ increment. For the 24-hour increment, we used the 40 CFR 51.165(b)(2) value of 1.2 μg/m^3 as our base number.

[46] 1990 Draft NSR Workshop Manual at C.24-C.25, C.51.

generally conclude there is no need to conduct a cumulative impact analysis to assess whether there will be any violations of the NAAQS or PSD increment. However, upon considering the permit record in an individual case, if a permitting authority has a basis for concern that a demonstration that a proposed source's impact is below the relevant SIL value at all locations is not sufficient to demonstrate that the proposed source will not cause or contribute to a violation, then the permitting authority should require additional information from the permit applicant to make the required air quality impact demonstration.

Second, where the preliminary analysis described in the prior paragraph shows a significant impact, permitting authorities may choose to use the recommended SIL values in a cumulative impact analysis for a NAAQS, which, in addition to the proposed new major stationary source or major modification, includes the impact of existing sources (onsite with the proposed major modification, as well as other existing sources), and the appropriate background concentration. The EPA has described this application of a SIL as a "culpability analysis."[47] Where a cumulative impact analysis predicts a NAAQS violation, the permitting authority may further evaluate whether the proposed source will cause or contribute to the violation by comparing the proposed source's modeled contribution to that violation to the corresponding SIL value. If the modeled impact is below the recommended SIL value at the violating receptor during the violation, the EPA believes this will be sufficient in most cases for a permitting authority to conclude that the source does not cause or contribute to (is not culpable for) the predicted violation. This demonstration would, thus, allow the permit to be issued if all other PSD requirements are satisfied. If the proposed source's modeled impact is higher than or equal to the recommended SIL value at the violating receptor during a violation, then a permit should not be issued unless (1) further modifications are made to the proposed source to reduce the proposed source's impact to a not significant level at the affected receptor during the violation, or (2) the proposed source obtains sufficient emissions reductions from other sources to compensate for its contribution to the violation.[48]

Third, permitting authorities may decide to use the SIL values recommended above in a cumulative impact analysis for a PSD increment. According to 40 CFR 51.166(c)(1) and 52.21(c), an allowable PSD increment based on an annual average may not be exceeded, and the allowable PSD increment for any other time period may be exceeded once per year at any one location. In either case, the PSD increment SILs recommended above may be used to determine if the proposed source will cause or contribute to that exceedance. If the cumulative impact analysis shows an annual average $PM_{2.5}$ PSD increment exceedance or a 24-hour PSD increment exceedance at a location, then the comparison of the proposed source's impact at that location during the exceedance to the corresponding SIL value may be used to determine whether the proposed source will cause or contribute to the exceedance(s) at that receptor. If the modeled impact is below the SIL for the relevant pollutant, then the permitting authority may conclude that the source does not cause or contribute to a violation of the PSD increment for that pollutant.

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[47] *Prairie State*, 13 E.A.D. at 100; Mississippi Lime, 15 E.A.D. at 374.

[48] 1990 Draft NSR Workshop Manual at C.52-C.53; this latter alternative is referred to as a PSD offset, and state implementation plans may include an offset program based on federal regulations at 40 CFR 51.165(b).

In the past, SILs have been used in defining the spatial extent of the modeling domain for a cumulative impact analysis. Because an impact from a proposed source below a SIL value is considered not to cause or contribute to a violation, the EPA has previously recognized that there was no informational value in placing modeling receptors farther from the proposed source than the most distant point at which the proposed source's impact is equal to or greater than the applicable SIL value. Streamlining the modeling demonstration to reduce the number of receptors to those of value in determining if the proposed source will cause or contribute to a violation of the applicable NAAQS or PSD increment has enabled permit applicants to complete the required modeling with a reasonable effort. As discussed earlier, the EPA recently updated its *Guideline*. The revisions include providing an appropriate, revised basis for determining the modeling domain for NAAQS and PSD increment assessments. Thus, the revised *Guideline* should be used when considering the extent of the modeling domain.

The SILs identified in this guidance should not influence Air Quality Related Values analyses in Class I areas, which are independent reviews by the Federal Land Managers during the application review process.

Subject to limitations described in this guidance, permitting authorities may use the values in the above tables on a case-by-case basis to support air quality analyses and demonstrations required for issuance of PSD permits. Since this guidance is neither a final determination nor a binding regulation, permitting authorities retain the discretion not to use SILs as described here, either in specific cases or programmatically.

The case-by-case use of SIL values should be justified in the record for each permit. To ensure an adequate record, any PSD permitting decision that is based on this guidance (including the technical and legal documents) should incorporate the information contained in them. The permitting authority should also consider any additional information in the record that is relevant to making the required demonstration.

Permitting authorities also retain the discretion to use other values that may be justified separately from this guidance as levels of insignificant impact, subject to one limitation for the $PM_{2.5}$ NAAQS. Since the EPA has established by regulation that a $PM_{2.5}$ impact greater than certain values will cause or contribute to a violation of the relevant NAAQS, permitting authorities may not use a value higher than 1.2 $\mu g/m^3$ for the 24-hour $PM_{2.5}$ NAAQS or a value higher than 0.3 $\mu g/m^3$ for the annual $PM_{2.5}$ NAAQS. Because the 2010 rulemaking constrains the discretion of state and local permitting authorities, the EPA is committed to reassessing 40 CFR 51.165(b)(2) through a future rulemaking process that will begin within 18 months.

Because ozone is not addressed in 40 CFR 51.165(b)(2), permitting authorities are not precluded from developing a higher ozone NAAQS SIL value than recommended in this guidance. Likewise, 40 CFR 51.165(b)(2) does not address PSD increments and, thus, does not constrain the discretion of a permitting authority to use a higher SIL value that a permitting authority may develop for PSD increment purposes. Permitting authorities are also not precluded from developing and using lower SIL values than recommended in this guidance. Permitting authorities may elect to utilize

alternative CIs, based on regional or local factors, in developing their own SIL values. The case-by-case use of a SIL value should be supported by a comparable record in each instance that shows that the value represents a level below which a proposed source does not cause or contribute to a violation of the NAAQS or PSD increment.