



September 21, 2016

**VIA E-MAIL and U.S. MAIL**

Mr. Robert Kaplan  
Acting Regional Administrator  
United States Environmental Protection Agency, Region 5  
77 West Jackson Boulevard (R-19J)  
Chicago, Illinois 60604-3507

**RE: Comments on MDEQ's Sulfur Dioxide One-Hour National Ambient Air Quality Standard State Implementation Plan Submitted to EPA for Approval**

Dear Mr. Kaplan:

Please accept these comments submitted on behalf of Sierra Club and Earthjustice regarding the Michigan Department of Environmental Quality's ("MDEQ's") Sulfur Dioxide One-Hour National Ambient Air Quality Standard State Implementation Plan ("Submitted NSIP" or "Plan"), submitted to EPA on May 31, 2016 for approval and amended with an addendum on June 30, 2016. The Plan is required to address the portion of Wayne County that has been designated as out of attainment ("nonattainment area") with the 1-hour sulfur dioxide ("SO<sub>2</sub>") National Ambient Air Quality Standards ("NAAQS"). MDEQ's Plan falls short of bringing the area into attainment, and does not require enforceable, sufficient reduction in actual SO<sub>2</sub> emissions from major sources in the area. As a result, EPA must deny approval of the Submitted NSIP.

SO<sub>2</sub> pollution poses a serious public health threat in Detroit and Downriver communities. The 1-hour SO<sub>2</sub> NAAQS is intended to alleviate this threat, but will only succeed if EPA expeditiously denies approval of the Submitted NSIP and issues a compliant federal plan that establishes and implements permanently enforceable measures to bring Wayne County into attainment with the standard.

In the Submitted NSIP, MDEQ erroneously claims that its plan will achieve compliance with the federal standard.<sup>1</sup> As detailed in Dr. Andrew Gray's 2016 air quality modeling report, attached, and as discussed further below, MDEQ's Submitted NSIP is fatally deficient for at least the following reasons:

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<sup>1</sup> Michigan Dep't of Env'tl. Quality (MDEQ), *Sulfur Dioxide One-Hour National Ambient Air Quality Standard Nonattainment State Implementation Plan for Wayne County (partial)*, at i (June 30, 2016) (hereinafter "Submitted NSIP") ("this SIP demonstrates attainment with the 1-hour SO<sub>2</sub> NAAQS").

- MDEQ arbitrarily changed the background level of SO<sub>2</sub> used in its modeling to a level that brought the modeling results to just under the federal standard. As Dr. Gray demonstrates, MDEQ did not provide any rationale for this change and an analysis of the data shows that this change is unreasonable. Had MDEQ continued to use the previous and correct background concentration, the modeling would have showed that three hotspots will still persist;
- The proposed limits are based on a 720-hour rolling average when only 1-hour limits can fully ensure compliance with the 1-hour SO<sub>2</sub> NAAQS;
- Even if the use of 720-hour rolling average limits could be adequate, MDEQ failed to properly account in its modeling for the higher emissions that such a long averaging period would allow for, and did not take supplemental steps necessary to reduce the chance of exceedances of the NAAQS that could result from the use of longer averaging times; and
- The Submitted NSIP does not clearly establish permanent and enforceable limits, as required by the Clean Air Act.<sup>2</sup>

In short, the MDEQ's Submitted NSIP fails to demonstrate the attainment of the 1-hour SO<sub>2</sub> NAAQS that is required by law, and unconscionably prolongs the significant public health and environmental justice impacts of excessive SO<sub>2</sub> pollution in Wayne County. MDEQ's inadequate submission, made more than a year after the statutory deadline for such submission, signals that MDEQ has no intention of mandating the more stringent SO<sub>2</sub> emissions limitations that are needed to attain the NAAQS. In such a situation, the U.S. EPA has the legal authority and duty to issue its own Federal Implementation Plan ("FIP") in order to ensure that timely attainment is achieved in Wayne County. As such, EPA must not only reject MDEQ's Submitted NSIP as legally inadequate, but also expeditiously issue a federal plan that will address the pressing health problems posed by excessive SO<sub>2</sub> pollution in Detroit and Downriver communities. Every week of delay means more hospitalizations and missed school and work for Wayne County residents. This delay cannot be permitted to continue.

#### **I. Elevated Levels of Sulfur Dioxide Pollution Pose a Serious Public Health Threat in Wayne County, an Area Long-Overburdened with Pollution.**

Every year, major industrial facilities in the Detroit area emit tens of thousands of tons of SO<sub>2</sub> into the air that people who live, work, and recreate in Detroit and Downriver communities breathe. An overwhelming weight of scientific evidence shows that even short-term exposure to elevated levels of SO<sub>2</sub> pollution poses a serious public health threat. The 1-hour SO<sub>2</sub> NAAQS was established in 2010 to help reduce the exact public health threat that Wayne County residents face every day.

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<sup>2</sup> Dr. H. Andrew Gray, Evaluation of MDEQ's May 31, 2016 Proposed Sulfur Dioxide One-Hour National Ambient Air Quality Standard State Implementation Plan and June 30, 2016 Addendum (Aug. 22, 2016) (hereafter referred to as "2016 Dr. Gray Report"), attached hereto as Exhibit 1.

## A. Sulfur Dioxide Pollution Poses a Serious Public Health Threat.

Current scientific evidence on the harmful health effects of sulfur dioxide is well-established. Sulfur dioxide, a colorless gas with a pungent odor, enters the body primarily through inhalation<sup>3</sup> and reacts with the mucous membranes of the lungs and upper respiratory tract to form sulfurous acid, a severe irritant.<sup>4</sup> According to the Agency for Toxic Substances and Disease Registry (a federal public health agency of the U.S. Department of Health and Human Services):

People with asthma can experience increased airway resistance with sulfur dioxide concentrations of less than 0.1 ppm [“parts per million”] when exercising. Healthy adults experience increased airway resistance at 5 ppm, sneezing and coughing at 10 ppm, and bronchospasm at 20ppm. Respiratory protection is required for exposures at or above 20 ppm. Exposures of 50 to 100 ppm may be tolerated for more than 30 to 60 minutes, but higher or longer exposures can cause death from airway obstruction. Sulfur dioxide is heavier than air; thus, exposure in poorly ventilated, enclosed, or low-lying areas can result in asphyxiation.

Children exposed to the same levels of sulfur dioxide as adults may receive a larger dose because they have greater lung surface area [to] body weight ratios and increased minute volumes [to] weight ratios. In addition, they may be exposed to higher levels than adults in the same location because of their short stature and the higher levels of sulfur dioxide found nearer to the ground and because they are slow to leave the site of an exposure.<sup>5</sup>

Symptoms of sulfur dioxide inhalation include “sneezing, sore throat, wheezing, shortness of breath, chest tightness, and a feeling of suffocation.”<sup>6</sup> Sulfur dioxide respiratory irritation can also induce fluid accumulation in the larynx and lungs and inflammation of lung tissue. Strikingly, many of these adverse respiratory effects can occur even with only short-term exposure to sulfur dioxide (five minutes to 24 hours). The negative health impacts of sulfur dioxide inhalation become much more prevalent in asthmatics, children, the elderly, and those with cardiovascular or chronic lung disease (bronchitis, emphysema), all of whom are especially sensitive to the effects of sulfur dioxide and may be affected by lower concentrations than healthy adults.

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<sup>3</sup> Sulfur dioxide can also be absorbed through the skin and other mucous membranes (like the eyes) where the chemical also acts as an extreme irritant. Agency for Toxic Substances & Disease Registry, *Sulfur Dioxide (SO<sub>2</sub>)* CAS 7446-09-5; UN 1079, at 5-6, available at <http://www.atsdr.cdc.gov/MHMI/mmg116.pdf> (emphasis added) (hereinafter “ATSDR Sulfur Dioxide”).

<sup>4</sup> *Id.* at 1. Sulfur dioxide in the ambient air can also react with other chemicals and convert to a small particle that can lodge deeply in the most sensitive part of the lung. EPA, *Sulfur Dioxide Basics*, available at [https://www.epa.gov/so2-pollution/sulfur-dioxide-basics#what is so2](https://www.epa.gov/so2-pollution/sulfur-dioxide-basics#what%20is%20so2) (last updated Aug. 16, 2016).

<sup>5</sup> ATSDR Sulfur Dioxide at 1-2; see also Agency for Toxic Substances & Disease Registry, *Public Health Statement Sulfur Dioxide* 2-3 (Dec. 1998), available at <http://www.atsdr.cdc.gov/ToxProfiles/tp116-c1-b.pdf>.

<sup>6</sup> ATSDR Sulfur Dioxide at 5.

## **B. The 1-Hour SO<sub>2</sub> NAAQS.**

U.S. EPA promulgated initial primary and secondary NAAQS for SO<sub>2</sub> in 1971.<sup>7</sup> On June 2, 2010, U.S. EPA issued a new SO<sub>2</sub> NAAQS standard, recognizing that the prior 24-hour and annual SO<sub>2</sub> standards did not adequately protect the public against adverse respiratory effects associated with short term (five minutes to 24 hours) SO<sub>2</sub> exposure.<sup>8</sup> The new 2010 SO<sub>2</sub> NAAQS standard is a 1-hour standard set at 196 micrograms per cubic meter (“µg/m<sup>3</sup>”) or 75 parts per billion (“ppb”).<sup>9</sup> The “standard is met...when the three-year average of the annual (99th percentile) of the daily maximum 1-hour average concentrations is less than or equal to 75 ppb.”<sup>10</sup> Due to both the shorter averaging time and the numerical difference, the new 1-hour SO<sub>2</sub> NAAQS is far more stringent than the prior standard. On July 20, 2012, the U.S. Circuit Court of Appeals for the District of Columbia upheld the 1-hour SO<sub>2</sub> NAAQS.<sup>11</sup>

U.S. EPA must set the NAAQS at a level adequate to protect public health with an adequate margin of safety.<sup>12</sup> Relying upon years of research, and an extensive notice and comment process, U.S. EPA established the new 1-hour SO<sub>2</sub> NAAQS because a substantial body of scientific evidence demonstrated that exposure to SO<sub>2</sub> in even very short time periods—such as five minutes—causes decrements in lung function, aggravation of asthma, and respiratory and cardiovascular morbidity, and that the then-existing NAAQS were inadequate to protect public health from such impacts. These findings were thoroughly documented in an Integrated Science Assessment<sup>13</sup> completed as part of the NAAQS evaluation, and in the final NAAQS rule itself.<sup>14</sup> Based on this strong scientific evidence,<sup>15</sup> U.S. EPA has estimated that the 1-hour SO<sub>2</sub> NAAQS will prevent 2,300-5,900 premature deaths and 54,000 asthma attacks a year.<sup>15</sup>

## **C. The Wayne County Non-Attainment Area and its Disproportionate Pollution Burden: an Environmental Justice Crisis.**

The promulgation of the new 1-hour SO<sub>2</sub> NAAQS triggered a process by which U.S. EPA was required within three years to designate areas of the country that are failing to attain the NAAQS.<sup>16</sup> In 2013, after data collected from a monitor located at Southwestern High School

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<sup>7</sup> The EPA originally set the primary standard for SO<sub>2</sub> at 0.14 parts per million (“ppm”), 24-hour average, and 0.03 ppm, annual average. EPA, *Sulfur Dioxide (SO<sub>2</sub>) Primary Standards - Table of Historical SO<sub>2</sub> NAAQS*, available at [http://www.epa.gov/ttn/naaqs/standards/so2/s\\_so2\\_history.html](http://www.epa.gov/ttn/naaqs/standards/so2/s_so2_history.html) (last updated Mar. 4, 2016).

<sup>8</sup> EPA, *Final Rule for the Primary National Ambient Air Quality Standard for Sulfur Dioxide*, 75 Fed. Reg. 35,520, 35,550 (June 22, 2010) (hereinafter “2010 SO<sub>2</sub> NAAQS”).

<sup>9</sup> 40 C.F.R. § 50.17(a).

<sup>10</sup> *Id.* § 50.17(b).

<sup>11</sup> *Nat'l Envtl. Defense Ass'n's Clean Air Project v. EPA*, 686 F.3d 803 (D.C. Cir. 2012).

<sup>12</sup> 42 U.S.C. § 7409(b).

<sup>13</sup> EPA, *Integrated Science Assessment for Sulfur Oxides—Health Criteria*, EPA/600/R-08/047F, at 5-3–5-4, Tables 5-1, 5-2 (2008).

<sup>14</sup> 75 Fed. Reg. at 35,524-29.

<sup>15</sup> EPA, *Final Regulatory Impact Analysis (RIA) for the SO<sub>2</sub> National Ambient Air Quality Standards (NAAQS)*, at 5-35, Table 5.14 (2010).

<sup>16</sup> 42 U.S.C. § 7407(d)(1)(B)(i).

in Detroit (“SWHS Monitor”) showed clear violations of the 2010 NAAQS,<sup>17</sup> a significant area of Wayne County was designated as nonattainment for sulfur dioxide.<sup>18</sup> Notably, in deciding boundaries for the nonattainment area, National Emissions Inventory air data compiled by U.S. EPA showed that the two largest sources of sulfur dioxide in Wayne County were (and are), DTE’s Trenton Channel and River Rouge facilities, which together emit 80 percent of the area’s sulfur dioxide pollution.<sup>19</sup> The designation of the Wayne County non-attainment area (and 28 other 1-hour SO<sub>2</sub> non-attainment areas nationwide) was published in the Federal Register on August 5, 2013, with an effective date of October 4, 2013.<sup>20</sup>

In response to this nonattainment designation, MDEQ began collecting and analyzing monitoring and modeling data from sources of SO<sub>2</sub> in the area in order to prepare the required NSIP.<sup>21</sup> The Submitted NSIP sent to EPA by MDEQ on May 31, 2016 and amended on June 30, 2016,<sup>22</sup> incorporates several of the affected facilities’ air permits and sets emissions limits for the US Steel facility via rule change.<sup>23</sup> In 2012, the MDEQ found the largest sources of SO<sub>2</sub> in the nonattainment area whose modeled impacts exceeded the new standard to be: Carmeuse Lime, U.S. Steel, DTE River Rouge power plant, DTE Trenton Channel power plant, and EES Coke.<sup>24</sup> Excluding DTE Trenton Channel, all the aforementioned sources of SO<sub>2</sub> are located within two miles of the SWHS monitor, and therefore their combined emissions of tens of thousands of tons of SO<sub>2</sub> each year is heavily concentrated within a relatively small geographic area.<sup>25</sup>

The dangers posed to human health by sulfur dioxide pollution are especially concerning in Wayne County, which has been dealing with more than its share of sulfur dioxide and other pollutants for decades. For example, the Wayne County non-attainment area includes what University of Michigan scientists have described as the state’s most polluted ZIP code—the 48217 neighborhood.<sup>26</sup> This neighborhood, like many others in the area, is surrounded by major

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<sup>17</sup> EPA, *Michigan, Area Designations For the 2010 SO<sub>2</sub> Primary National Ambient Air Quality Standard, Technical Support Document (TSD) 5* (2013), available at <https://www.epa.gov/sites/production/files/2016-03/documents/mi-tds.pdf>, attached as Exhibit 2 (hereinafter “MI Technical Support Document”).

<sup>18</sup> The area bounded on the east by the Michigan-Ontario border, on the south by the Wayne County-Monroe County border, on the west by Interstate 75 north to Southfield Road, Southfield Road to Interstate 94, and Interstate 94 north to Michigan Avenue, and on the north by Michigan Avenue to Woodward Avenue and a line on Woodward Avenue extended to the Michigan-Ontario border. EPA, *Air Quality Designations for the 2010 Sulfur Dioxide (SO<sub>2</sub>) Primary National Ambient Air Quality Standard*, 78 Fed. Reg. 47,191-02, 47,201 (Aug. 5, 2013) (hereinafter “EPA SO<sub>2</sub> Designations”).

<sup>19</sup> MI Technical Support Document at 5-6. The seven major emitting facilities within the State Recommended Nonattainment Area emit a total of 52,015 tons of SO<sub>2</sub> per year. The River Rouge and Trenton Channel are responsible for 42,113 tons of SO<sub>2</sub> emitted per year, or 80.96 percent of the total emissions. Combined, these two facilities produce more than six times the sulfur dioxide (in tons per year) than the next highest producing facility in the county. *Id.*

<sup>20</sup> EPA SO<sub>2</sub> Designations, 78 Fed. Reg. at 47,191-92.

<sup>21</sup> States are required, under the CAA to submit a SIP within 18 months after an area has been designated as a “nonattainment area” for a new NAAQS. SIPs contain the state’s plan to ensure the area is brought into attainment within 5 years of its nonattainment designation. Submitted NSIP at 1.

<sup>22</sup> *Id.* at 38.

<sup>23</sup> *Id.* at 42; *see also id.* at Appendices D, E, G, and H.

<sup>24</sup> *Id.* at i, 4.

<sup>25</sup> *Id.* at 4.

<sup>26</sup> Jonathan Oosting, *Detroit's 48217 Zip Code is Michigan's Most Polluted*, available at [http://www.mlive.com/news/detroit/index.ssf/2010/06/must-read\\_report\\_detroits\\_4821.html](http://www.mlive.com/news/detroit/index.ssf/2010/06/must-read_report_detroits_4821.html)

industrial facilities, and pollution from these facilities has cumulative and adverse effects. As documented in U.S. EPA’s technical support document for the Wayne County non-attainment area designation, those major industrial facilities emitted a total of 55,560 tons of SO<sub>2</sub> in 2008, with 42,113 tons of that pollution coming from the River Rouge and Trenton Channel plants alone.<sup>27</sup>

The concentration of a number of large SO<sub>2</sub> emitting facilities in a single neighborhood correlates with the striking prevalence of respiratory disorders in area residents. In 2008, following an exhaustive survey, the Michigan Department of Community Health (“MDCH”) coined Detroit “the epicenter of asthma burden in Michigan,” stating that the severity of the asthma burden in Detroit warrants immediate attention.<sup>28</sup> More specifically, MDCH found that the prevalence of asthma among adults in Detroit was 50% higher than the statewide average.<sup>29</sup> Likewise, rates of asthma hospitalization in Detroit (for both children and adults) were found to be three times higher than that of Michigan as a whole and rates of asthma death over two times higher compared to overall state numbers.<sup>30</sup> The prevalence of asthma in children<sup>31</sup> covered by Medicaid in Detroit was a special focus of MDCH; these children were shown to be 10% more likely to have persistent asthma<sup>32</sup> and 50% more likely to visit the emergency department as a result of asthma than their statewide counterparts.<sup>33</sup>

In addition to these persistent adverse health effects, such pollution has been found to take a toll on educational achievement. Ninety-two schools are located in the nonattainment area. In 2011, a study conducted by the University of Michigan found that air pollution from industrial sources near Michigan public schools (including those in the nonattainment area) jeopardizes not only children’s health, but their academic success, and that minority students bear a disproportionately high share of the air pollution burden. More particularly, “schools located in areas with the highest air pollution levels had the lowest attendance rates—a potential indicator

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<sup>27</sup> MI Technical Support Document at 6.

<sup>28</sup> Elizabeth Wasilevich et al., *Detroit – The Epicenter of Asthma Burden, Epidemiology of Asthma in Michigan*, MDCH 1 (2008) (emphasis added), available at [https://www.michigan.gov/documents/mdch/14\\_Ch12\\_Detroit\\_Epicenter\\_of\\_Asthma\\_276687\\_7.pdf](https://www.michigan.gov/documents/mdch/14_Ch12_Detroit_Epicenter_of_Asthma_276687_7.pdf)

<sup>29</sup> *Id.*

<sup>30</sup> *Id.*

<sup>31</sup> Meaning under the age of 18. *See id.*

<sup>32</sup> Persistent asthma is defined according to HEDIS® specifications: in the year of the prevalence measurement year having (1) ≥4 asthma medication dispensing events OR (2) ≥1 emergency department visits for asthma OR (3) ≥1 hospitalization for asthma OR (4) ≥4 outpatient visits for asthma and ≥2 asthma medication dispensing events. *Id.* at 2.

<sup>33</sup> *Id.* at 1; The increased air pollution is not just impacting Detroit area communities; it is also drifting into communities across the Detroit River in Windsor, Ontario. In fact, Ontario estimates that air pollution results in health costs of near \$1 billion per year and has linked poor air quality in Essex County (which includes Windsor) to at least “260 premature deaths, 900 hospital admissions and 2,750 emergency visits.”

City of Windsor, Ontario, *Illness Costs of Air Pollution*, available at

<http://www.citywindsor.ca/residents/environment/Environmental-Master-Plan/Goal-B-Create-Healthy-Communities/Pages/Illness-Costs-of-Air-Pollution.aspx> (last visited Sept. 7, 2016). One 2005 medical study even associated short term sulfur dioxide exposure to daily cardiac hospital admissions for people over the age of 65 living in Windsor. Karen Y. Fung et al., *Air Pollution and Daily Hospital Admissions for Cardiovascular Diseases in Windsor, Ontario, Canada* J. Pub. Health 29-33 (Jan.-Feb. 2005), available at <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2919554/>.

of poor health—and the highest proportions of students who failed to meet state educational testing standards.”<sup>34</sup> Based on Detroit Public Schools School Nurse Monthly Reports, 18 percent of students have physician-diagnosed asthma, and an estimated 7-10 percent of students have undiagnosed asthma. During the 2003-2004 school year, nurses handled three to five life-threatening asthma episodes per month.<sup>35</sup> The Detroit Alliance for Asthma Awareness lists asthma as the leading chronic condition causing school absenteeism in Detroit, as well as the leading cause of preventable hospitalizations for children under 18.<sup>36</sup> Furthermore, schools located in the most polluted zones also had the highest percentage of minority students – 81.5% of African American students and 62.1% of Hispanic students attended school in places ranked in the top 10% for dirtiest air in the state – only 44.4% of white children experienced the same.

## II. The Clean Air Act’s Non-Attainment State Implementation Plan Requirements

The designation of a portion of Wayne County as non-attainment for the 1-hour SO<sub>2</sub> NAAQS triggered a requirement for MDEQ to submit to EPA a non-attainment state implementation plan (“NSIP”) that sets forth emission limits and other provisions for bringing the area into attainment with the NAAQS.<sup>37</sup> Pursuant to the relevant Clean Air Act provisions, such NSIP must comply with four basic requirements (among others):

- The NSIP must “provide for attainment” of the NAAQS “as expeditiously as practicable,” but in any event within five years of the nonattainment designation.<sup>38</sup>
- The NSIP must require “the implementation of all reasonably available control measures [“RACT”] ... including such reductions in emissions from existing sources in the area as may be obtained through the adoption, at a minimum, of reasonably available control technology [“RACT”];”<sup>39</sup>
- The NSIP must demonstrate that the emissions reductions are “enforceable;”<sup>40</sup> and
- MDEQ must submit an NSIP to EPA for approval within eighteen months of the non-attainment area designation.<sup>41</sup>

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<sup>34</sup> Paul Mohai et al., *Air Pollution Around Schools Is Linked To Poorer Student Health And Academic Performance*, Health Affairs vol. 30, no. 5, 852-62 (May 2011), available at <http://content.healthaffairs.org/content/30/5/852.full.pdf+html>.

<sup>35</sup> American Lung Association, *Detroit, Michigan: Extensive Team Effort throughout an Urban System*, available at <http://www.lung.org/lung-disease/asthma/creating-asthma-friendly-environments/asthma-in-schools/open-airways-for-schools/success-stories/detroit-michigan.html>? (last visited Sept. 30, 2015).

<sup>36</sup> Asthma Initiative of Michigan, *Detroit Alliance for Asthma Awareness: Detroit Asthma Statistics*, available at <http://getasthmahelp.org/detroit-alliance-for-asthma-awareness.aspx> (last visited Sept. 7, 2016).

<sup>37</sup> 42 U.S.C. § 7514(a).

<sup>38</sup> *Id.* § 7514a.

<sup>39</sup> 42 U.S.C. § 7502(c)(1).

<sup>40</sup> 42 U.S.C. § 7410(a)(2)(A)

<sup>41</sup> *Id.* § 7514(a).

Given that the Wayne County non-attainment area designation was effective as of October 4, 2013, MDEQ's deadline for submitting an NSIP to EPA was April 6, 2015. Given that MDEQ failed to timely submit an NSIP that meets the minimum criteria established by the Clean Air Act, U.S. EPA is required to issue a FIP within two years if the state does not correct the deficiency.<sup>42</sup> After the FIP clock begins running, "EPA is not obliged to wait two years or postpone its action even a single day: The Act empowers the Agency to promulgate a FIP 'at any time' within the two-year limit."<sup>43</sup>

EPA's *Guidance for 1-Hour SO<sub>2</sub> Nonattainment Area SIP Submissions* further clarifies the steps a regulatory agency must take to develop a compliant NSIP.<sup>44</sup> In particular, EPA specifies that "for attainment demonstrations for the 2010 SO<sub>2</sub> NAAQS, the air agency should demonstrate future attainment and maintenance of the NAAQS *in the entire area designated as nonattainment (i.e., not just at the violating monitor)* by using air quality dispersion modeling (*see Appendix W to 40 CFR part 51*) to show that the mix of sources and enforceable emission rates in an identified area will not lead to a violation of the SO<sub>2</sub> NAAQS." (emphasis added)<sup>45</sup>

The EPA NSIP Guidance further states that an "approvable attainment demonstration would be an air quality modeling analysis that demonstrates that the emission limits in the plan will suffice to provide for timely attainment of the affected standard," using "allowable emissions."<sup>46</sup>

MDEQ must submit an NSIP that demonstrate the NAAQS will be met at all locations in the nonattainment area while sources are operating up to their legally permissible rate; i.e., allowable" emissions. As MDEQ correctly elaborated in its Draft NSIP:

"To meet the requirements for an attaining SIP, the MDEQ must show via dispersion modeling that the SWHS monitor will meet the NAAQS and no other areas in the nonattainment area will violate the NAAQS. This analysis must use allowable emissions in the modeling. That is, the highest combined impact point, called a "hotspot," resulting from overlapping emission impacts should be reduced to meet the NAAQS."<sup>47</sup>

While MDEQ identified the appropriate requirements, it unfortunately failed to develop a plan that complies with those requirements, as discussed in Section IV, below.

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<sup>42</sup> *Id.* § 7410(c)(1).

<sup>43</sup> *EPA v. EME Homer City Generation, L.P.*, 134 S. Ct. 1584, 1601 (2014).

<sup>44</sup> EPA Office of Air Quality Planning and Standards, *Guidance for 1-Hour SO<sub>2</sub> Nonattainment Area SIP Submissions* (Apr. 23, 2014), available at <http://www.epa.gov/oaqps001/sulfurdioxide/pdfs/20140423guidance.pdf> (hereinafter "EPA NSIP Guidance").

<sup>45</sup> *Id.* at 11-12.

<sup>46</sup> *Id.* at 9-10.

<sup>47</sup> MDEQ, *Air Quality Division, Proposed Sulfur Dioxide One-Hour National Ambient Air Quality Standard State Implementation Plan*, at iv (Aug. 20, 2015) (hereinafter "Draft NSIP").

### III. MDEQ Continually Places the Wishes of Regulated Entities Over Mandating Actions That Are Necessary to Protect Public Health.

MDEQ’s response to the designation of Wayne County as non-attainment for the 1-hour SO<sub>2</sub> NAAQS has substantially weakened over time. First, in the spring and summer of 2014, MDEQ proposed to address each of the major SO<sub>2</sub> sources in the non-attainment area in a single comprehensive plan. The resulting June 2014 Draft included proposed 1-hour SO<sub>2</sub> limits for six major sources in Wayne County and would have come very close to demonstrating compliance with the 1-hour SO<sub>2</sub> NAAQS. Sometime in late 2014, however, MDEQ appears to have abandoned the June 2014 Draft and, instead, has piecemealed the NSIP process through individual permit modifications that reflect what emitters are voluntarily willing to accept for the various sources of SO<sub>2</sub> pollution. This latter approach does not produce a nonattainment plan that meets the minimum criteria established by law.

#### A. The June 2014 Draft

In June 2014, MDEQ issued a draft NSIP rule (hereinafter the June 2014 Draft) that included stringent 1-hour SO<sub>2</sub> emission limits that are readily achievable at River Rouge, Trenton Channel, and other pollution sources, and which would have brought the area close to attainment.<sup>48</sup> The June 2014 Draft proposed the following limits for major SO<sub>2</sub> sources in the Wayne County non-attainment area:

<b>SOURCE</b>	<b>Proposed Limit in lbs/hr</b>	<b>% Reduction From Baseline</b>
River Rouge Unit 2	1,260	65%
River Rouge Unit 3	1,473	65%
Trenton Channel 9A	4,162	45%
Trenton Channel 16-19	2,776	45%
U.S. Steel Reheat Furnaces	148	83%
Zug Island Boiler House 1	15	88%
Zug Island Boiler House 2	21	75%
EES Coke	272	50%
Carmeuse Lime	259 + 80-foot stack	Reduced impact from increased stack height

Consistent with the 1-hour nature of the SO<sub>2</sub> NAAQS, all of the limits in the June 2014 NSIP were proposed on a 1-hour basis.

<sup>48</sup> MDEQ, *Part 4 Emission Limitations and Prohibitions – Sulfur Bearing Compounds – Draft* (June 14, 2014); attached as Exhibit 3 (hereinafter “June 2014 NSIP”).

As discussed in the attached 2015 expert report from Dr. Andrew Gray (hereafter referred to as Dr. Gray 2015 Report), MDEQ's own AERMOD modeling revealed that the limits proposed in the June 2014 draft would have gotten Wayne County close to attainment, with SO<sub>2</sub> concentrations at the peak cumulative hotspot falling from a baseline of 362.1 ppb to 78.7 ppb, which is over the limit of 75 ppb.<sup>49</sup> A few minor improvements to the June 2014 Draft would enable the plan to demonstrate compliance with the 1-hour SO<sub>2</sub> NAAQS.

## **B. MDEQ's August 2015 Draft NSIP**

Rather than continue to promulgate the June 2014 Draft, however, MDEQ changed direction. MDEQ contends that the June 2014 Draft was merely a "backstop" created in order to encourage polluters to voluntarily commit to the needed reductions, and that its proposed NSIP was based on the level of voluntary commitments it was able to secure.<sup>50</sup> Internal correspondence between MDEQ and the regulated entities shows those entities were not willing to agree to the limits proposed in the June 2014 Draft, and that MDEQ accepted both the regulated entities' proposed limits as well as the method by which those entities wanted those limits to be incorporated into the SIP.<sup>51</sup> Under its new approach, MDEQ added new SO<sub>2</sub> limits to permits for individual sources, and proposed to incorporate the SO<sub>2</sub> limits from the modified permits into its 2015 Draft Plan. MDEQ's August 2015 Draft NSIP made the following changes from the June 2014 Draft:<sup>52</sup>

- The proposed emission limits for River Rouge increased approximately 45% compared to the June 2014 NSIP, to a combined emissions limit of 3,980 lbs/hour for Units 2 and 3.
- For Trenton Channel, MDEQ proposed a limit of 5,907 lbs/hr for all five boilers combined, while the June 2014 Draft would have had a separate limit for Unit 9A than for the other four boilers. Given that DTE has announced its plan to shut down Units 16-19, the net result was to increase the limit for Unit 9A from the 4,162 lbs/hr proposed in the June 2014 NSIP to 5,907 lbs/hr.
- The emission limits for River Rouge and Trenton Channel were based on a 720-hour rolling average, rather than a 1-hour basis.

The August 2015 Draft NSIP limits, when modeled, revealed a maximum cumulative hotspot of 98.1 ppb, with a hotspot at the SWHS monitor of 87.6 ppb.<sup>53</sup>

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<sup>49</sup> Dr. H. Andrew Gray, *Comments on MDEQ's Proposed Sulfur Dioxide One-Hour National Ambient Air Quality Standard State Implementation Plan (dated August 20, 2015)*, at 3 (Oct. 5, 2015), attached as Exhibit 4 (hereinafter "Dr. Gray 2015 Report").

<sup>50</sup> MDEQ Email Communications at 9 (Email from Robert Irvine, Env'tl. Manager, Strategy Dev. Unit, MDEQ Air Quality Division, to Jeffrey Korniski, "RE: Update on DTE - River Rouge & Trenton Channel" (Nov. 3, 2014 11:25 AM), attached as Exhibit 5 (hereinafter "MDEQ Emails").

<sup>51</sup> *Id.* at 7-8 (Email from Robert Irvine to Melissa Byrnes, "RE: Update on DTE - River Rouge & Trenton Channel (Oct. 31, 2014 4:10 PM). ("It appears at this point that we will be accepting the values [DTE is] proposing....").

<sup>52</sup> Draft NSIP at 7-12.

<sup>53</sup> *Id.* at 37.

### C. MDEQ's Submitted NSIP

On May 31, 2016, MDEQ submitted to the U.S. EPA for review and approval *Michigan's 2010 Sulfur Dioxide One-Hour National Ambient Air Quality Standard Nonattainment State Implementation Plan for Wayne County (partial)*.<sup>54</sup> The May 2016 submittal contained the final NSIP requirements for all emitters except for U.S. Steel.<sup>55</sup> On June 30, 2016, MDEQ submitted an Addendum to Michigan State Implementation Plan (SIP) submittal for Michigan's 2010 National Ambient Air Quality Standard (NAAQS) Sulfur Dioxide (SO<sub>2</sub>) Nonattainment Area. This addendum contains final Rule 430 (Appendix E), which is the SO<sub>2</sub> control plan for U.S. Steel.<sup>56</sup>

The Submitted NSIP differs from the August 2015 Draft NSIP in three main ways. First, MDEQ revised the meteorological data that was used in the modeling.<sup>57</sup> In its 2014 Draft and 2015 Draft NSIP, MDEQ used meteorological data from the Detroit airport from 2010-2012.<sup>58</sup> In the Submitted NSIP, MDEQ used meteorological data from the same airport but for years 2010-2014.<sup>59</sup> Modeling of the base case emissions from the 2008-2012 data resulted in a design value concentration of 355 parts per billion.<sup>60</sup> The new meteorological data resulted in a design value of 337 parts per billion.<sup>61</sup>

Second, MDEQ used a lower background concentration in the modeling, described in detail below.<sup>62</sup> Specifically, the August 2015 Draft NSIP (as well as the 2014 Draft), used a background concentration of 15 ppb.<sup>63</sup> This was based on measured concentration data from the Allen Park monitor.<sup>64</sup> MDEQ arbitrarily adjusted this background concentration value, without any explanation.<sup>65</sup> The air dispersion modeling that supports the Submitted NSIP arbitrarily adjusts this number down so that the background concentration is 12 ppb.<sup>66</sup> If MDEQ had used the same background concentration that it used in the June 2014 Draft and the August 2015 Draft NSIP, its modeling would not have shown attainment.<sup>67</sup>

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<sup>54</sup> MDEQ, *Sulfur Dioxide One-Hour National Ambient Air Quality Standard Nonattainment State Implementation Plan for Wayne County (partial)* (May 31, 2016).

<sup>55</sup> *Id.*; see also Letter from Keith Creagh, MDEQ Director, to Robert Kaplan, Acting Administrator, EPA, Region 5 (June 30, 2016), available at [http://www.michigan.gov/documents/deq/deq-aqd-sip-wayne\\_county\\_so2\\_cover\\_letter\\_addendum\\_528406\\_7.pdf#page=1](http://www.michigan.gov/documents/deq/deq-aqd-sip-wayne_county_so2_cover_letter_addendum_528406_7.pdf#page=1).

<sup>56</sup> *Id.*

<sup>57</sup> Dr. Gray 2016 Report at 1.

<sup>58</sup> *Id.*

<sup>59</sup> *Id.*

<sup>60</sup> *Id.*

<sup>61</sup> *Id.*

<sup>62</sup> *Id.* at 2.

<sup>63</sup> *Id.*

<sup>64</sup> *Id.*

<sup>65</sup> *Id.* at 7

<sup>66</sup> *Id.* at 2.

<sup>67</sup> *Id.* at 2-3.

Third, MDEQ included additional emission limitations that MDEQ has incorporated into Renewable Operating Permits and Permits to Install for certain facilities.<sup>68</sup> Specifically, MDEQ required the River Rouge plant to reduce its emissions by 45%, which simply reflects DTE’s announced plan to shut down River Rouge unit 2.<sup>69</sup> For Trenton Channel, MDEQ has kept the same limit that was in the 2015 Draft NSIP of 5,907 lbs/hr for all five boilers combined even though the company has retired four of those boilers.<sup>70</sup> Finally, MDEQ required the Carmeuse Lime facility to increase its stack height to 120 feet.<sup>71</sup>

#### **IV. MDEQ’s Submitted NSIP Fails to Satisfy the Clean Air Act.**

MDEQ contends that its Submitted NSIP describes the “control strategies [voluntarily] adopted by the affected companies, and how these controls” will bring the area into attainment. But the source emissions limits included in the Submitted Plan —particularly those for the River Rouge and Trenton Channel coal-fired power plants—are inadequate to achieve attainment, as shown by Dr. Gray’s 2016 Report.<sup>72</sup> Moreover, the Plan contains several other fatal flaws, including MDEQ’s failure to establish 1-hour emissions limits or to set supplemental standards that will ensure the 720-hour averaging times will not lead to substantial violations of the NAAQS and its failure to establish that the proposed emissions limits are permanent and enforceable.<sup>73</sup>

##### **A. The Draft NSIP Does Not Provide for Attainment.**

Under the Clean Air Act, MDEQ must submit an NSIP that “provides for attainment” of the NAAQS “as expeditiously as practicable,” but in any event within five years of the nonattainment designation.<sup>74</sup> Such NSIP is further required to include “enforceable emission limitations, and such other control measures, means or techniques . . . as may be necessary or appropriate to provide for attainment . . . .”<sup>75</sup> While the Submitted Plan includes emission limits, those limits are insufficient to provide for attainment.

##### **1. MDEQ Fabricated its Attainment Demonstration by Arbitrarily Lowering the Background Concentration of SO<sub>2</sub> to the Exact Level that Would Show Attainment.**

A fundamental flaw with MDEQ’s Submitted NSIP is that the MDEQ arbitrarily and erroneously changed a key assumption, the background SO<sub>2</sub> concentration level, in its AERMOD modeling.<sup>76</sup> This change allowed MDEQ to fabricate attainment results as the arbitrarily changed

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<sup>68</sup> *Id.* at 1-2.

<sup>69</sup> *Id.* at 1.

<sup>70</sup> *Id.* at 2.

<sup>71</sup> *Id.*

<sup>72</sup> *Id.* at 2-15

<sup>73</sup> *Id.* at 16-22.

<sup>74</sup> 42 U.S.C. § 7514a.

<sup>75</sup> 42 U.S.C. § 7502(c)(6).

<sup>76</sup> Dr. Gray 2016 Report at 2-9.

background level of SO<sub>2</sub> brought the modeling results to just under the federal standard.<sup>77</sup> Had MDEQ continued to use the previous and correct background concentration, the modeling would have showed that three hotspots will still persist under its Submitted NSIP – i.e., areas in which air quality modeling demonstrates that SO<sub>2</sub> concentrations would remain above the 1-hour SO<sub>2</sub> NAAQS standard of 75 ppb.<sup>78</sup> As MDEQ acknowledges,

[t]o meet the requirements for an attaining SIP, the MDEQ must show via dispersion modeling that the SWHS [Southwestern High School] monitor will meet the NAAQS and no other areas in the nonattainment area will violate the NAAQS. This analysis must use allowable emissions in the modeling. That is, the highest combined impact point, called a “hotspot,” resulting from overlapping emission impacts should be reduced to meet the NAAQS.<sup>79</sup>

As explained in his expert report, attached as Exhibit 1, Dr. Gray reviewed the AERMOD modeling conducted by MDEQ of its Submitted Plan. Dr. Gray’s review confirmed that the modeled design value, which represents the highest cumulative hotspot, for the limits proposed under the Draft Plan is 73.7 ppb, just below the 1-hour SO<sub>2</sub> NAAQS limit of 75 ppb.<sup>80</sup> MDEQ reduced the assumed background concentration from 15 to 12 ppb.<sup>81</sup> Using the 15 ppb background level, but otherwise including the updated emission limits and meteorological data, demonstrates nonattainment at three of the hotspot locations.<sup>82</sup>

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<sup>77</sup> *Id.* at 2-3.

<sup>78</sup> *Id.*

<sup>79</sup> Draft NSIP at iv, v; *see also* EPA NSIP Guidance at 11-12 (stating that “...for attainment demonstrations for the 2010 SO<sub>2</sub> NAAQS, the air agency should demonstrate future attainment and maintenance of the NAAQS in the entire area designated as nonattainment (*i.e.*, not just at the violating monitor) by using air quality dispersion modeling (*see* Appendix W to 40 CFR part 51) to show that the mix of sources and enforceable emission rates in an identified area will not lead to a violation of the SO<sub>2</sub> NAAQS.”).

<sup>80</sup> Dr. Gray 2016 Report at 3, Table 1 (“Modeled 1-Hour SO<sub>2</sub> NAAQS Design Values at Hotspot Locations”).

<sup>81</sup> *Id.* at 2.

<sup>82</sup> *Id.* at 2-3; *see also id.* at 3, Table 1.

	Modeled Design Value (ppb)						
<b>Zug Island Hotspot</b>	70.5	71.5	72.5	73.5	74.5	<b>75.5</b>	<b>76.5</b>
<b>Carmeuse Hotspot</b>	72.2	73.2	74.2	<b>75.2</b>	<b>76.2</b>	<b>77.2</b>	<b>78.2</b>
<b>SEV/DIG Hotspot</b>	72.5	73.5	74.5	<b>75.5</b>	<b>76.5</b>	<b>77.5</b>	<b>78.5</b>
<b>US Reheat Furnaces Hotspot</b>	73.7	74.7	<b>75.7</b>	<b>76.7</b>	<b>77.7</b>	<b>78.7</b>	<b>79.7</b>
<b>Trenton Hotspot</b>	69.9	70.9	71.9	72.9	73.9	74.9	<b>75.9</b>
<b>Assumed Background</b>	<b>12.0</b>	<b>13.0</b>	<b>14.0</b>	<b>15.0</b>	<b>16.0</b>	<b>17.0</b>	<b>18.0</b>
<b>Zug Island Cumulative</b>	58.5	58.5	58.5	58.5	58.5	58.5	58.5
<b>Carmeuse Cumulative</b>	60.2	60.2	60.2	60.2	60.2	60.2	60.2
<b>SEV/DIG Cumulative</b>	60.5	60.5	60.5	60.5	60.5	60.5	60.5
<b>US Reheat Furnaces Cumulative</b>	61.7	61.7	61.7	61.7	61.7	61.7	61.7
<b>Trenton Cumulative</b>	57.9	57.9	57.9	57.9	57.9	57.9	57.9

**Table 1. Modeled 1-Hour SO<sub>2</sub> NAAQS Design Values at Hotspot Locations**

The reduction in the assumed background concentration is the result of two changes in data or methodology.<sup>83</sup> First, its previous versions of the NSIP, MDEQ based its assumed SO<sub>2</sub> background level on design values developed from 2008-2010 data, 2010-2012 data, and 2011-2013 data (the June 2014 Draft was based on data from 2008-2012 and the 2015 Draft NSIP was based on data from 2010-2013).<sup>84</sup> Its analysis of each of those concentration data sets resulted in an assumed background SO<sub>2</sub> concentration of 15 ppb.<sup>85</sup> In the May 2016 Submitted NSIP, MDEQ updated the Allen Park data to include hourly concentration data from 2014.<sup>86</sup> The Submitted NSIP indicates that the revised background level was based on design values developed for 2010-2012, 2011-2013, and 2012-2014, and the assumed background level is now 12.<sup>87</sup>

Second, MDEQ based the revised background level on a set of calculations in which 1-hour SO<sub>2</sub> NAAQS “design values” for the Allen Park monitor were computed after a significant number of hourly concentrations were first removed from the hourly concentration data—far more than MDEQ removed from the modeling that supported the 2015 Draft NSIP.<sup>88</sup> In order to develop design values reflecting upwind (background) sources that do not include the modeled sources, MDEQ attempted to exclude hourly SO<sub>2</sub> concentrations when the wind was blowing from sources explicitly included in the modeling.<sup>89</sup> As stated in the Submitted SIP, “[u]sing this

<sup>83</sup> Dr. Gray 2016 Report at 2.

<sup>84</sup> *Id.*

<sup>85</sup> *Id.*

<sup>86</sup> *Id.*

<sup>87</sup> *Id.*

<sup>88</sup> *Id.* at 3.

<sup>89</sup> *Id.*

methodology, the spreadsheet ignores all hours (and associated preceding hour) when the wind direction is between 40 degrees and 205 degrees.”<sup>90</sup>

For the August 2015 Draft NSIP, MDEQ’s modeling excluded angle range was between 40 and 180 degrees.<sup>91</sup> For the Submitted SIP, MDEQ changed the excluded wind direction range to 40-205 degrees. MDEQ provided absolutely no explanation for the change.<sup>92</sup> Examination of the pollution roses, as described in Dr. Gray’s report, for Allen Park shows that 40-180 degrees is the appropriate range to use in order to exclude impacts from the large sources included in the model and that use of a larger range does not exclude impacts from other large modeled sources.

Changing the range of excluded angles from 40-180 degrees to 40-205 degrees had a significant effect on the resulting background SO<sub>2</sub> design values for 2010-2012 and 2011-2013. Using the previous 40-180 degree range for excluded angles resulted in average design values of 15 ppb for 2010-2012 and 14 ppb for 2011-2013, either of which results in hotspots not attaining the federal standard.<sup>93</sup>

There are three reasons why MDEQ’s unexplained exclusion of more angles is inappropriate. First, as shown in Figures 1 and 2 from Dr. Gray’s 2016 Report, the most recent pollution rose (2015) for Allen Park appears to show even less of a tendency for high SO<sub>2</sub> concentrations to be associated with wind directions greater than 180 degrees than during earlier years (2012-2014).<sup>94</sup> The pollution roses in Figures 1 and 2 clearly demonstrate that excluding wind directions between 40 and 180 degrees will sufficiently exclude impacts from the large sources located to the southeast of the Allen Park monitor (Trenton and/or Monroe).<sup>95</sup>

Second, there is an inherent problem with MDEQ’s methodology. The nature of the 1-hour SO<sub>2</sub> NAAQS requires that peak (99<sup>th</sup> percentile) daily values be used both for the modeled design values and for determination of the appropriate background levels.<sup>96</sup> Excluding hours in which the wind direction angle may include impacts from the modeled sources necessitates removing most of the highest concentrations recorded at Allen Park.<sup>97</sup> The background design value is then determined as the 4<sup>th</sup> highest remaining daily peak 1-hour concentration.<sup>98</sup>

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<sup>90</sup> Submitted NSIP at 21.

<sup>91</sup> Dr. Gray 2016 Report at 3.

<sup>92</sup> *Id.* at 7; *See also, e.g., Encino Motorcars, LLC v. Navarro*, 136 S. Ct. 2117, 2125–26 (2016) (“When an agency changes its existing position, it ‘need not always provide a more detailed justification than what would suffice for a new policy created on a blank slate.’ But the agency must at least ‘display awareness that it is changing position’ and ‘show that there are good reasons for the new policy.’ In explaining its changed position, an agency must also be cognizant that longstanding policies may have ‘engendered serious reliance interests that must be taken into account.’ In such cases it is not that further justification is demanded by the mere fact of policy change; but that a reasoned explanation is needed for disregarding facts and circumstances that underlay or were engendered by the prior policy.’ It follows that an ‘[u]nexplained inconsistency’ in agency policy is ‘a reason for holding an interpretation to be an arbitrary and capricious change from agency practice.’”) (internal citations omitted)

<sup>93</sup> Dr. Gray 2016 Report at 3.

<sup>94</sup> *Id.* at 4, 7.

<sup>95</sup> *Id.*

<sup>96</sup> *Id.* at 7.

<sup>97</sup> *Id.*

<sup>98</sup> *Id.*

As an example, the design value (99<sup>th</sup> percentile daily peak) of the complete Allen Park data set was 40 ppb during 2013 (and the maximum hourly concentration was 66 ppb), whereas the design value (99<sup>th</sup> percentile) concentration was only 16 ppb after concentrations from 111 days were removed by excluding wind directions between 40 and 205 degrees.<sup>99</sup> Days were excluded if less than 8 hours during the day had valid concentrations (concentrations were valid if the wind direction in that hour and the preceding hour was not between 40 and 205 degrees). The maximum hourly concentration in the resulting distribution (after 111 days were excluded) was 24 ppb, which was the 17<sup>th</sup> highest daily peak concentration in the original unaltered data set.<sup>100</sup> The design value (approximately the 4<sup>th</sup> highest daily peak) of the remaining data (16 ppb) would be the 44<sup>th</sup> highest daily peak in the original unaltered data.<sup>101</sup> The remaining distribution of the lower concentrations at Allen Park cannot reliably be used to represent the 99<sup>th</sup> percentile (peak impact) of the background level.<sup>102</sup>

Finally, expanding the range of excluded angles creates too much uncertainty to represent a reasonable approach.<sup>103</sup> The three-year average (2012-2014) design values for various excluded wind direction ranges were plotted by Dr. Gray, see Figure 1 below.<sup>104</sup> The plot shows the three-year average design value for each pair of lower excluded angle (along the right axis) and upper excluded angle (along the lower axis).<sup>105</sup> The plot illustrates the sensitivity of the background design value to the selection of the excluded angle range.<sup>106</sup> This further demonstrates that MDEQ's selection of 40-205 degrees results in a highly uncertain estimate for the background level.

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<sup>99</sup> *Id.* at 8.

<sup>100</sup> *Id.*

<sup>101</sup> *Id.*

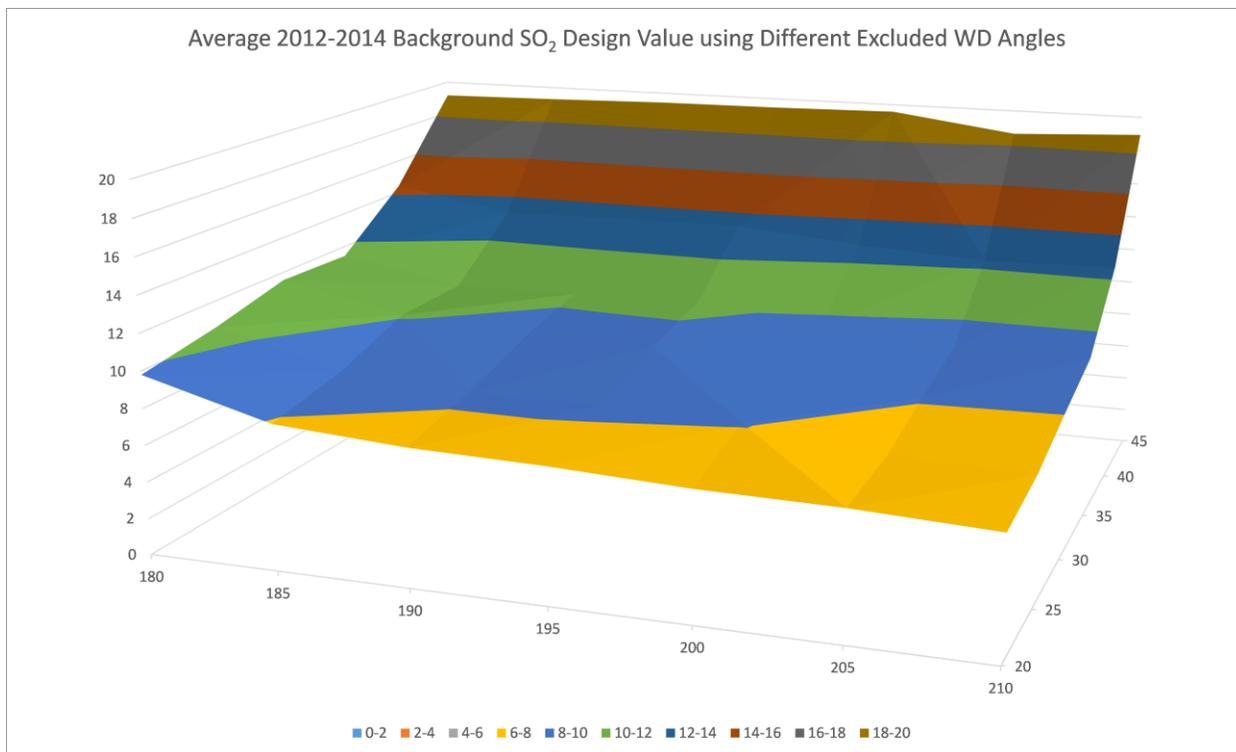
<sup>102</sup> *Id.*

<sup>103</sup> *Id.* at 9.

<sup>104</sup> *Id.*

<sup>105</sup> *Id.*

<sup>106</sup> *Id.*



**Figure 1. Average Background SO<sub>2</sub> Design Values for 2012-2014 Using Allen Park Concentration Data with Varying Excluded Wind Direction Angles**

**2. MDEQ Has Failed to Account For the 1-Hour Basis of the SO<sub>2</sub> NAAQS in Proposing Emission Limits with Far Longer Averaging Times.**

A second major deficiency with the limits in the Submitted NSIP is that they are set on a 720-hour rolling average basis, rather than on a 1-hour basis. As Dr. Gray explains, given that the SO<sub>2</sub> NAAQS is a 1-hour standard, the only way to fully ensure compliance with the 1-hour NAAQS would be to also limit emissions on an hourly basis at an emission rate that demonstrates attainment when modeled.<sup>107</sup> This is because averaging an SO<sub>2</sub> limit over a longer period of time would allow for spikes in emissions that could cause exceedances of the 1-hour NAAQS. MDEQ initially recognized the need for 1-hour SO<sub>2</sub> limits in its June 2014 Draft,<sup>108</sup> but has now removed that aspect of the limits in its final proposal.

Even assuming that the limits in the Submitted NSIP were numerically adequate—which, as discussed above, they are not—allowing such limits to be averaged over a 720-hour timeframe would likely permit violations of the 1-hour SO<sub>2</sub> NAAQS because hours of excess emissions that cause violations of the NAAQS could be balanced out with hours of operation below emission

<sup>107</sup> Dr. Gray 2016 Report at 16.

<sup>108</sup> June 2014 NSIP.

limits.<sup>109</sup> Such a result would contravene the very basis for U.S. EPA’s promulgation of the 1-hour SO<sub>2</sub> standard—its recognition that there is a causal relationship between respiratory morbidity and short-term (5-minutes to 24-hours) exposure to SO<sub>2</sub> and acknowledgment that even five minute emission peaks can result in adverse respiratory effects.<sup>110</sup> Given the demonstrated negative effects of even short-term exposure to elevated SO<sub>2</sub> levels, and the establishment of a 1-hour NAAQS, 1-hour emission limits are needed to ensure that compliance is attained.<sup>111</sup>

It is true that EPA recently concluded in its guidance regarding 1-hour SO<sub>2</sub> NSIPs that emission limit averaging times of up to 30 days may be permissible under certain conditions and upon meeting added burdens.<sup>112</sup> Most significantly, EPA guidance provides that “any emissions limits based on averaging periods longer than 1 hour” must be commensurately lower so as to have “comparable stringency to a 1-hour average limit,” and then sets forth a detailed methodology for calculating the downward adjustment needed to convert a 30-day limit to a 1-hour limit of “comparable stringency.”<sup>113</sup> But even assuming, for the sake of argument, that emission limits based on a 720-hour averaging time could demonstrate attainment with a 1-hour NAAQS, the limits in the Submitted NSIP do not do so because MDEQ failed to ensure that the 720-hour emission limits are of comparable stringency to the 1-hour limits that are needed to achieve attainment. As explained by Dr. Gray in his 2016 report, while MDEQ purported to adjust the proposed 720-hour limits for River Rouge and Trenton Channel to higher 1-hour emission rates for purposes of carrying out the air quality modeling of the Submitted NSIP, the agency’s calculation and application of the adjustment ratio was flawed in a number of critical ways.

First, in addition to using an adjustment ratio, EPA also recommends that the regulatory agency evaluate how frequently the longer averaging time will result in exceedances of the NAAQS, but MDEQ has not done so.<sup>114</sup> EPA’s guidance states:

“[T]he EPA believes that air agencies that use longer term average limits should provide additional justification for the application of such limits. The EPA expects to consider the following factors in evaluating the adequacy of plans with limits based on longer averaging times: (1) whether the numerical value of the mass emissions limit averaged over a longer time is comparably stringent to a 1-hour limit at the critical emission value; and (2) whether the longer term average limit, potentially in combination with other limits, can be expected to constrain emissions sufficiently so that any occasions of

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<sup>109</sup> Dr. Gray 2016 Report at 16-22.

<sup>110</sup> See 75 Fed. Reg. at 35,525-26.

<sup>111</sup> See, e.g., *In re: Mississippi Lime Co.*, 2011 WL 3557194, at \*26-27 (U.S. EAB Aug. 9, 2011) (holding that SO<sub>2</sub> emission limits should be based on hourly averaging times and rejecting an agency’s attempt to use a 3-hour averaging time because “[e]mission limits should be based on concentration estimates for the averaging time that results in the most stringent control requirements. 40 C.F.R. pt. 51, app. W, § 10.2.3.1.a.”)

<sup>112</sup> EPA NSIP Guidance at 22-36.

<sup>113</sup> *Id.* at 24-25.

<sup>114</sup> EPA NSIP Guidance at 28.

emissions above the critical emission value will be limited in frequency and magnitude and, if they occur, would not be expected to result in NAAQS violations."<sup>115</sup>

EPA further clarified that:

“EPA’s general expectation [is] that, if periods of hourly emissions above the critical emission value are a rare occurrence at a source, particularly if the magnitude of the emissions is not substantially higher than the critical emissions value, these periods would be unlikely to have a significant impact on air quality, insofar as they would be very unlikely to occur repeatedly at the times when the meteorology is conducive for high ambient concentrations of SO<sub>2</sub>.”<sup>116</sup>

Even assuming that such longer averaging times could be appropriate in certain circumstances, MDEQ has made no effort to evaluate whether the magnitude and frequency of periods of hourly emissions above the critical emissions value are likely to occur with the 720-hour averaging times. Instead, MDEQ simply derived an adjustment ratio based on historical data between peak 1-hour average and peak 720-hour average emission rates.<sup>117</sup>

Second, even if it were acceptable for MDEQ to rely only on an adjustment ratio, the agency failed to properly apply the ratio for River Rouge Unit 3.<sup>118</sup> The most recent permit for River Rouge includes a 720-hour SO<sub>2</sub> emission rate limit for Unit 3 of 2,300 pounds per hour. For its attainment demonstration, MDEQ modeled an hourly rate of 2,517.3 lb/hr, which is equivalent to a ratio of 1.09.<sup>119</sup> In other words, the proposed permitted 720-hour emission limit was only scaled by 1.09 when determining the appropriate adjusted hourly emission rates for River Rouge Unit 3 to plug into the model.<sup>120</sup> This is inaccurate. But according to MDEQ’s own calculations using the 43 months of data (Jan 2011 – July 2014), the adjustment ratio for River Rouge should have been 1.18.<sup>121</sup> While MDEQ’s methodology for identifying the 1.18 adjustment ratio is flawed as discussed further below, even using that 1.18 ratio, the agency should have set the River Rouge Unit 3 720-hour emission limit at 2,133.3 lbs (which is 2,517.3/1.18), or modeled River Rouge Unit 3 with an hourly rate of 2,714 lb/hr (= 2,300 \* 1.18).<sup>122</sup> Failure to use the right ratio decreased the modeled impacts from this facility by approximately 8 percent.<sup>123</sup>

Third, MDEQ’s methodology for calculating the adjustment ratio does not account for the potential variability in Trenton Channel and River Rouge’s operating patterns.<sup>124</sup> The ratio that MDEQ uses represents the historical statistical relationship of the operating patterns and

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<sup>115</sup> *Id.* at 27-28.

<sup>116</sup> *Id.* at 24.

<sup>117</sup> Dr. Gray 2016 Report at 16.

<sup>118</sup> *Id.*

<sup>119</sup> *Id.*

<sup>120</sup> *Id.* at 17.

<sup>121</sup> *Id.*

<sup>122</sup> *Id.*

<sup>123</sup> *Id.*

<sup>124</sup> *Id.*

provides an estimate of the 1-hour max given an observed 720-hour average. Using 43 months of data, MDEQ found 1-hour/720-hour ratios of 1.18 (River Rouge) and 1.15 (Trenton Channel).<sup>125</sup> Dr. Gray examined the 2014 hourly emission data for River Rouge and found that the ratios of the 99th percentiles for the 1-hour and 720-hour rolling averages of 1.32 (Unit 2) and 1.44 (Unit 3).<sup>126</sup> To show the impact of using the more appropriate 99<sup>th</sup> percentile data in calculating the adjustment ratios, Dr. Gray modeled River Rouge Unit 3 impacts using the hourly/720-hour average ratio from the 2014 data of 1.44 and found that MDEQ would have either needed to set a 720-hour emission limit of 1,748 lbs (=2,517.3/1.44), or modeled River Rouge Unit 3 with an hourly emission rate of approximately 3,312 lb/hr, which is 32 percent greater than the rate MDEQ actually modeled (2,517.3 lb/hr).<sup>127</sup> Increasing the modeled impacts from River Rouge by 32 percent (the SO<sub>2</sub> impacts are proportional to the modeled emission rates) would increase the overall modeled SO<sub>2</sub> design value concentrations above the nonattainment threshold (even using MDEQ's new arbitrary background level of 12 ppb).<sup>128</sup>

Fourth, and most importantly, Dr. Gray conclusively showed that MDEQ's methodology does not effectively provide ANY limit for the hourly emission rate at the area's largest sources, Trenton Channel and River Rouge.<sup>129</sup> To demonstrate that the 720-hour averaging times provide essentially no limit, Dr. Gray examined the River Rouge plant. The 2014 emission data for River Rouge shows many "down" periods for each unit, in which the emission rate was zero for multiple hours and often for multiple days on end. For instance, Unit 2 recorded non-zero emissions for only 60 percent of the hours during 2014, and Unit 3 recorded non-zero emissions for 79 percent of the total hours.<sup>130</sup> The result is that most of the 720-hour averages consist of far less than 720 hours of actual unit operation. For example, only 14 percent of the 720-hour rolling average emission rates for Unit 2 consisted of all 720 non-zero values, and only 20 percent of the 720-hour averages for Unit 3 consisted of all 720 non-zero values.<sup>131</sup> For Unit 2, 39 percent of the 720-hour rolling averages during 2014 consisted of less than 540 non-zero hours (i.e., more than 180 hours were zero).<sup>132</sup> For Unit 3, 35 percent of the 720-hour rolling averages during 2014 consisted of less than 540 non-zero hours.<sup>133</sup>

During these periods, the "effective" hourly emission rate limit is increased because emissions during times of operation are averaged for at least part of the 720 hours against times of zero emissions because the unit is not operating.<sup>134</sup> The result is that by allowing non-operating hours to be factored into the 720-hour average, there is almost no limit (or at least an extremely high limit) being placed on the individual one-hour averages.<sup>135</sup> Mathematically, the hourly average emission rates during those hours when the unit is operating are NOT constrained

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<sup>125</sup> *Id.*

<sup>126</sup> *Id.*

<sup>127</sup> *Id.*

<sup>128</sup> *Id.* at 17-18.

<sup>129</sup> *Id.* at 18.

<sup>130</sup> *Id.*

<sup>131</sup> *Id.*

<sup>132</sup> *Id.*

<sup>133</sup> *Id.*

<sup>134</sup> *Id.*

<sup>135</sup> *Id.*

to be lower than 1.15 times the 720-hour permitted rate (or whatever conversion ratio was used). For example, during a 720-hour period in which River Rouge Unit 3 was not operating for 120 hours, the remaining hours could emit up to 2,760 lb/hr for every remaining hour, and still meet the 720-hour rolling average permit limit of 2,300 lb/hr.<sup>136</sup> Yet in its modeling, MDEQ used an hourly modeled rate for Unit 3, which is supposed to represent the maximum hourly emission rate, of 2,517.3 lb/hr.<sup>137</sup> As such, using only the 720-hour standard, one can easily show that the hourly emission rate can exceed a level that would cause exceedances of the one-hour NAAQS sufficiently often (i.e., more than 3 times per year) to be in non-attainment, despite meeting the requirements of the 720-hour permit.<sup>138</sup>

To truly highlight the fallacy that a 720-hour average could actually ensure compliance with the 1-hour NAAQS, Dr. Gray “modified” the River Rouge Unit 3 hourly emission data by randomly inserting 25 extremely high hourly average emission rates (10,000 lb/hr) throughout the data set.<sup>139</sup> The maximum hourly average emission rate in the original 2014 data was 3,861 lb/hr, and the maximum 720-hour rolling average was 2,361 lb/hr.<sup>140</sup> After inserting the 25 high hourly emission rate values of 10,000 lb/hr, the maximum 720-hour rolling average (2,361 lb/hr) was completely unchanged.<sup>141</sup> In other words, this facility would still demonstrate compliance with the 720-hour emission limit, despite including numerous episodes significantly above the acceptable maximum hourly emission rate.<sup>142</sup>

In order to reduce the inadequacy of a 720-hour limit in achieving attainment with a 1-hour standard, MDEQ must, at a minimum, provide that the permits for River Rouge Unit 3 and Trenton Channel Unit 9 only allow the permittee to include hours when the unit is actually operating and emitting non-zero levels of pollution in calculating the 720-hour average emission rate and demonstrating compliance with the 720-hour average emission limit at each unit.<sup>143</sup> Such an approach would not fully address the ineffectiveness of a 720-hour average permitted emission rate in limiting peak hourly emissions, but it would at least help lower actual emissions to a rate somewhat closer to the hourly rate assumed in MDEQ’s modeling.<sup>144</sup>

## **B. The Submitted NSIP Does Not Provide for Enforceable Limits as Key Elements are Included in Permits and Not the NSIP Itself.**

According to EPA’s guidelines, the NSIP “should provide for attainment of the standard based on SO<sub>2</sub> emission reductions from control measures that are permanent and enforceable.”<sup>145</sup> Yet there is reason to question whether the proposed limits for all of the sources other than U.S. Steel would meet this standard. MDEQ incorporates into the Submitted NSIP permit

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<sup>136</sup> *Id.* at 18-19.

<sup>137</sup> *Id.* at 19.

<sup>138</sup> *Id.*

<sup>139</sup> *Id.* at 20-22.

<sup>140</sup> *Id.* at 20.

<sup>141</sup> *Id.*

<sup>142</sup> *Id.*

<sup>143</sup> *Id.* at 22.

<sup>144</sup> *Id.*

<sup>145</sup> EPA NSIP Guidance at 14.

requirements from Permits to Install for Carmeuse, River Rouge, Trenton Channel, and EES Coke.<sup>146</sup> MDEQ attached these permits as appendices to the Submitted NSIP.<sup>147</sup> These are not permanent permits. In fact, MDEQ noted previously that it plans to void those permits and incorporate their limits into renewable operating permits, which are renewed every five years. MDEQ previously stated that it plans to also include the limits in source-wide Permits to Install, which will “remain[] in effect” unless certain other regulatory provisions are met.<sup>148</sup>

MDEQ’s own internal communications demonstrate uncertainty regarding whether such limits qualify as “permanent” and “enforceable.” In October 2013, for instance, an AQD supervisor wrote his colleague to recommend that “the legally enforceable emission reduction [for Carmeuse Lime] should be in rules rather than a permit,” because “EPA has often stated that permits are not ‘permanent.’”<sup>149</sup>

In another email, an MDEQ employee expressed serious concerns about incorporating limits from permits to install by reference, rather than directly into the rule:

“I would still think – from a programmatic view – we would want to ensure permanency at the State level. We can void a PTI and still have it be part of the SIP, but we can’t enforce the SIP – only EPA can. That leaves open the possibility that only EPA could keep enforcing those sulfur requirements but the State could not.

Also, what happens when the PTI gets voided when it is rolled into the ROP? Theoretically, DTE will get the PTI, then submit an M-001 form, then the PTI will get rolled into the ROP and the PTI will be voided. This process could take as little time as a month or two. So what are we going to do then – submit the voided PTI as part of the SIP package, or submit the new ROP as part of the SIP package? And then what happens when the ROP gets renewed – do we need to resubmit it to EPA for inclusion into the SIP. The more I think about this, the more uncertain I am that going the PTI route works.”<sup>150</sup>

Moreover, communications between MDEQ and DTE indicate that DTE preferred a permit process to a rulemaking precisely because the Permits to Install could provide flexibility in the future. In September 2014, DTE wrote MDEQ to state its preference that “our permit not be referenced in the SIP” because it would “only cause difficulties later if we need to revise our permit.”<sup>151</sup> One month later, DTE wrote again to “reiterate that DTE’s preferred path for the required SO<sub>2</sub> reductions is still through the permit process and not through rule making,” and to

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<sup>146</sup> Submitted NSIP at 42, *see also* Submitted NSIP appendices D, G, H, and I.

<sup>147</sup> *Id.*

<sup>148</sup> Draft NSIP at 44.

<sup>149</sup> MDEQ Emails at 1 (Email from Barb Rosenbaum, Supervisor, Air Quality Evaluation Section, MDEQ Air Quality Division, to Robert Irvine, Env’tl. Manager, Strategy Dev. Unit, MDEQ Air Quality Division, “RE: Carmeuse” (Oct. 30, 2013, 1:44 PM).

<sup>150</sup> *Id.* at 6 (Email from Jeffrey Kornisky to Robert Irvine, “RE: Update on DTE – River Rouge and Trenton Channel”).

<sup>151</sup> *Id.* at 3 (Email from Steve M. Zervas, Supervisor, Env’tl. Affairs, DTE Energy Services, to Robert Irvine, “RE: COG Fuel Sulfur Monitoring” (Sept. 17, 2014, 12:53 PM).

confirm that the “rulemaking process [was] not moving forward until [the parties agreed] on the permits.”<sup>152</sup>

Indeed, bargaining between MDEQ and its regulated entities over their method of compliance with the 1-hour SO<sub>2</sub> NAAQS appears to have extended to all the major sources except for U.S Steel. In November 2014, an internal MDEQ email noted that, “DTE wants the permit revision and not the rule, so we will remove subrule (4) and (5) from the rule before proceeding with the rule into the formal rule process. Carmeuse has also expressed interest in using this approach and will be talking to Permit staff to do so. Coke also wants out of the rule by putting the language in subrule (7) into the permit currently out for public comment.”<sup>153</sup>

MDEQ’s “parallel process” of working with individual companies to set emissions limits<sup>154</sup> is not what the law requires.<sup>155</sup> Instead, the agency has a duty to set emissions at levels necessary to achieve attainment of the standard based on permanent and enforceable measures, not to create a plan that is “acceptable to both parties.”<sup>156</sup>

Finally, it is inappropriate to make permits that are subject to continual modification the source for NSIP limits as it creates logistical problems. MDEQ attached the Permits to Install for four facilities as appendices to the NSIP. MDEQ has stated that it intends to modify these permits in the future with Renewable Operating Permits. There could be elements of the PTI that at some point in time become no longer relevant, more stringent, or less stringent. This would create a tension between a facilities operating permit and an appendix to an NSIP and generate confusion about the appropriate limit. To ensure that the NSIP is permanently enforceable, all emission limits must be clearly articulated in the NSIP itself and not in a temporary permit that the agency acknowledges will become moot.

### **C. EPA Should Disregard MDEQ’s Attempts to Downplay How Bad the Pollution is in Wayne County**

MDEQ also attempts to justify its Submitted Plan’s on the fact that the SWHS monitor “dropped below the standard with the 2014 design value, thereby meeting the 1-hour SO<sub>2</sub> standard.”<sup>157</sup> MDEQ has relied on these results to claim to the media that “real air quality” in the Wayne County non-attainment area “is protective of public health” and that SO<sub>2</sub> pollution concerns reflect nothing more than “theoretical air quality, based on an unrealistic operating scenario.”<sup>158</sup> Such statements ignore the fact that the SWHS monitor measures air quality in only a single discrete location in a non-attainment area that is 40 kilometers long by six

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<sup>152</sup> *Id.* at 4 (Email from Fadi K. Mourad, Director, Env’tl. Strategy and Non Utility, DTE Energy, to Robert Irvine, “RE: documentation for desulf” (Oct. 29, 2014, 11:59 AM)).

<sup>153</sup> *Id.* at 8 (Email from Robert Irvine to Jeffrey Korniski, “RE: Update on DTE - River Rouge and Trenton Channel” (Nov. 3, 2014 11:25 AM)).

<sup>154</sup> Draft NSIP, Appendix F at 19.

<sup>155</sup> *Id.*

<sup>156</sup> *Id.*

<sup>157</sup> Submitted NSIP at 3.

<sup>158</sup> Jim Lynch, *Michigan’s tactics for cutting air pollution under fire*, The Detroit News (Mar. 9, 2015), available at <http://www.detroitnews.com/story/news/local/michigan/2015/03/09/michigans-tactics-cutting-air-pollution-fire/24683209/>.

kilometers wide.<sup>159</sup> In addition, monitors are especially poorly suited to evaluating the air quality impacts of a strongly source-specific pollutant such as SO<sub>2</sub>.<sup>160</sup> Moreover, while the SWHS monitor may have recorded design values below 75 ppb in 2014 and 2015, the SWHS monitor still had exceedances of the NAAQS in those years.<sup>161</sup> Because of the inability of monitors to fully assess the ambient impacts of SO<sub>2</sub> emissions from major pollution sources, EPA has long recognized the importance of using air quality modeling to evaluate whether an area is in attainment with SO<sub>2</sub> air quality standards. As discussed above, such air quality modeling data plainly demonstrates that the Wayne County non-attainment area continues to be impacted by excessive levels of SO<sub>2</sub> pollution.

In promulgating the 2010 1-hour SO<sub>2</sub> NAAQS, EPA strongly endorsed the importance of air quality modeling as the primary tool for assessing whether an area will achieve attainment of the NAAQS. For example, EPA recognized the “strong source-oriented nature of SO<sub>2</sub> ambient impacts,” and concluded that dispersion modeling is “the most technically appropriate, efficient and readily available method for assessing short-term ambient SO<sub>2</sub> concentrations in areas with large point sources.”<sup>162</sup> Similarly, in its White Paper discussing implementation of the NAAQS, EPA stated that using modeling to determine attainment for the SO<sub>2</sub> standard “could better address several potentially problematic issues than would the narrower monitoring-focused approach discussed in the proposal for the SO<sub>2</sub> NAAQS, including the unique source-specific impacts of SO<sub>2</sub> emissions and the special challenges SO<sub>2</sub> emissions have historically presented in terms of monitoring short-term SO<sub>2</sub> levels for comparison with the NAAQS in many situations.”<sup>163</sup>

EPA further confirmed this preference for modeling in its Guidance for 1-Hour SO<sub>2</sub> Nonattainment Area SIP Submissions. There, EPA stated that

The comparison of all receptor design values to the NAAQS is necessary given the short term nature of the SO<sub>2</sub> NAAQS and the fact that SO<sub>2</sub> emissions are primarily from stationary combustion sources with strong local concentration gradients. Given the variability of meteorology (especially wind speed and direction) and the short term nature of the NAAQS, comparison of modeled design values at only one receptor, such as the location of the monitor, would not yield results that provide for informing the most stringent controls to aid the area to demonstrate attainment. Because monitors represent a single location, modeling with a multitude of receptors allows for determining other possible locations of high concentrations given the meteorological variability.<sup>164</sup>

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<sup>159</sup> MI Technical Support Document at 4.

<sup>160</sup> See, e.g., EPA, *Implementation of the 1-Hour SO<sub>2</sub> NAAQS, Draft White Paper for Discussion*, at 3-4 (May 2012) (explaining that modeling to determine attainment for the SO<sub>2</sub> standard “could better address several potentially problematic issues than [a] monitoring-focused approach . . . including the unique source-specific impacts of SO<sub>2</sub> emissions”), attached as Exhibit 6 (hereinafter “EPA Draft White Paper”).

<sup>161</sup> *MDEQ Air Quality Report* at A6; see also Dr. Gray 2015 Report at 7.

<sup>162</sup> 2010 SO<sub>2</sub> NAAQS, 75 Fed. Reg at 35,551. See also *id.* at 35,570 (noting that “it is more appropriate and efficient to principally use modeling to assess compliance for medium to larger sources . . .”).

<sup>163</sup> EPA Draft White Paper at 3-4.

<sup>164</sup> EPA NSIP Guidance at A-7 –A-8.

EPA's focus on modeling in the 1-hour SO<sub>2</sub> NAAQS is fully consistent with the agency's historic use of modeling in determining attainment with earlier SO<sub>2</sub> standards. As the agency has explained:

Historically, we have favored dispersion modeling to support SO<sub>2</sub> NAAQS compliance determinations for areas with sources that have the potential to cause an SO<sub>2</sub> NAAQS violation, and we have explained that for an area to be designated as "attainment," dispersion modeling regarding such sources needs to show the absence of violations even if monitoring does not show a violation. This has been our general position throughout the history of implementation of the SO<sub>2</sub> NAAQS program.<sup>165</sup>

Similarly, in its 1994 SO<sub>2</sub> Guideline Document, EPA noted that "[f]or SO<sub>2</sub> attainment demonstrations, monitoring data alone will generally not be adequate," and that "[a]ttainment determinations for SO<sub>2</sub> will generally not rely on ambient monitoring data alone, but instead will be supported by an acceptable modeling analysis which quantifies that the SIP strategy is sound and that enforceable emission limits are responsible for attainment."<sup>166</sup> As EPA explained, "[f]or SO<sub>2</sub>, dispersion modeling will generally be necessary to evaluate comprehensively a source's impacts and to determine the areas of expected high concentrations based upon current conditions."<sup>167</sup>

Courts have upheld EPA's use of modeling to determine an area's attainment status, such as EPA's reliance on air quality modeling to support its issuance of a Federal Implementation Plan to bring the Billings/Laurel, Montana area into attainment with the SO<sub>2</sub> NAAQS.<sup>168</sup> Further demonstrating the superiority of modeling, the D.C. Circuit has acknowledged the inherent problem of using monitored data for criteria pollutants, namely that "a monitor only measures air quality in its immediate vicinity."<sup>169</sup>

EPA's practice in a number of other contexts also demonstrates that modeling is a technically superior approach for ascertaining impacts on NAAQS, and the history of EPA's preference for modeling to evaluate compliance rather than monitoring. For example, all NO<sub>2</sub>, PM<sub>2.5</sub>, and SO<sub>2</sub> NAAQS and PSD increment compliance verification analyses are performed with air dispersion modeling, such as running AERMOD in a manner consistent with the Guideline on Air Quality Models.

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<sup>165</sup> 2010 SO<sub>2</sub> NAAQS, 75 Fed. Reg at 35,551.

<sup>166</sup> U.S. EPA, 1994 SO<sub>2</sub> Guideline Document, at 2-1, 2-5, *available at* [http://www.epa.gov/ttn/oarpg/t1/memoranda/so2\\_guide\\_092109.pdf](http://www.epa.gov/ttn/oarpg/t1/memoranda/so2_guide_092109.pdf).

<sup>167</sup> *Id.* at 2-3.

<sup>168</sup> *Montana Sulphur & Chemical Co. v. U.S. EPA*, 666 F.3d 1174 (9th Cir. 2012); *see also Sierra Club v. Costle*, 657 F.2d 298, 332 (D.C. Cir. 1981) ("Realistically, computer modeling is a useful and often essential tool for performing the Herculean labors Congress imposed on EPA in the Clean Air Act"); *Republic Steel Corp. v. Costle*, 621 F.2d 797, 805 (6th Cir. 1980) (approving use of modeling to predict future violations and incorporating "worst day" assumptions regarding weather and full-capacity operations of pollutant sources).

<sup>169</sup> *Catawba County v. EPA*, 571 F.3d 20, 30 (D.C. Cir. 2009).

EPA uses modeling because EPA is well aware that modeling produces reliable results and is more accurate than monitoring. For example, John C. Vimont, who was the Region 9 Regional Meteorologist<sup>170</sup> at the time, stated under oath in 1990 that:

EPA does recognize the usefulness of ambient measurements for information on background concentrations, provided reliable monitoring techniques are available. EPA does not recommend, however, that ambient measurements be used as the sole basis of setting emission limitations or determining the ambient concentrations resulting from emissions from an industrial source. These should be based on an appropriate modeling analysis.<sup>171</sup>

Similarly, Roger Brode, is a physical scientist in EPA's Air Quality Modeling Group.<sup>172</sup> He also co-chairs the AMS/EPA Regulatory Model Improvement Committee (AERMIC) and the AERMOD Implementation Workgroup.<sup>173</sup> Mr. Brode, has stated under oath that AERMOD is "readily capable of accurately predicting whether the revised primary SO<sub>2</sub> NAAQS is attained and whether individual sources cause or contribute to a violation of the SO<sub>2</sub> NAAQS."<sup>174</sup> Mr. Brode has explained:

As part of the basis for EPA adopting the AERMOD model as the preferred model for nearfield applications in the *Guideline on Air Quality Models*, Appendix W to 40 CFR Part 51, the performance of the AERMOD model was extensively evaluated based on a total of 17 field study data bases (AERMOD: Latest Features and Evaluation Results. EPA-454/R-03-003. U.S. Environmental Protection Agency, Research Triangle Park (2003), portions of which are attached to this affidavit) ("EPA 2003"). The scope of the model evaluations conducted for AERMOD far exceeds the scope of evaluations conducted on any other model that has been adopted in Appendix W to Part 51. These evaluations demonstrate the overall good performance of the AERMOD model based on technically sound model evaluation procedures, and also illustrate the significant advancement in the science of dispersion modeling represented by the AERMOD model as compared to other models that have been used in the past. In particular, adoption of the AERMOD model has significantly reduced the potential for overestimation of ambient impacts from elevated sources in complex terrain compared to other-models.<sup>175</sup>

U.S. EPA must reject any argument that monitoring results at the SWHS obviate the need for a stronger NSIP when air quality modeling shows ongoing exceedances of the 1-hour SO<sub>2</sub> NAAQS.

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<sup>170</sup> Decl. of John C. Vimont at 11, attached as Exhibit 7.

<sup>171</sup> *Id.* at 11 (emphasis added).

<sup>172</sup> Decl. of Roger W. Brode at 1, attached as Exhibit 8.

<sup>173</sup> *Id.* at 2.

<sup>174</sup> *Id.*

<sup>175</sup> *Id.* at 3-4 (emphasis added).

## V. Conclusion

The Submitted NSIP does not demonstrate attainment of the 1-hour SO<sub>2</sub> NAAQS as required by law, and U.S. EPA should expeditiously deny approval of the Submitted NSIP and issues a compliant federal plan that establishes and implements permanently enforceable measures to bring Wayne County into attainment with the standard. As demonstrated above, that plan must be based on a proper background SO<sub>2</sub> level of at least 15 ppb and establish emission limits that are measured on a 1-hour basis. In the event that U.S. EPA, improperly, fails to establish SO<sub>2</sub> limits measured on a 1-hour basis, the agency must, at a minimum: (1) establish emission limits based on proper adjustment ratios, and (2) ensure that only hours when a generating unit is actually operating and emitting non-zero levels of pollution are used in calculating the 720-hour average emission rate and demonstrating compliance with the 720-hour average emission limit at each unit.

As an alternative to calculating and modeling more stringent emission limits for River Rouge Unit 3 and Trenton Channel Unit 9 than what MDEQ included in the Submitted NSIP, U.S. EPA could instead require that both of those units be retired by the October 4, 2018 deadline for bringing the Wayne County area into attainment. DTE Energy has already announced its intent to retire those units by the end of 2020 and 2023, respectively, though that announcement is not legally binding. By requiring the retirement of both of those units as part of a federal plan, EPA could ensure that attainment would be achieved through permanent and enforceable reductions in SO<sub>2</sub> emissions.

Given the health threat posed by excessive SO<sub>2</sub> pollution, MDEQ's slow and inadequate approach to dealing with this issue, and the fact that attainment is required to be achieved by October 4, 2018, U.S. EPA must move quickly to adopt a plan that would demonstrate attainment throughout the nonattainment area as required by the Clean Air Act.

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