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December 9, 2021

*Via certified mail and e-mail*

Michael Regan, Administrator  
U.S. Environmental Protection Agency  
Office of the Administrator, Mail Code 1101A  
1200 Pennsylvania Avenue NW  
Washington, DC 20460  
[regan.michael@epa.gov](mailto:regan.michael@epa.gov)

RE: Notice of Intent to Sue for Violation of Nondiscretionary Duties to Review and Revise the Emission Factors for Municipal Solid Waste Landfills under Section 130 of the Clean Air Act

Dear Administrator Regan:

The Environmental Integrity Project, Chesapeake Climate Action Network, and Sierra Club (collectively, “Citizen Groups”) write to provide you with notice of our intent to commence a civil action against the U.S. Environmental Protection Agency and you, in your official capacity as Administrator (collectively, “EPA” or “the Agency”), for failing to perform nondiscretionary duties required by the Clean Air Act. 42 U.S.C. § 7604(a)(2).

EPA has failed to review and, if necessary, revise the methods—emission factors—that are used to quantify emissions of volatile organic compounds (“VOCs”), oxides of nitrogen (“NOx”), and carbon monoxide (“CO”) from municipal solid waste (“MSW”) landfills at least every three years. 42 U.S.C. § 7430. EPA has not revised the emission factors for MSW landfills in Chapter 2.4 of the Agency’s “AP-42” compendium of emission factors since 1998—more than twenty years ago—despite acknowledging that the current emission factors are flawed. Several research studies show that these emission factors are inaccurate and tend to underestimate air pollution from MSW landfills. Among other problems, the current emission factors: (1) underestimate emissions of almost all pollutants by about 25 percent; (2) underestimate VOC emissions from a significant number of landfills in the U.S. by approximately 60 percent; and (3) do not address emissions of nitrous oxide, a nitrogen oxide compound that is also a potent greenhouse gas with a global warming potential up to 298 times greater than carbon dioxide.

This letter serves as notice of our intent to file suit against EPA under the Clean Air Act for failure to perform these nondiscretionary duties. The Citizen Groups may commence suit in federal district court any time after sixty days from the postmarked date of this notice. 40 C.F.R. § 54.3.

**I. EPA has not fulfilled its nondiscretionary duty to review and, if needed, revise the emission factors for VOCs, NO<sub>x</sub>, and CO pollution from MSW landfills at least once every three years.**

The Clean Air Act requires the Agency to “review and, if necessary, revise” the emission factors that are used to quantify emissions of VOCs, NO<sub>x</sub>, and CO from sources of these pollutants, including MSW landfills, at least once every three years.<sup>1</sup> In order to complete the required review and thereby fulfill its mandatory duties under the Clean Air Act, EPA must review these emission factors every three years and either (1) make a determination that revision is not appropriate or (2) make a determination that revision is appropriate and revise the emission factors.<sup>2</sup>

EPA has failed to perform these nondiscretionary duties for MSW landfills. The Agency has not revised any of the emission factors for MSW landfills in Chapter 2.4 of the AP-42 compilation of emission factors since 1998 (“1998 Factors”).<sup>3</sup> In 2008, EPA acknowledged the deficiency of the 1998 Factors and proposed updated emission factors for Chapter 2.4 of AP-42 (“2008 Draft Factors”).<sup>4</sup> However, the Agency never finalized the proposed revisions and they remain in draft form.<sup>5</sup> Nor did EPA retract its proposal and make a determination that revision of the 1998 Factors is unnecessary.

According to EPA, “[t]here are currently no draft [AP-42] sections under review” for any sources.<sup>6</sup> Based on the information available to the Citizen Groups, EPA has not completed the required reviews of the VOC, NO<sub>x</sub>, or CO emission factors for MSW landfills for at least three years.

**II. EPA’s mandatory duty to complete a review of the VOCs, NO<sub>x</sub>, and CO emission factors includes a review of emission factors for methane, non-methane organic compounds, nitrous oxide, and the Agency’s Landfill Gas Emissions Model.**

As part of EPA’s mandatory review of the VOCs, NO<sub>x</sub>, and CO emission factors, EPA must review the emission factors for methane, a class of pollutants called “non-methane organic compounds,” and nitrous oxide, which is among the class of nitrogen oxides subject to review under Section 130. EPA must also include a review of the VOCs, NO<sub>x</sub>, and CO emission estimation methods in EPA’s Landfill Gas Emissions Model, commonly referred to as “LandGEM.”

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<sup>1</sup> 42 U.S.C. § 7430.

<sup>2</sup> See, e.g., *Envil. Def. Fund v. Thomas*, 870 F.2d 892, 898–900 (2d Cir. 1989).

<sup>3</sup> See EPA, *AP 42, Fifth Edition, Volume I, Chapter 2: Solid Waste Disposal* (Nov. 1998), available at <https://www.epa.gov/sites/default/files/2020-10/documents/c02s04.pdf> [hereinafter “1998 Factors”].

<sup>4</sup> See EPA, *Draft AP 42, Fifth Edition, Volume I, Chapter 2: Solid Waste Disposal* (Oct. 2008), available at [https://www.epa.gov/sites/default/files/2020-10/documents/d02s04\\_0.pdf](https://www.epa.gov/sites/default/files/2020-10/documents/d02s04_0.pdf) [hereinafter “2008 Draft Factors”].

<sup>5</sup> EPA, Measurement Policy Group, *What is a draft section?* (Sept. 2013), <https://www3.epa.gov/ttn/chief/ap42/whatisadraft.txt>.

<sup>6</sup> EPA, *Air Emissions Factors and Quantification, AP-42: Compilation of Air Emissions Factors* (Aug. 5, 2021), available at <https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors>.

A. Methane and non-methane organic compounds

VOCs and CO emissions estimates are based, in large part, on methane generation estimates under the 1998 Factors. Determining the amount of methane generated by the landfill is the crucial first step to estimate VOCs and CO emissions.<sup>7</sup> In addition, while EPA has not yet established an emission factor for nitrous oxide, any factor that it does develop will likely follow the same approach.

Similarly, non-methane organic compounds (“NMOC”) emissions estimates are used to estimate VOC emissions under the 1998 Factors. NMOC is a category of compounds that includes VOCs, but also includes other organic pollutants that are not as volatile as a VOC.<sup>8</sup> EPA uses the NMOC emission factor to estimate VOC emissions by subtracting pollutants with negligible chemical photoreactivity from the NMOC factor.<sup>9</sup> Thus, any review of the emission factors for VOCs and CO must necessarily include a review of the methods used to quantify methane generation and NMOC.

B. Nitrous oxide

The 1998 Factors contain an emission factor for NO<sub>x</sub> emitted from control devices at landfills, like flares, but do not contain an emission factor for estimating nitrous oxide pollution from landfills. Nitrous oxide is an oxide of nitrogen<sup>10</sup> and falls within the scope of EPA’s review duties under Section 130 of the Clean Air Act. Nitrous oxide is a recognized landfill pollutant<sup>11</sup> and a potent greenhouse gas.<sup>12</sup> As part of its review of the NO<sub>x</sub> emission factors for landfills, EPA must review methods for estimating nitrous oxide emissions from MSW landfills.

C. LandGEM

Landfill operators and state and federal regulators use EPA’s Landfill Gas Emissions Model (“LandGEM”) to estimate landfill pollution for inventorying, permitting, and regulatory compliance. LandGEM incorporates the 1998 Factors and is used to estimate emissions of VOCs,

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<sup>7</sup> 1998 Factors at 1, 5–8, 12.

<sup>8</sup> *Id.* at 2–6.

<sup>9</sup> EPA, *Emission Factor Documentation for AP-42 Section 2.4 Municipal Solid Waste Landfills Revised*, at 4-18, 4-21, App. C (Aug. 1997), available at [https://www.epa.gov/sites/default/files/2020-10/documents/b02s04\\_0.pdf](https://www.epa.gov/sites/default/files/2020-10/documents/b02s04_0.pdf); EPA, *Background Information Document for Updating AP42 Section 2.4 for Estimating Emissions from Municipal Solid Waste Landfills*, at 14–16, App. D (Sept. 2008), available at <https://www.epa.gov/sites/default/files/2020-10/documents/d02s04.pdf>.

<sup>10</sup> EPA, *Technical Bulletin: Nitrogen Oxides (NO<sub>x</sub>), Why and How They are Controlled*, at 1–4 (Nov. 1999), available at <https://www3.epa.gov/ttnca1/cica/files/fnoxdoc.pdf>.

<sup>11</sup> Intergovernmental Panel on Climate Change, *2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories*, Vol. 5, Ch. 3, at 23, Appendix 3A.1 *Information on Nitrous Oxide Emission from Solid Waste Disposal Sites* (2019), available at [https://www.ipccnggip.iges.or.jp/public/2019rf/pdf/5\\_Volume5/19R\\_V5\\_3\\_Ch03\\_SWDS.pdf](https://www.ipccnggip.iges.or.jp/public/2019rf/pdf/5_Volume5/19R_V5_3_Ch03_SWDS.pdf).

<sup>12</sup> EPA, *Greenhouse Gas Emissions, Understanding Global Warming Potentials* (Sept. 9, 2020), available at <https://www.epa.gov/ghgemissions/understanding-global-warming-potentials>.

NO<sub>x</sub>, and CO, along with methane, NMOC, and other landfill pollutants.<sup>13</sup> Accordingly, EPA must review the LandGEM methods for quantifying VOCs, NO<sub>x</sub>, and CO as part of its review under Section 130 of the Clean Air Act.<sup>14</sup>

### **III. The current VOCs, NO<sub>x</sub>, and CO emission factors for MSW landfills are inaccurate and incomplete.**

The 1998 Factors for VOCs, NO<sub>x</sub>, and CO underestimate landfill pollution and should be revised. First, EPA has already acknowledged the need to revise the 1998 Factors because the current factors rely on an inaccurate methane generation equation and outdated information about landfill waste composition. Second, scientific studies using direct monitoring of landfills show the current emission factors undercount landfill emissions. Finally, the current emission factors are incomplete because they do not include a method for estimating emissions of nitrous oxide. As EPA itself acknowledged more than fourteen years ago, the 1998 Factors should be revised to ensure that pollution from landfills is accurately accounted for.

#### **A. EPA's own analyses show that the 1998 Factors rely upon an inaccurate methane generation equation and outdated waste composition information.**

**EPA has already conceded that the methane generation equation in the 1998 Factors underestimates VOCs and CO emissions but did not take action to revise those factors.** As discussed above, the equation used to estimate the total amount of methane generated by a landfill is the foundation for the VOCs and CO emission factors. Among other potential problems,<sup>15</sup> EPA itself has determined that the methane generation equation in the 1998 Factors does not account for the fact that gas collection systems at landfills do not recover all of the gas that is generated.<sup>16</sup> The 2008 Draft Factors include a significant revision to address this issue, adding a constant of 1.3 to the methane generation equation.<sup>17</sup> EPA noted:

This constant is included to compensate for L<sub>0</sub> which is typically determined by the amount of gas collected by [landfill gas] collection systems. The design of these systems will typically result in a gas capture efficiency of only 75%. Therefore, 25% of the gas generated by the landfill is not captured and included in the development of L<sub>0</sub>. The ratio of total gas to captured gas is a ratio of 100/75 or equivalent to 1.3.<sup>18</sup>

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<sup>13</sup> EPA released LandGEM version 3.03 in June 2020. EPA, *Landfill Methane Outreach Program (LMOP), List of Tools Related to Landfill Gas and Waste Management: Other EPA LFG Tools* (July 14, 2021), available at <https://www.epa.gov/lmop/list-tools-related-landfill-gas-and-waste-management>.

<sup>14</sup> See *Kansas v. EPA*, 638 Fed.Appx. 11 (Mem.) (D.C. Cir. 2016) (citing Section 130 when referencing EPA's computer model for estimating motor vehicle emission, the Motor Vehicle Emissions Simulator for 2014).

<sup>15</sup> See, e.g., SCS Engineers, *New and Improved Implementation of the First Order Model for Landfill Gas Generation or Collection* (Mar. 2015), available at [https://scsengineers.com/wp-content/uploads/2015/03/Dillah-Panesar-Gornto-Dieleman\\_New\\_and\\_Improved\\_Implementation\\_of\\_First\\_Order\\_Model\\_for\\_LFG\\_Generation\\_or\\_Collection.pdf](https://scsengineers.com/wp-content/uploads/2015/03/Dillah-Panesar-Gornto-Dieleman_New_and_Improved_Implementation_of_First_Order_Model_for_LFG_Generation_or_Collection.pdf).

<sup>16</sup> 2008 Draft Factors at 5.

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

<sup>18</sup> 2008 Draft Factors at 5. "L<sub>0</sub>" is a variable that represents the potential amount of methane that a given amount of waste will produce and is expressed in units of cubic meters of methane per metric ton of waste.

This means that the 1998 Factors underestimate methane generation by at least 25 percent, which translates directly into a 25 percent underestimate of emissions of methane and other pollutants. Accordingly, VOC and CO emissions are likely underestimated by at least 25 percent using the current emission factors.

**In addition, the 1998 Factors significantly underestimate VOCs because they rely on outdated waste composition information.** EPA has acknowledged that the 1998 Factors' reliance on old waste composition data can result in a 60.7 percent underestimate of VOC emissions when compared with the 2008 Draft Factors. The 1998 Factors are based on data from landfills that received a majority of their waste prior to 1992, when MSW landfills were allowed to accept hazardous waste regulated under Subtitle C of the Resource Conservation and Recovery Act ("RCRA").<sup>19</sup> The 2008 Draft Factors, however, include emission factors for landfills that received all or a majority of their waste after 1992.<sup>20</sup> This distinction is important because landfill operators began to implement changes to meet the requirements of Subtitle D of RCRA around this time, which means the composition of the waste disposed of at MSW landfills changed after 1992.<sup>21</sup> For example, the 1998 Factors provide the following:

- VOCs make up 39 percent of NMOC by weight for MSW landfills that received the majority of their waste before 1992 and do not have a known history of accepting a mix of MSW and hazardous waste.<sup>22</sup>
- VOCs constitute 85 percent of NMOC by weight for MSW landfills that received the majority of their waste before 1992 and *did* accept a mix of MSW and hazardous waste.<sup>23</sup>

In contrast, the 2008 Draft Factors state that VOCs make up 99.7 percent of NMOC for MSW landfills that received most of their waste after 1992.<sup>24</sup> If operators of MSW landfills that received the majority of their waste after 1992 use the default concentrations in the 1998 Factors to estimate VOC emissions, they could underestimate those emissions by approximately 60 percent.

B. Scientific studies show that the 1998 Factors underestimate landfill emissions.

Numerous recent scientific studies involving direct monitoring of landfills and other methods show that the 1998 Factors tend to undercount pollution. These studies conclude that the

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<sup>19</sup> *Id.* at 8, 12; EPA, *Background Information Document for Updating AP-42 Section 2.4 for Estimating Emissions from Municipal Solid Waste Landfills*, at iii, 1, 31 (Sept. 2008), available at <https://www3.epa.gov/ttn/chief/ap42/ch02/draft/db02s04.pdf>.

<sup>20</sup> 2008 Draft Factors at 12.

<sup>21</sup> EPA, *Solid Waste Disposal Facility Criteria*, 56 Fed. Reg. 50,978 (Oct. 9, 1991); EPA, *Background Information Document for Updating AP-42 Section 2.4 for Estimating Emissions from Municipal Solid Waste Landfills*, at 1 (Sept. 2008), available at <https://www3.epa.gov/ttn/chief/ap42/ch02/draft/db02s04.pdf>; see also EPA, *Solid Waste Disposal Facility Criteria*, 56 Fed. Reg. 50,978 (Oct. 9, 1991).

<sup>22</sup> 1998 Factors at 12.

<sup>23</sup> *Id.*

<sup>24</sup> 2008 Draft Factors at 13, 18.

current emission factors for MSW landfills and LandGEM underestimate methane emissions, which indicates that VOC and CO emissions are also likely underestimated.

Direct measurement data, while limited due to infrequent monitoring at landfills,<sup>25</sup> tends to show that actual emissions from landfills are higher than estimates produced using the 1998 Factors or similar methods, like those used in EPA's Greenhouse Gas Reporting Program. For example:

1. Researchers who conducted the California Methane Survey, which relied on aircraft to measure methane emissions, concluded that methane emissions from MSW landfills were the largest point sources of methane in the state and that emissions from these facilities were greatly underestimated using emission factors that closely resemble the 1998 Factors.<sup>26</sup>
2. A study of California landfills used direct measurement to identify sources of emissions at landfills that models have difficulty capturing, including emissions from the active faces of landfills and emissions that result from changes in landfill infrastructure. The researchers concluded that models like LandGEM that apply the 1998 Factors may not account for these emissions.<sup>27</sup>
3. A Baltimore and Washington, DC area study that used aircraft to measure methane emissions demonstrated that emissions from landfills were nearly double the emissions estimates from EPA's Greenhouse Gas Reporting Program, which uses methods that are closely related to the 1998 Factors.<sup>28</sup> Emissions from one of the largest landfills in Maryland were nine times greater than the Greenhouse Gas Reporting Program estimated.<sup>29</sup>
4. Researchers who used aircraft to measure methane emissions from landfills in the San Francisco area concluded that landfills were the most under-reported methane source in the study area and that emissions were likely double the estimates from the Greenhouse Gas Reporting Program.<sup>30</sup>

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<sup>25</sup> *Id.* at 4, 9, 13.

<sup>26</sup> Riley Duran, et al., *California's methane super-emitters*, *Nature*, at 180–84 (Nov. 7, 2019); *see also* California Air Resources Board, *California's 2000–2014 Greenhouse Gas Emission Inventory, Technical Support Document*, 2016 Ed., at 126–33, 135–36 (Sept. 2016), available at [https://www.arb.ca.gov/cc/inventory/doc/methods\\_00-14/ghg\\_inventory\\_00-14\\_technical\\_support\\_document.pdf](https://www.arb.ca.gov/cc/inventory/doc/methods_00-14/ghg_inventory_00-14_technical_support_document.pdf).

<sup>27</sup> Daniel Cusworth, et al., *Using remote sensing to detect, validate, and quantify methane emissions from California solid waste operations*, *Environmental Research Letters*, at 1–2, 4–7, 9 (Apr. 29, 2020), available at <https://iopscience.iop.org/article/10.1088/1748-9326/ab7b99/pdf>.

<sup>28</sup> Xinrong Ren, et al., *Methane Emissions from the Baltimore-Washington Area Based on Airborne Observations: Comparison to Emissions Inventories*, *Journal of Geophysical Research: Atmospheres*, at 8,876 (Aug. 20, 2018).

<sup>29</sup> *Id.* at 8,874–76.

<sup>30</sup> Abhinav Guha, et al., *Assessment of Regional Methane Emissions Inventories through Airborne Quantification in the San Francisco Bay Area*, *Environmental Science and Technology*, at 2, 20 (July 7, 2020), available at <https://authors.library.caltech.edu/104257/1/acs.est.0c01212.pdf>.



Other studies focused specifically on LandGEM, which incorporates the 1998 Factors, have shown that LandGEM can underestimate landfill gas generation by as much as 80 percent.<sup>31</sup> For example:

1. A Canada-based study compared LandGEM to other models used around the world and found that LandGEM was the only one to consistently underestimate methane generation from landfills.<sup>32</sup>
2. Researchers who evaluated 5 to 8 years of annual methane collection data from 114 closed landfills nationwide determined that “MSW landfills are emitting more methane than estimated . . .” using the methods employed by the 1998 Factors, as well as the closely related methods employed by EPA’s Greenhouse Gas Reporting Program.<sup>33</sup>

These studies demonstrate that the current emission factors for MSW landfills should be revised.

C. The 1998 Factors underestimate landfill pollution because the factors do not include a method for estimating nitrous oxide emissions.

While the 1998 Factors include emission factors to estimate nitrogen dioxide emissions from control devices that combust landfill gas,<sup>34</sup> they do not contain an emission factor for estimating emissions of nitrous oxide, a type of NO<sub>x</sub> that is generated in the waste heap and emitted directly from landfills. Nitrous oxide is a potent greenhouse gas that is up to 298 times more effective at warming the globe than carbon dioxide on a per weight basis.<sup>35</sup>

According to the Intergovernmental Panel on Climate Change’s (“IPCC”) *2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories*, “[s]ignificant generation of [nitrous oxide] from [Solid Waste Disposal Sites, which include landfills] was indicated by the IPCC Fourth Assessment Report (2007)” and the anaerobic generation of nitrous oxide is

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<sup>31</sup> Hamid Amini, et al., *Comparison of first-order-decay modeled and actual field measured municipal solid waste landfill methane data*, Waste Management, at 2720–28 (Dec. 2013), available at <https://www.sciencedirect.com/science/article/abs/pii/S0956053X1300353X?via%3Dihub>; Daniel Cusworth, et al., *Using remote sensing to detect, validate, and quantify methane emissions from California solid waste operations*, Environmental Research Letters, at 2 (Apr. 29, 2020), available at <https://iopscience.iop.org/article/10.1088/1748-9326/ab7b99/pdf>.

<sup>32</sup> Shirley Thompson, et al., *Building a better methane generation model: Validating models with methane recovery rates from 35 Canadian landfills*, Waste Management, at 2085–86, 2088–90 (Apr. 2009), available at [https://www.researchgate.net/publication/24241186\\_Building\\_a\\_better\\_methane\\_generation\\_model\\_Validating\\_models\\_with\\_methane\\_recovery\\_rates\\_from\\_35\\_Canadian\\_landfills](https://www.researchgate.net/publication/24241186_Building_a_better_methane_generation_model_Validating_models_with_methane_recovery_rates_from_35_Canadian_landfills).

<sup>33</sup> Pradeep Jain, et al., *Greenhouse gas reporting data improves understanding of regional climate impact on landfill methane production and collection*, PLoS ONE, at 1–3, 10–11 (Feb. 26, 2021), available at <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0246334>.

<sup>34</sup> 1998 Factors at 14–15.

<sup>35</sup> EPA, *Greenhouse Gas Emissions, Understanding Global Warming Potentials* (Sept. 9, 2020), available at <https://www.epa.gov/ghgemissions/understanding-global-warming-potentials>.

“common” in landfills.<sup>36</sup> EPA has also acknowledged that MSW landfills emit nitrous oxide.<sup>37</sup> California tracks nitrous oxide emissions from MSW landfills in its state greenhouse gas inventory.<sup>38</sup> Further, a number of studies show that nitrous oxide is generated and emitted by MSW landfills, including from the active faces of landfills.<sup>39</sup> Thus, the 1998 Factors are incomplete and underestimate landfill pollution.

#### **IV. Citizen Groups Giving Notice.**

As required by 40 C.F.R. § 54.3, the names, addresses, and telephone numbers of the Citizen Groups giving notice are:

Environmental Integrity Project  
1000 Vermont Avenue NW, Suite 1100  
Washington, DC 20005  
(202) 469-3150

Sierra Club  
National Clean Air Team  
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Ryan Maher and Jennifer Duggan are the attorneys representing the Environmental Integrity Project, Chesapeake Climate Action Network, and Sierra Club, with contact information provided in the signature block below.

#### **V. Conclusion**

MSW landfills are significant sources of air pollution in the United States, but the methods that are used to estimate emissions from these facilities are inaccurate and incomplete. EPA is

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<sup>36</sup> Vol. 5, Ch. 3, at 23, Appendix 3A.1 *Information on Nitrous Oxide Emission from Solid Waste Disposal Sites*, [https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/5\\_Volume5/19R\\_V5\\_3\\_Ch03\\_SWDS.pdf](https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/5_Volume5/19R_V5_3_Ch03_SWDS.pdf).

<sup>37</sup> See, e.g., EPA, *Available and Emerging Technologies for Reducing Greenhouse Gas Emissions from Municipal Solid Waste Landfills*, at 21, 26 (June 2011), available at <https://www.epa.gov/sites/default/files/2015-12/documents/landfills.pdf>.

<sup>38</sup> See California Air Resources Board, *Current California GHG Emission Inventory Data* (July 28, 2021), available at <https://ww2.arb.ca.gov/ghg-inventory-data>.

<sup>39</sup> See, e.g., Jean Bogner, et al., *Seasonal greenhouse gas emissions (methane, carbon dioxide, nitrous oxide) from engineered landfills: Daily, intermediate, and final California soil covers*, *Journal of Environmental Quality*, at 1010–20 (2011); Houhu Zhang, et al., *N<sub>2</sub>O emissions at municipal solid waste landfill sites: Effects of CH<sub>4</sub> emissions and cover soil*, *Atmospheric Environment*, at 2623–31 (May 2009), available at [https://www.researchgate.net/publication/223658901\\_N2O\\_emissions\\_at\\_municipal\\_solid\\_waste\\_landfill\\_sites\\_Effects\\_of\\_CH4\\_emissions\\_and\\_cover\\_soil](https://www.researchgate.net/publication/223658901_N2O_emissions_at_municipal_solid_waste_landfill_sites_Effects_of_CH4_emissions_and_cover_soil).

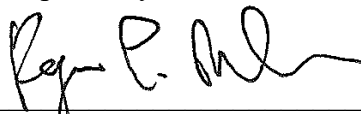


subject to a statutory mandate to complete a review of the emission factors that are used to estimate VOC, NOx, and CO pollution from MSW landfills at least once every three years. For at least the past three years, EPA has failed to complete these reviews and either (1) make a determination that revision of the emission factors is not necessary or (2) make a determination that revision is appropriate and revise the emission factors. The Citizen Groups intend to sue EPA to compel compliance with its mandatory duties to review and revise, as necessary, the VOC, NOx, and CO emission factors for MSW landfills.

If you have any questions regarding the allegations in this notice or would like to discuss resolution of this matter, please contact Ryan Maher using the information provided below.

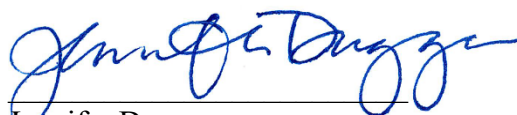
Thank you for your attention to this matter.

Respectfully submitted,



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