

# MEMORANDUM IN RESPONSE TO PETITION FOR RULEMAKING TO ADOPT ULTRA-LOW NO<sub>x</sub> STANDARDS FOR ON-HIGHWAY HEAVY-DUTY TRUCKS AND ENGINES

## I. Introduction

### A. Statutory Provisions

Section 202(a)(1) of the Clean Air Act requires the Administrator of the EPA to regulate air pollutants, including oxides of nitrogen (NO<sub>x</sub>), from any class or classes of new motor vehicles or new motor vehicle engines, which in her or his judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare, and from time to time revise these standards.

Under Section 202(a)(3)(A) of the Act, when EPA establishes emission standards for heavy-duty vehicles and engines these standards are to “reflect the greatest degree of emission reduction achievable through the application of technology which the Administrator determines will be available for the model year to which such standards apply, giving appropriate consideration to cost, energy, and safety factors associated with the application of such technology.” EPA may revise such regulations on the basis of information concerning the effects of emissions from these engines and vehicles and from other sources of mobile source-related pollutants on the public health and welfare, again taking costs into account. Section 202(a)(3)(B) (i). Section 202(a)(3)(C) requires that promulgated standards apply for no less than 3 years and go into effect no less than 4 years after promulgation.

### B. Procedural History

On June 3, 2016, the EPA received a Petition for Rulemaking (“Petition”)<sup>1</sup> from the South Coast Air Quality Management District (SCAQMD) (California), Pima County Dept. of Environmental Quality (Arizona), Bay Area Air Quality Management District (California), Connecticut Dept. of Energy and Environmental Protection, Delaware Dept. of Natural Resources and Environmental Control, Washoe County Health District (Nevada), New Hampshire Dept. of Environmental Services, New York City Dept. of Environmental Protection, Akron Regional Air Quality Management District (Ohio), Washington State Dept. of Ecology, the Puget Sound Clean Air Agency (Washington). (“Petitioners”). The petition requests that EPA take the following actions:

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<sup>1</sup> South Coast Air Quality Management district *et al.* “*Petition to EPA for Rulemaking to Adopt Ultra-Low NO<sub>x</sub> Exhaust Emissions Standards for On-Road Heavy-duty Trucks and Engines.*” June 3, 2016. Petition has been posted on EPA’s Office of Air and Radiation’s petition webpage at <https://www.epa.gov/aboutepa/petitions-office-air-and-radiation> (last accessed November 16, 2016).

- (1) Begin rulemaking to develop an “ultra-low” NO<sub>x</sub> exhaust emissions standard (0.02 g/bhp-hr) for on-road heavy-duty engines with a goal of issuing a notice of proposed rulemaking by July 2017 and a notice of final rulemaking by December 31, 2017;
- (2) Propose that on-road heavy-duty diesel engines meet the 0.02 g/bhp-hr standard for NO<sub>x</sub> by model year (MY)2022 (i.e., by January 1, 2022);
- (3) Develop phase-in requirements for certain classes or categories of heavy-duty vehicles and engines to fully implement the 0.02 g/bhp-hr standard by January 1, 2024, if full implementation of the ultra-low NO<sub>x</sub> standard is not feasible for these classes or categories by January 1, 2022; and
- (4) Develop guidelines under the Diesel Emission Reduction Act (DERA) to allow owners of existing on-road heavy-duty vehicles with engines meeting the 2010 on-road heavy-duty NO<sub>x</sub> exhaust emissions standard of 0.2 g/bhp-hr to qualify for incentive funding to purchase ultra-low NO<sub>x</sub> engines while ensuring that existing 2010 vehicles being turned in under this program do not operate in a nonattainment area.

Petition, at 3.

The following additional organizations have joined the petition: Rhode Island Department of Environmental Management (June 13, 2016), Massachusetts Department of Environmental Protection (June 15, 2016), Coalition for Clean Air (July 7, 2016), Vermont Department of Environmental Conservation (July 11, 2016), San Bernardino Associated Governments (July 18, 2016), New York State Department of Environmental Conservation (July 25, 2016), Sacramento Metropolitan Air Quality Management District (August 23, 2016), and California Air Pollution Control Officers Association (November 7, 2016).<sup>2</sup>

The EPA has also received letters from various state and local organizations and individuals expressing support for the petition including Placer County Air Pollution Control District (June 13), California Council for Environmental and Economic Balance (June 14, 2016), Southern California Gas Company (June 14, 2016), American Lung Association and 8 other health and medical organizations (July 19, 2016), Port of Los Angeles (July 27, 2016), Southern California Edison (August 10, 2016), and the California Air Resources Board (August 12, 2016).

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<sup>2</sup> Letters received from organizations joining the petition have been posted on EPA’s Office of Air and Radiation’s petition webpage at <https://www.epa.gov/aboutepa/petitions-office-air-and-radiation> (last accessed December 14, 2016).

On June 22, 2016, EPA received a separate petition from the San Joaquin Valley Air Pollution Control District (San Joaquin) requesting that the Administrator of EPA undertake rulemakings to reduce NO<sub>x</sub> and PM<sub>2.5</sub> emissions by adopting new national ultra-low NO<sub>x</sub> standards for on-highway heavy-duty trucks and also by developing locomotive regulations for in-use, newly manufactured, and remanufactured locomotives.<sup>3</sup> On December 9, 2016, the EPA received a letter for the California Air Pollution Control Officers Association (CAPCOA), which represents 35 local air pollution control districts and air quality management districts in California, joining this petition. The requests made by San Joaquin with regard to on-highway heavy-duty standards are identical to those made by the SCAQMD et. al. petitioners. When referring to petitioners in this memorandum EPA is also referring to petitioner San Joaquin.

Prior to receiving these petitions, several state and local air quality districts and other organizations had made related requests for new on-highway heavy-duty NO<sub>x</sub> standards to EPA, pointing to the significant contribution of heavy-duty vehicles and engines to NO<sub>x</sub> emissions in their areas, and calling upon EPA to begin a rulemaking to require further NO<sub>x</sub> controls for the heavy-duty sector as soon as possible to help reduce the public's exposure to this air pollution. The California Air Resources Board (CARB) addressed the issue in its comments to the Phase 2 rule controlling greenhouse gas (GHG) emissions and fuel efficiency from heavy-duty vehicles and engines (HD Phase 2 rule) (81 Fed. Reg. 73478 (Oct. 25, 2016)). CARB estimated that heavy-duty on-highway vehicles currently contributed about one-third of all NO<sub>x</sub> emissions in California. In order to achieve the 2008 National Ambient Air Quality Standard for ozone, CARB estimated that the state's South Coast Air Basin would need an 80 percent reduction in NO<sub>x</sub> emissions by 2031.<sup>4</sup> Since those comments were filed, EPA revised the level of the ambient ozone standard from 75 parts per billion (ppb) to 70 ppb to reflect current science about the level that is necessary to protect public health, as required by the Clean Air Act. See 80 Fed. Reg. 65292 (Oct. 26, 2015). EPA received letters and comments as part of the HD Phase 2 rulemaking from the National Association of Clean Air Agencies, the Northeast States for Coordinated Air Use Management, the Ozone Transport Commissions, and the South Coast Air Quality Management District explaining the critical and urgent need to reduce NO<sub>x</sub> emissions that significantly contribute to ozone and fine particulate air quality problems in their respective areas.<sup>5</sup> The American Lung Association,

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<sup>3</sup> San Joaquin Valley Air Pollution Control District; "Petition Requesting that EPA Adopt New National Standards for On-Road Heavy-duty Trucks and Locomotives under Federal Jurisdiction;" June 22, 2016. Petition has been posted on EPA's Office of Air and Radiation's petition webpage at <https://www.epa.gov/aboutepa/petitions-office-air-and-radiation> (last accessed December 14, 2016).

<sup>4</sup> Comment submitted by California Air Resources Board, October 1, 2015, Docket ID: EPA-HQ-OAR-2014-0827-1265.

<sup>5</sup> Comment submitted by National Association of Clean Air Agencies, October 2, 2015, Docket ID: EPA-HQ-OAR-2014-0827-1157; Comment submitted by Northeast States for Coordinated Air Use Management, October 6, 2015, Docket ID: EPA-HQ-OAR-2014-0827-1221; Comment submitted by the Ozone Transport Commission, October 1, 2015, Docket ID: EPA-HQ-OAR-2014-0827-1211; Comment submitted by South Coast Air Quality Management District, October 6, 2015, Docket ID EPA-HQ-OAR-2014-0827-1181.

Environmental Defense Fund, Union of Concerned Scientists, the California Interfaith Power and Light, Coalition for Clean Air/California Cleaner Freight Coalition, and the Moving Forward Network similarly describe the air quality and public health need for NO<sub>x</sub> reductions and requested that EPA lower NO<sub>x</sub> emissions standards for heavy-duty engines.<sup>6</sup>

EPA also received comments during the HD Phase 2 rulemaking concerning NO<sub>x</sub> reductions from the American Trucking Association, Caterpillar, Daimler Trucks North America, Navistar Inc., PACCAR Inc., Volvo Group, Truck and Engine Manufacturers Association, Diesel Technology Forum, National Association of Manufacturers and the National Automobile Dealers Association stressing the need for careful evaluation of emerging NO<sub>x</sub> control technologies and urging EPA to consider the relationship between CO<sub>2</sub> and NO<sub>x</sub> before setting lower NO<sub>x</sub> standards. In addition, EPA received comments pointing to advances in NO<sub>x</sub> emission control technologies that would lower NO<sub>x</sub> without reducing engine efficiency from Advanced Engine Systems Institute, Clean Energy, Manufacturers of Emission Controls Association, and Union of Concerned Scientists. Finally, at the HD Phase 2 public hearing in Los Angeles, both Cummins and Volvo addressed the need for alignment in addressing not only fuel efficiency and CO<sub>2</sub> but also NO<sub>x</sub>. They both expressed interest in working with EPA and CARB to determine the best path forward for achieving real-world NO<sub>x</sub> emission reductions, including standards that reduce emissions of both greenhouse gases (GHGs) and NO<sub>x</sub>.<sup>7</sup>

In the final HD Phase 2 rule, EPA noted the evidence supporting the need for more stringent national NO<sub>x</sub> emissions standards and the widespread interest of stakeholders in a careful evaluation of potential control technologies and test procedures. As part of its technology analysis for the Phase 2 rulemaking, EPA identified cost-effective GHG reducing technologies, such as engine down-speeding and idle reduction technologies that also have the potential to achieve greater NO<sub>x</sub> reductions. These technology examples, along with numerous cost-effective technological advances in exhaust after-treatment technologies, demonstrate that there are feasible approaches where GHG reductions and fuel efficiency do not have to be sacrificed to achieve greater NO<sub>x</sub> reductions. Finally, EPA also indicated its intent to respond to the pending Petition and to engage with a range of stakeholders to discuss opportunities to further reduce NO<sub>x</sub> emissions through more stringent standards for heavy-duty on-highway engines. 81 Fed. Reg. 73522-73524.

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<sup>6</sup> The American Lung Association, October 27, 2015, Docket ID: EPA-HQ-OAR-2014-0827-1421; Environmental Defense Fund, October 1, 2015, Docket ID: EPA-HQ-OAR-2014-0827-1312; Union of Concerned Scientists, October 1, 2015, Docket ID: EPA-HQ-OAR-2014-0827-1329; the California Interfaith Power and Light September 17, 2015, Docket ID: EPA-HQ-OAR-2014-0827-0919; Coalition for Clean Air/California Cleaner Freight Coalition, Public hearing Transcript for Los Angeles, October 27, 2015 pp. 215-218, Docket ID: EPA-HQ-OAR-2014-0827-1420; and the Moving Forward Network, September 29, 2015, Docket ID: EPA-HQ-OAR-2014-0827-1130.

<sup>7</sup> Public Hearing Transcript Los Angeles, California, Environmental Protection Agency and National Highway Traffic Safety Administration National Public Hearing on Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles – Phase 2, August 18, 2015. Docket ID: EPA-HQ-OAR-2014-0827-1420.

## II. Summary of Petitions

Petitioners assert that while ozone levels have decreased by 30 percent since the year 2000, California's South Coast region and San Joaquin Valley remain designated as extreme nonattainment for the 1997 and 2008 8-hour ozone standard. Given the need to attain the NAAQS for fine particulates (PM<sub>2.5</sub>) prior to attainment of the ozone NAAQS, petitioners assert that the most effective way to achieve long-term ozone attainment goals is to maintain an emissions reduction strategy focusing primarily on NOx reductions because NOx is also a precursor to PM<sub>2.5</sub> which itself has been linked to a number of serious adverse health effects including premature mortality. Moreover, the Petitioners state that EPA's revision of the primary and secondary 8-hour national ozone ambient air quality standard (NAAQS) to a more stringent 0.070 parts per million (ppm) level in 2015 is projected to result in additional new nonattainment areas in regions of California and will require further emission reductions in existing nonattainment areas.

Petitioners cite a range of efforts that have already occurred in California to attain the NAAQS, including California's 2008 program to regulate in-use trucks and buses to reduce emissions from the legacy fleet, as well as a set of voluntary low-NOx engine exhaust emission standards at 0.1, 0.05, and 0.02 g/bhp-hr for on-highway heavy-duty engines. These have been adopted in order to encourage engine manufacturers to develop and utilize new technologies to reduce NOx emissions for MY2010 and later. Petitioners also point to expenditures of nearly three billion dollars made by the State of California between 2008 and 2015 to fund the demonstration and deployment of advanced technologies to reduce on-highway heavy-duty truck emissions, including zero-emissions trucks and buses, hybrid-electric medium- and heavy-duty vehicles, and zero-emissions freight equipment.

Petitioners project that further control measures to reduce NOx emissions 50 percent in 2023 and an additional 15 percent by 2031 will be necessary in order for the South Coast region of California to meet the ozone and PM NAAQS by their applicable dates. They cite the 2011 National Emissions Inventory which shows that highway vehicles are the largest source of NOx emissions (at approximately 40-67 percent) in the nation and in major population centers, including cities and surrounding communities.<sup>8</sup> Petitioners further state that in the South Coast Basin alone, 88 percent of regional NOx emissions come from mobile sources, with on-highway heavy-duty diesel trucks comprising the single largest category of NOx emissions sources in 2012. Heavy-duty diesel trucks are projected to remain the largest contributor to the NOx inventory in both 2023 and 2031.

Because the majority of heavy-duty trucks that operate in California are purchased out-of-state and may be operated as part of a nationwide fleet, substantial reductions in NOx

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<sup>8</sup> Petitioners cite EPA's Integrated Science Assessment for Oxides of Nitrogen – Health Criteria, January 2016.

emissions from this national fleet are required if Petitioner SCAQMD is to attain the ozone NAAQS. As a result, Petitioners assert that a nationwide standard would be far more effective than a California-only standard, with relative benefits increasing over time. The South Coast Basin must demonstrate attainment of the 0.75 ppm ozone NAAQS by 2031 (within the next 15 years). Thus, Petitioners believe commencement now of a rulemaking for a new on-highway heavy-duty engine NOx exhaust emissions standard is critical, especially given the time needed for such standards to be adopted, the lead-time necessary for engine manufacturers to produce compliant engines, and the time needed for the combination of new vehicle purchases and old vehicle scrappage to turn the fleet over to the lowest-emitting vehicles.

Petitioners maintain that a nationwide heavy-duty NOx standard would also benefit other regions of the country which currently are working to meet or maintain the existing 2008 ozone NAAQS, as well as the areas across the U.S. that may be designated as nonattainment for the new 2015 ozone NAAQS. For example, Petitioners highlight NESCAUM's<sup>9</sup> comments to the HD Phase 2 proposal, which stated that beyond 2025 additional reductions of NOx emissions from heavy-duty trucks will be critical to attaining the revised ozone NAAQS in the NESCAUM region.

Petitioners also cite hearing testimony by NACAA<sup>10</sup> which recommended that EPA articulate in its HD Phase 2 rule the need for significantly lower national heavy-duty NOx standards beyond the 0.2 g/bhp-hr standards and commit to implementing such a standard. Petitioners also cite other state and local environmental organizations on the need for additional NOx emission reductions.<sup>11</sup> Petitioners Connecticut Department of Energy and Environmental Protection (CT DEEP), New Hampshire Department of Environmental Services, and New York City all provide statements of their specific needs for additional reductions of NOx emissions from heavy-duty trucks.

Petitioners state that a 0.02 g/bhp-hr NOx standard for heavy-duty on-highway engines is technologically feasible and can be implemented by January 1, 2022. Specifically, Petitioners maintain that CARB certification data show that about 8 percent of MY2012 heavy-duty engines already meet (i.e., are certifying at) levels 30 percent lower than the optional 0.1 g/bhp-hr standard; that natural gas engine technology is certified and available

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<sup>9</sup> The Northeast States for Coordinated Air Use Management (NESCAUM) is a regional association of air pollution control agencies in Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont.

<sup>10</sup> NACAA, Testimony before the EPA and National Highway Traffic Safety Administration (NHTSA) on the Proposed Greenhouse Gas and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles - Phase 2 (August 6, and 18 2015) at 1. NACAA Letter to Administrator McCarthy and Rosekind (September 29, 2015). NACAA is a national, non-partisan, non-profit association of air pollution control agencies in 40 states, the District of Columbia, four territories and 116 metropolitan areas.

<sup>11</sup> Petition at 18-19.

today to meet a 0.02 g/bhp-hr standard and is being implemented through the voluntary CARB programs; and that the CARB Draft Technology Assessment (Sept. 2015)<sup>12</sup> demonstrates that heavy-duty diesel engines can meet a NO<sub>x</sub> standard of 0.02 g/bhp-hr. Petitioners also note that EPA has not re-evaluated on-highway heavy-duty NO<sub>x</sub> emissions standards since it adopted the 2007 to 2010 on-highway heavy-duty engine standards over fifteen years ago.

### **III. Summary of Stakeholder Listening Sessions**

In the HD Phase 2 final rule EPA indicated that, before responding to the petition, the Agency would first conduct informal outreach to listen and learn about stakeholders' perspectives on the opportunities for developing more stringent federal standards. EPA met with a range of stakeholders as part of preparing this response, including emissions control technology suppliers; engine and vehicle manufacturers; a labor union that represents heavy-duty engine, parts, and vehicle manufacturing workers; a heavy-duty trucking fleet trade association; an owner-operator driver association; a truck dealers trade association; environmental, non-governmental organizations; states and regional air quality districts; tribal interests; CARB; and the petitioners themselves. These listening sessions were a valuable step for EPA in considering our response to the petitions.

Throughout these listening sessions, certain themes were consistent across a broad range of stakeholders. For example, it became clear that there is broad support for federal action in collaboration with CARB. So called "50-state" standards leverage significant economies of scale for technology suppliers and manufacturers to produce a single set of cost-effective, reliable and nationwide-compliant products. There was broad acknowledgement of the value of aligning new NO<sub>x</sub> standards with milestones for GHG standards under the HD Phase 2 Final Rule, which could both ensure that the GHG and fuel reductions achieved under Phase 2 are maintained, and also allow the regulated industry to consider implementing GHG and NO<sub>x</sub> technologies into the engines and vehicles at the same time.<sup>13</sup> There is also support for additional efforts to accelerate the turnover rate of the current on-highway heavy-duty fleet to post-2010 cleaner engines, since 70 percent of the current fleet still comprises high-emitting pre-2007 engines. Stakeholders highlighted that accelerating the replacement of these pre-2007 engines with today's cleaner engines would achieve significant NO<sub>x</sub> reduction benefits. Stakeholders uniformly recommended that EPA continue the success of past heavy-duty NO<sub>x</sub> reduction programs by working with CARB, industry members, states, and other stakeholders to fashion a program that is both timely and meaningful.

Many stakeholders acknowledged the need for EPA to develop a new NO<sub>x</sub> standard that

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<sup>12</sup> Petition at 24.

<sup>13</sup> Note, the major implementation milestones for the Heavy-duty Phase 2 engine and vehicle standards are in Model Years 2021, 2024, and 2027.

could include additional provisions to assure “real world” emission reductions, not just reductions measured over the existing EPA regulatory test cycles, and urged EPA to spend the time and resources needed to carefully evaluate how best to achieve these reductions. Various stakeholders suggested that EPA should look holistically, and consider the impacts of the emissions certification and in-use compliance test procedures; regulatory test cycles; warranty and regulatory useful life requirements; engine remanufacturing processes; and synergies with existing State heavy-duty emissions inspection and maintenance programs. At the same time, some stakeholders were focused more narrowly on having EPA implement the petitioners’ suggested 0.02 g/bhp-hr NO<sub>x</sub> standard as quickly as possible.

State, local, NGO stakeholders, and petitioners noted that it had been sixteen years since the EPA had reviewed the heavy-duty on-highway NO<sub>x</sub> standards and that it was time for EPA to turn its attention to this effort, especially given the need to reach ozone attainment in many areas and the reality that emissions inventories in many of these areas are largely comprised of mobile source emissions, with heavy-duty engines and trucks making up the vast majority of emissions, in some cases well over 80 percent of the mobile source NO<sub>x</sub> inventory. A number of these stakeholders also pointed to the growth of NO<sub>x</sub> emissions resulting from expanding goods movement, which benefits the entire country but negatively impacts neighborhoods and local communities near ports and rail facilities, creating serious environmental justice issues that can only be addressed through federal action focused on reducing NO<sub>x</sub> emissions from the heavy-duty sector. These same stakeholders also highlighted that health and welfare benefits would be achieved even within regions that are in attainment with ozone standards; especially because of how NO<sub>x</sub> from heavy-duty vehicles contributes to ambient PM<sub>2.5</sub> concentrations, the continued need to reduce regional haze, and continuing eutrophication issues-- especially in the Northeast and New England states. Finally, a number of State Petitioners discussed their respective States’ need to secure timely and meaningful NO<sub>x</sub> reductions from the heavy-duty on-highway sector to meet both the 2008 and 2015 ozone health standards. While clearly stating their preference for a 50-state program, they noted that if EPA failed to develop such a program they would consider opting-in to a future California program under section 177 of the Clean Air Act.

The engine and vehicle manufacturers (the regulated industry) informed EPA that they would support EPA to develop the technical underpinnings of a well-designed program. EPA specifically met with the Truck and Engine Manufacturers Association and some of the association’s member companies (Cummins, Volvo, Navistar, PACCAR, and Daimler Trucks North America) as part of our stakeholder listening sessions. TEMA encouraged EPA to look at approaches which could cost-effectively reduce NO<sub>x</sub> emissions in the real-world, and not to only look at a lower NO<sub>x</sub> standard over the existing regulatory test procedures and engine cycles, some of which have been in place for more than 30 years. EMA noted that a 0.02 g/bhp-hr NO<sub>x</sub> standard is unlikely to be a solution for cost-effective emissions reductions, and EPA should be more holistic and data driven if EPA were to undertake a new rulemaking. The engine and vehicle manufacturers also encouraged EPA to be mindful of the potential impact

of more stringent NO<sub>x</sub> standards on fuel efficiency and GHG emissions. The companies also encouraged EPA to work cooperatively with CARB, in order to maximize the opportunity for a 50-state program for a NO<sub>x</sub> emissions control program.

The United Auto Workers (UAW), whose members work for manufacturers of heavy-duty engines, laid out a number of key principles it requested the Agency follow as it moves forward to reduce NO<sub>x</sub> emissions for on-highway engines and vehicles including paying careful attention to the interplay between any future NO<sub>x</sub> standards and the recently finalized HD Phase 2 standards' implementation schedule, and the importance of a robust, data-driven economic and costs analysis in developing new standards. They also stressed the importance of crafting a 50 state program.

The Owner-Operator Independent Drivers Association (OOIDA) noted that their members often drive hundreds to thousands of miles from their home base and they rely upon their trucks for their livelihood. OOIDA requested that if EPA decides to develop new NO<sub>x</sub> standards the Agency should consider the following: potential new EPA emissions standards should not require the adoption of technologies that are not reliable; EPA should engage with owner-operators in developing any new standards and EPA should evaluate all of the costs and the benefits of new standards; EPA should consider all available data when determining the level of a new standard and EPA should perform an independent assessment of the feasibility of any new standard; EPA should consider the impact of any new NO<sub>x</sub> standard on fuel efficiency which is a key consideration for their members. Furthermore, OOIDA indicated that they would not want to see a state-by-state or regional approach of different emission standards; rather, they would prefer to see a 50-state program.

While EPA met separately with American Trucking Associations (ATA) and the North American Dealers Association (NADA), both associations provided similar feedback. Both associations noted that they generally had a positive experience working with EPA in support of the HD Phase 2 standards; and therefore, supported working closely with EPA to assist in the development of any new heavy-duty engine NO<sub>x</sub> standards. Consistent with ATA's comments submitted in response to the HD Phase 2 proposal, ATA and NADA stressed that any new engine or vehicle technologies required to meet future NO<sub>x</sub> standards should first be proven to be reliable and durable through in-use testing. Both also highlighted that if new vehicles are deemed to be costlier to purchase, operate, maintain or repair, then new vehicle sales would tend to decrease, which would delay the emissions reductions the new standards were intended to achieve.

The Manufacturers of Emissions Controls Association (MECA) supported working with EPA and CARB on the development of an ultra-low NO<sub>x</sub> program for heavy-duty engines and vehicles. MECA noted the technological feasibility of the 0.02 g/bhp-hr standard that the

Petitioners requested by citing engines already certified for sale in California. They identified several certified natural gas-fueled engines for certain heavy duty vehicle applications that are available today that meet this ultra-low level. They also noted that for other heavy-duty vehicle applications, ongoing CARB- and MECA-supported research at Southwest Research Institute has been demonstrating that diesel engine technologies can achieve the same levels, under laboratory conditions. MECA acknowledged that any new technologies must not only achieve significant reductions under laboratory test conditions, but also achieve these reductions during real-world in-use driving.

EPA also met with organizations representing state and local environmental and air quality agency leaders, including the Environmental Council of States (ECOS), the Association of Air Pollution Control Agencies (AAPCA), the National Association of Clean Air Agencies (NACAA) and Northeast States for Coordinated Air Use Management (NESCAUM). Both NESCAUM and NACAA indicated that they had previously submitted comments as part of the HD Phase 2 rule urging the EPA to work collaboratively with CARB to develop new more stringent standards to reduce NO<sub>x</sub> emissions from heavy-duty engines and vehicles. NACAA indicated that the decision to support strong action was not a controversial decision for their members and they all recognized they did not have the tools at the state level to address NO<sub>x</sub> emissions from the heavy-duty sector. Both ECOS and AAPCA indicated that their organizations had not taken a position on a potential rulemaking for new heavy-duty NO<sub>x</sub> standards but that they wanted to learn more about the issues and to engage in the public process if the EPA moves forward to begin a rulemaking. Finally, EPA met with the National Tribal Air Association (NTAA) to learn of their interests and concerns regarding NO<sub>x</sub> emissions from heavy-duty engines and vehicles. NTAA members expressed their interest in early engagement on this issue.

#### **IV. Response**

##### **A. Request that EPA Commence Rulemaking for On-Highway Heavy-Duty Engine Exhaust Emissions Standard for NO<sub>x</sub>**

The EPA has authority under section 202 of the Clean Air Act to establish, and from time to time revise, emissions standards for certain air pollutants emitted from heavy-duty on-highway engines and vehicles to, “reflect the greatest degree of emission reduction achievable through the application of technology which the Administrator determines will be available for the model year to which such standards apply, giving appropriate consideration to cost, energy, and safety factors associated with the application of such technology.”<sup>14</sup> EPA may revise

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<sup>14</sup> The CAA defines on-highway heavy-duty vehicles as those vehicles with a gross-vehicle weight rating (GVWR) above 6,000 lbs. EPA regulations treat vehicles up to 8,500 lbs as light-duty passenger cars and light-duty trucks, and those above as heavy-duty vehicles. The petitioners did not specifically define for which categories of heavy-

heavy-duty regulations on the basis of information concerning the effects of emissions from these engines and vehicles and from other sources of mobile source-related pollutants on the public health and welfare, again taking costs and other factors into consideration.

The emission standards that EPA has developed for heavy-duty on-highway engines have become progressively more stringent over the past 40 years, with the most recent NOx standards finalized in 2001 for new heavy-duty on-highway engines fully phased in with the 2010 model year. NOx emissions standards for these engines have contributed significantly to the overall reduction in the national NOx emissions inventory, and they have provided significant benefits in the improvement of human health, welfare, and protection of the environment. Each of these standards have been adopted after extensive technical and cost feasibility analyses, industry and stakeholder input, and consideration of any associated energy and safety factors.

Nevertheless, EPA acknowledges a need for additional NOx reductions from this category of vehicles and engines, particularly in areas of the country with elevated levels of air pollution. EPA believes that opportunity exists to develop, in close coordination with CARB and other stakeholders, a new, harmonized and comprehensive national NOx reduction strategy for heavy-duty on-highway engines. Therefore, EPA intends to initiate a rulemaking to propose revisions to the federal on-highway heavy-duty NOx emissions control program. EPA also intends to work closely with CARB to consider the development of a new harmonized Federal and California program to reduce NOx emissions from heavy-duty on-highway engines and vehicles. In addition, EPA plans to work with truck and engine manufacturers, suppliers, state/local/tribal air quality agencies, NGOs, labor, the trucking industry, and the Petitioners as we move forward on this rulemaking. Based on a preliminary assessment of the scope of work and resources needed to gather data and stakeholder input to develop a proposal, EPA estimates that it will take on the order of 24 months to complete this technical work and prepare a notice of proposed rulemaking for a new on-highway heavy-duty NOx program. Such a schedule would provide enough time for EPA to develop a data-driven proposal, and also preserve the opportunity for EPA in a future final action to consider new standards that would be in effect beginning in the 2024 model year. New model year 2024 standards would coincide with both the latest timing stated in the petitions and also an important model year for the implementation of the heavy-duty Phase 2 standards.

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duty vehicles and engines they requested EPA establish new NOx standards; rather, they requested that new heavy-duty engines which are currently subject to a 0.2 g/bhp-hr standard should be subject to a new, lower NOx emission standard. EPA notes that in the Tier 3 vehicle rule finalized in 2014, EPA established new emissions standards for NOx and other air pollutants for both light-duty and heavy-duty new motor vehicles below 14,000 lbs GVWR. These vehicles will not be subject to a 0.2 g/bhp-hr standard when the Tier 3 standards are implemented, between MY2017 and MY2022. The Tier 3 program is aligned with CARB's LEV III program for all vehicles below 14,000 lbs. EPA does not interpret the petitioners' request for new heavy-duty emission standards to apply to those heavy-duty vehicles already subject to the Tier 3 vehicle emission standards.

## **1. EPA Has Legal Authority to Consider Whether to Revise NO<sub>x</sub> Standards for On-Highway Heavy-Duty Engines and Vehicles**

EPA's authority to adopt and revise standards for NO<sub>x</sub> emissions from heavy-duty vehicles and engines is clear. See section I.A. above.

## **2. EPA's History of Reducing Emissions from The On-Highway Heavy-Duty Sector.**

Since the 1970's, EPA has adopted emissions standards for heavy-duty vehicles and engines, beginning with smoke controls, and focusing in the 1990's on increasingly stringent NO<sub>x</sub>, hydrocarbon, and particulate matter standards. In 1997 EPA finalized standards for heavy-duty highway diesels (62 FR 54693, October 21, 1997), effective with the 2004 model year, which incorporated a combined non-methane hydrocarbon (NMHC) and NO<sub>x</sub> standard and represented a reduction of NO<sub>x</sub> emissions by 50 percent. These reductions in NO<sub>x</sub> also resulted in significant reductions in secondary nitrate particulate matter (PM). This rule also contained provisions increasing the durability of emissions control devices.

In late 2000, EPA finalized a new and comprehensive rulemaking known as the 2007 Heavy-Duty Engine and Vehicle Rule to continue addressing on-highway heavy-duty engines NO<sub>x</sub> and PM emissions (66 FR 5002, January 18, 2001). This rule established a comprehensive national program that regulated the heavy-duty engine and its fuel as a single system with emission standards, taking effect beginning with model year 2007 and fully phasing in by model year 2010. These standards were based on the use of high-efficiency catalytic exhaust emissions control devices or comparably effective advanced technologies. To insure proper functioning of these technologies, which could be damaged by sulfur, EPA also mandated reducing the level of sulfur in highway diesel fuel by 97 percent by mid-2006. These actions resulted in engines that emit PM and NO<sub>x</sub> emissions at levels 90 percent and 95 percent below emissions from then current on-highway diesel engines respectively. The PM standard for on-highway diesels was set at 0.01 grams per brake-horsepower-hour (g/bhp-hr) by 2007 model year and the NO<sub>x</sub> and NMHC standards of 0.20 g/bhp-hr and 0.14 g/bhp-hr, respectively, was set to phase in between 2007 and 2010. In finalizing this rule, EPA estimated that these emission reductions would achieve significant health and environmental impacts and total monetized benefits of the program would exceed \$70 billion versus program costs of \$4 billion (\$1999).

While the MY2007 diesel engine standards addressed emissions from new diesel engines, EPA realized the need to also address emissions from the legacy diesel fleet. Diesel engines can operate for 30 years or more and reducing exposure to diesel exhaust from these engines was

especially important for human health and the environment.<sup>15</sup> EPA created the National Clean Diesel Program (NCDP) in 2006, a partnership with states, regions, and tribal governments to reduce diesel emissions from both existing on-highway and nonroad diesel engines throughout the United States. The 2005 Diesel Emissions Reduction Act, which was part of the 2005 Energy Policy Act, gave EPA new grant and loan authority for promoting diesel emissions reductions from the legacy fleet and authorized appropriations to the Agency of up to \$200 million per year for fiscal year 2007 through fiscal year 2011. Congress appropriated funds for the first time under this program in fiscal year 2008. The American Recovery and Reinvestment Act of 2009 (ARRA) provided \$300 million in new funding for national and state programs to implement verified and certified diesel emissions reduction technologies.<sup>16</sup> This funding allowed the NCDP program to implement many additional projects and accompanying emission reductions.

Beginning in 2009—under the authorities and requirements of the Clean Air Act and the Energy Independence and Security Act—and at the urging of the Engine Manufacturers Association, among others—EPA and DOT’s National Highway Traffic Safety Administration (NHTSA) began working on a joint regulatory program to reduce greenhouse gas emissions (GHGs) and fuel consumption from heavy-duty vehicles and engines.<sup>17</sup> By leveraging regulatory approaches recommended by the National Academy of Sciences, the first phase (“Phase 1”) of the GHG and fuel efficiency program was finalized in 2011 by EPA and NHTSA.<sup>18,19</sup> EPA and NHTSA developed the Phase 1 program through a comprehensive stakeholder engagement process which included truck and engine manufacturers, trucking fleets, environmental organizations, and States—including the State of California. The Phase 1 program, spanning implementation from model years 2014 to 2018, included separate standards for both on-highway heavy-duty vehicles and engines. The program offered flexibility allowing manufacturers to attain these standards through a mix of technologies, and the use of various emissions credit averaging and banking programs.

EPA and DOT’s NHTSA recently finalized the Heavy-Duty Phase 2 GHG and fuel efficiency program, which was also developed with extensive stakeholder engagement. Phase 2 includes technology-advancing performance-based standards that will phase in over the long-term, with initial standards for most vehicles and engines commencing in MY2021, increasing

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<sup>15</sup> 81 Fed. Reg. 73478, 73840-73841. (October 25, 2016)

<sup>16</sup> The Energy Policy Act of 2005, Pub.L.109-58, 119 Stat.599; American Recovery and Reinvestment Act of 2009, Pub.L. 111-5, 123 Stat. 115, section.

<sup>17</sup> Letter from Jed R. Mandel, President of the Engine Manufacturers Association to Robert Sussman, Obama-Biden Transition Team RE: Greenhouse Gas Reductions from Heavy-Duty Commercial Vehicles. (December 23, 2008).

<sup>18</sup> 76 Fed. Reg. 57106 (September 15, 2011).

<sup>19</sup> The National Academies’ Committee to Assess Fuel Economy Technologies for Medium- and Heavy-Duty Vehicles; National Research Council; Transportation Research Board. “Technologies and Approaches to Reducing the Fuel Consumption of Medium- and Heavy-Duty Vehicles.” 2010.

in stringency in MY2024, and culminating in MY2027 standards.<sup>20</sup> Phase 2 builds on and advances the Phase 1 program in a number of important ways, including basing standards not only on currently available technologies but also on utilization of technologies now under development or not yet widely deployed. To ensure adequate time for technology development, Phase 2 provides up to 10 years lead time to test and gradually phase in these controls; further encouraging innovation and providing transitional flexibility. While both the Phase 1 and 2 standards have focused on reducing GHG emissions and improving the fuel efficiency of the heavy-duty sector, these programs also are projected to result in modest but important reductions of non-GHG criteria pollutants such as NO<sub>x</sub>, VOC, PM<sub>2.5</sub> and air toxics.<sup>21</sup>

### **3. On-Highway Heavy-Duty Vehicles and Engines Continue to Contribute to Serious Air Pollution Problems in The U.S.**

NO<sub>x</sub> is one of the major precursors of tropospheric ozone (ozone), exposure to which is associated with a number of adverse respiratory and cardiovascular effects.<sup>22</sup> These effects are particularly pronounced among children, the elderly, and among people with lung disease such as asthma. NO<sub>x</sub> is also a major contributor to secondary PM<sub>2.5</sub> formation and exposure to PM<sub>2.5</sub> itself has been linked to a number of adverse health effects,<sup>23</sup> such as heart attacks and premature mortality. In addition, NO<sub>2</sub> formed by NO<sub>x</sub> emissions can aggravate respiratory diseases, particularly asthma, and may also contribute to asthma development in children.<sup>24</sup>

EPA has already adopted many emission control programs that are expected to reduce ambient ozone levels. However, the U.S. Energy Information Administration's 2016 Annual Energy Outlook predicts that vehicle miles travelled (VMT) for heavy-duty trucks will increase in the coming years, and even with the implementation of all current state and federal regulations, some of the most populous counties in the United States are expected to have ozone concentrations that exceed the ozone NAAQS well into the future. As of September 22, 2016 there were 43 ozone nonattainment areas for the 2008 NAAQS; composed of 211 full or partial counties, with a population of almost 120 million.<sup>25</sup> These nonattainment areas are dispersed across the country, with counties in the west, northeastern United States, Texas, and several

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<sup>20</sup> 81 Fed. Reg. 73478 (October 25, 2016).

<sup>21</sup> 81 Fed. Reg. 73478, 73836-73857.

<sup>22</sup> U.S. EPA. Integrated Science Assessment (ISA) of Ozone and Related Photochemical Oxidants (Final Report). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-10/076F, 2013. The ISA is available at <http://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=247492#Download>. (Last Accessed December 14, 2016).

<sup>23</sup> U.S. EPA. (2009). Integrated Science Assessment for Particulate Matter (Final Report). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-08/139F, 2009. The ISA is available at <https://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=216546>. (Last Accessed December 14, 2016).

<sup>24</sup> U.S. EPA. Integrated Science Assessment for Oxides of Nitrogen—Health Criteria (2016 Final Report). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-15/068, 2016. The ISA is available at <https://www.epa.gov/isa/integrated-science-assessment-isa-nitrogen-dioxide-health-criteria>. (Last Accessed December 14, 2016).

<sup>25</sup> U.S. EPA Green Book. This document may be accessed at <https://www.epa.gov/green-book>. (Last Accessed December 14, 2016).

Great Lakes states. In California, the San Joaquin Valley and the South Coast Air Basin are highly-populated areas classified as “extreme nonattainment” for the 2008 8-hour ozone standard, with an attainment demonstration deadline of 2031 (one year in advance of the actual 2032 attainment date). As noted above, EPA has recently revised the primary and secondary ozone NAAQS to make the level of the standard more protective (and retaining all other elements of the standard unchanged).

EPA plans to finalize nonattainment designations for the 2015 ozone NAAQS in October 2017. Further NO<sub>x</sub> reductions would provide reductions in ambient ozone levels, helping to prevent adverse health impacts associated with ozone exposure and assisting states and local areas in attaining and maintaining the applicable ozone NAAQS. Reductions in NO<sub>x</sub> emissions would also improve air quality and provide public health and welfare benefits throughout the country by 1) reducing PM formed by reactions of NO<sub>x</sub> in the atmosphere; 2) reducing concentrations of NO<sub>2</sub>; 3) reducing nitrogen deposition to sensitive environments; and 4) improving visibility.

#### **4. EPA’s Timeframe for Setting Lower NO<sub>x</sub> Emission Standards for Heavy-Duty On-Highway Engines**

Petitioners discussed a number of reasons why they believe there is an urgent need for EPA action to expeditiously reduce NO<sub>x</sub> emissions from on-highway engines. They point out that EPA has not revised its NO<sub>x</sub> standards for on highway heavy-duty vehicles in sixteen years, even as enhanced technologies have been developed that could further reduce such emissions. They note that heavy-duty trucks represent the single largest source of NO<sub>x</sub> in the South Coast Basin currently, and will continue to do so in 2023 and 2031, which is the timeframe for the region’s required attainment demonstrations for the 1997 and 2008 8-hour ozone standards.<sup>26</sup> In addition, petitioners indicate that NO<sub>x</sub> emissions, one of the major precursors of tropospheric ozone, will continue to increase into the future due to the continued expected increase in heavy-duty truck activity. Further, even though the State of California is committed to pursuing rules that will reduce NO<sub>x</sub> emissions from heavy-duty trucks within California, a nationwide standard would be far more effective than a California-only standard, since the majority of heavy-duty trucks that operate in California are purchased out-of-state and may be operated as part of nationwide fleet<sup>27</sup>--and would not be required to adhere to California standards. Finally, petitioners state that a new heavy-duty NO<sub>x</sub> standard would also benefit other regions beyond California’s South Coast in attaining the new 2015 ozone standard and will help prevent further progression of marine eutrophication, visibility impairment, and acid deposition.

There continues to be additional work needed to attain and maintain the ozone NAAQS. EPA believes that reducing NO<sub>x</sub> emissions from on-highway heavy-duty trucks is an important

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<sup>26</sup> Petition at pages 6, 33.

<sup>27</sup> Petition at page 14.

component of improving air quality nationwide and reducing public health effects associated with exposure to ozone and secondary PM<sub>2.5</sub>, especially for vulnerable populations and in highly impacted regions. Together the arguments and data presented by petitioners create a compelling case for federal action and support the need for more stringent nationwide NO<sub>x</sub> emissions standards for on-highway heavy-duty vehicles. The comments EPA has received during the Phase 2 rulemaking and in support of the Petitions likewise support the need for further action. In addition, the listening sessions conducted by EPA in advance of this response further confirm the need and support for federal action.

EPA intends to work with CARB to initiate the development of a new harmonized Federal and California comprehensive NO<sub>x</sub> reduction program for heavy-duty on-highway engines, including lower NO<sub>x</sub> emission standards for heavy-duty on-highway engines and vehicles. As noted above, EPA plans to work with truck and engine manufacturers, suppliers, state/local/tribal air quality agencies, NGOs, labor, the trucking industry, and the Petitioners as we move forward on this rulemaking. Based on a preliminary assessment of the scope of work and resources needed to gather data and stakeholder input to develop a proposal, which among other things includes a full cost-benefit analysis, EPA estimates that it will take on the order of 24 months to complete this technical work and prepare a notice of proposed rulemaking for a new on-highway heavy-duty NO<sub>x</sub> program. This would provide enough lead time to consider new mandatory standards starting in the 2024 model year. Model year 2024 standards would coincide with both the latest timing stated in the petition and an important model year for the implementation of HD Phase 2 standards. Although the petitioners requested that EPA take action sooner than this timeframe, EPA believes that in order to develop a comprehensive and effective proposal for a new NO<sub>x</sub> emission reduction program that properly assesses real-world costs and benefits more time is needed to gather and analyze the data. A more rapid timeframe would limit the inquiry to standards based on current regulatory test procedures and test cycles. EPA believes a more robust assessment and regulatory development process will lead to more real-world emission reductions.

**B. Request That Proposed Rule Require Ultra-Low NO<sub>x</sub> Engines Meet A 0.02 G/Bhp-Hr Standard Over the Federal Test Procedure (I.E., The Composite FTP Transient Test)**

The Petitioners describe existing and under development low NO<sub>x</sub> technologies which they believe can reduce NO<sub>x</sub> emissions as well as several potential approaches EPA could consider to reduce NO<sub>x</sub> emissions from the on-highway heavy-duty sector. EPA has not recently performed a comprehensive assessment of the effectiveness and costs of new NO<sub>x</sub> emission control technology for heavy-duty engines and vehicles, but we are aware of work that has been published in the literature that speaks to the potential for additional NO<sub>x</sub> reductions that can be achieved as a result of technology developments that have occurred over the past

decade. However, EPA also believes that in order to achieve cost-effective real-world reductions, we must look beyond simply reducing the NO<sub>x</sub> standard over the test procedures and test cycles that we currently require. Therefore, it should not be presumed that EPA would eventually propose a NO<sub>x</sub> standard of 0.02 g/bhp-hr.

Nevertheless, EPA believes that an opportunity exists to develop over the next several years, in close coordination with CARB and other stakeholders, a new, harmonized comprehensive national NO<sub>x</sub> reduction strategy for heavy-duty on-highway engines. Such a strategy could include the following:

- Lower NO<sub>x</sub> emission standards
- Improvements to test procedures and test cycles to ensure emission reductions occur in the real world, not only over the applicable certification test cycles
- Updated certification and in-use testing protocols
- Lengthening the period of our mandatory emissions-related component warranties
- Consideration of longer regulatory useful life, reflecting actual in-use activity
- Consideration of rebuilding/remanufacturing practices that perpetuate the use of high emitting engines
- Incentives to encourage the transition to current- and next-generation cleaner technologies as soon as possible

At this time EPA believes it is premature to commit to a particular level or form of a future low NO<sub>x</sub> standard for heavy-duty engines or vehicles, especially in advance of developing the robust technical record necessary to propose and promulgate such standards. However, as noted above, EPA agrees that technical progress has been made in developing technologies and approaches that can reduce NO<sub>x</sub> emission beyond the standards put in place in the 2000 rule. EPA also agrees with Petitioners that based on technology assessments in the recently finalized HD Phase 2 rule and the conclusions of the recently released CARB study<sup>28</sup> it is clear that further progress can be made in reducing NO<sub>x</sub> emissions from the on-highway heavy-duty sector and that there exist cost-effective technologies, such as engine down-speeding, idle reduction technologies, and numerous advances in exhaust after-treatment

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<sup>28</sup>State of California Air Resources Board, Draft Technology Assessment: Lower NO<sub>x</sub> Heavy-Duty Diesel Engines, September 2015. This report is available at [https://www.arb.ca.gov/msprog/tech/techreport/diesel\\_tech\\_report.pdf](https://www.arb.ca.gov/msprog/tech/techreport/diesel_tech_report.pdf). Last Accessed December 13, 2016.

technologies that demonstrate where GHG reductions and fuel efficiency do not have to be sacrificed to achieve greater NOx reductions.

Therefore, EPA will carefully evaluate the scientific and other information relevant to determining the appropriate level and form of a future low NOx standard for on-highway heavy-duty vehicles and engines, and the agency will continue to engage with a wide range of stakeholders to gather the best data to inform our proposal development.

The major steps that EPA will take under Clean Air Act section 202(a)(3) include: (1) evaluating the scientific and other information relevant to lowering heavy-duty on-highway NOx emissions; (2) preparing a proposed notice of rulemaking; (3) conducting intra- and inter-agency review of the draft proposed rule; (4) publishing the proposal and providing the public with notice and an opportunity to comment on the proposal; (5) reviewing, analyzing and responding to those comments and preparing the appropriate final rule and supporting documents; and (6) conducting final intra- and interagency review before issuing a final rule.

### **C. Request That EPA Develop a Phase-In Program for Certain Classes or Vocations of On-Highway Heavy-Duty Vehicles.**

Petitioners acknowledge that new NOx engine standards may need to be phased-in over time to address the various requirements and limitations associated with certain classes or categories of vehicles. While it is premature to consider particular phase-in schedules that could maximize cost-effective NOx reductions, EPA has developed phase-in schedules in the past and anticipates that it would give full consideration to such an approach as the Agency works on the development of a new low NOx HD engine and vehicle program.

### **D. Request That EPA Develop Guidelines Under the Diesel Emissions Reduction Act (DERA) To Encourage Early Development and Deployment of 0.02 G/Bhp-Hr Engines to Allow Owners of Existing On-Highway Heavy-Duty Vehicles with Engines Meeting The 2010 On-Highway NOx Standard of 0.2 G/Bhp-Hr to Qualify for Incentive Funding to Purchase Ultra-Low NOx engines.**

EPA estimates that the approximately eleven million older diesel engines already in use throughout the U.S. continue to emit large amounts of NOx (and PM<sub>2.5</sub>) contributing to serious public health and air quality problems. The Diesel Emissions Reduction Act (DERA) authorizes EPA to offer grants and rebates for projects that reduce the impacts of these existing diesel engines by providing funding assistance to eligible entities on a competitive basis to either retrofit or replace engines or vehicles with newer cleaner engines and/or vehicles. At the same time, EPA requires that these be verified technologies with proven reductions as determined by EPA or CARB's technology verification program.

The DERA program also places a priority on projects located in areas that have the highest emissions from diesel engines, including on-highway heavy-duty vehicles and engines. A large number of Petitioner organizations are in counties which received priority for the 2016 DERA program due to poor air quality. Priority areas for the 2016 Request for Proposal (RFP) included counties and areas designated as PM<sub>2.5</sub> or 8-hour ozone nonattainment or maintenance areas in EPA's Green Book of Nonattainment areas for criteria pollutants (<https://www.epa.gov/green-book>).

The DERA Program funding began in fiscal year (FY) 2008, and since then EPA has awarded funds to over 650 projects to reduce diesel emissions nationwide through an annual Request for Proposal (RFP) process. In 2016, EPA awarded \$50 million for clean diesel projects under State, National, and Tribal grant programs, and a school bus rebate program. The 2017 RFP is tentatively scheduled to open in February 2017, and EPA is hopeful that a similar amount of funding will be available for the next grant-making cycle.

EPA currently does prioritize the use of DERA funds to retrofit or replace engines or vehicles with certain model year engines or vehicles that have been certified by CARB to meet California's optional low-NOx standards of 0.1 g/bhp-hr, 0.05 g/bhp-hr, or 0.02 g/bhp-hr. In the 2016 RFP, along with other eligible activities, EPA highlighted the availability of funds to either "repower engines" or "replace vehicles" from Class 5-8 on-highway heavy-duty model year 1994-2006 vehicles and engines<sup>29</sup> with engines or vehicles that meet California's optional low NOx standards. Eligible entities could submit proposals to receive 50 percent of the cost of repowering with a 2015 model year or newer engine certified to CARB's optional low-NOx standards, including the cost of installations. The RFP also indicated that it would pay up to 35 percent of the costs of a replacement vehicle powered by a 2015 model year or newer engine (diesel or alternative fuel) certified to CARB's optional low-NOx standards (vs. 25 percent for a standard 2015 model year heavy-duty engine).

Under the 2016 RFP, model year 2007-2010 on-highway heavy-duty vehicles and engines were not eligible for DERA grants to either retrofit or replace vehicles with newer models meeting the optional low NOx standards. This approach provides more cost-effective projects nationwide, since EPA PM standards went into effect in 2007. EPA acknowledges that there would be emission benefits, especially NOx, to extending the eligibility criteria to encompass 2007-2010 model year on-highway heavy-duty engines and vehicles.

As part of our response to this petition, EPA will review its approach and guidance regarding 2007-2010 model year eligibility for DERA funding for the 2017 RFP, with particular attention to the needs of areas in nonattainment for ozone. With regard to 1994-2006 model year

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<sup>29</sup> For DERA's most recent 2016 RFP, Category 1 eligibility extended to Class 5-Class 8 medium and heavy-duty on-highway vehicles including long-haul and local freight, drayage, delivery, bucket, beverage, refuse, furniture, dump, cement, and other highway vehicles with gross vehicle weight rates (GVWR) over 16,000 lbs.

on-highway category, EPA will continue to prioritize the optional low NOx standard retrofit and/or replacement options in its upcoming 2017 RFP and will ensure guidance is updated as needed to continue to encourage early deployment of ultra-low NOx engines.

## **V. Conclusion**

For the reasons discussed above, EPA acknowledges a need for additional NOx reductions from on-highway heavy-duty engines, particularly in areas of the country with elevated levels of air pollution. EPA believes that opportunity exists to develop, in close collaboration with CARB and other stakeholders, a new, harmonized and comprehensive national NOx reduction program for heavy-duty on-highway engines and vehicles.

Therefore, the EPA will initiate the work necessary to issue a Notice of Proposed Rulemaking for a new on-highway heavy-duty NOx program with the intention of proposing standards that could begin in Model Year 2024 (a major engine and vehicle standards implementation milestone year in the Heavy-Duty Phase 2 GHG program), consistent with the lead-time requirements of the Clean Air Act.