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Guidance for Quantifying and Using Long Duration Truck Idling Emission Reductions in State Implementation Plans and Transportation Conformity

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Guidance for Quantifying and Using Long Duration Truck Idling Emission Reductions in State Implementation Plans and Transportation Conformity

Transportation and Regional Programs Division
Office of Transportation and Air Quality

and

Air Quality Strategies and Standards Division
Office of Air Quality Planning and Standards

U.S. Environmental Protection Agency

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LIST OF ABBREVIATIONS

AC	Air Conditioning
APU	Auxiliary Power Unit
CAA	Clean Air Act
DOT	Department of Transportation
ECM	Engine Control Module
GPS	Global Positioning System
g/bhp-hr	Grams per brake horsepower hour
g/kW-hr	Grams per kilowatt hour
g/hr	Grams per hour
g/mile	Grams per mile
hp	Horsepower
hr	Hour
lbs	Pounds
NO_x	Nitrogen Oxides
PM	Particulate Matter (2.5 and 10)
RFP	Reasonable Further Progress
ROP	Rate of Progress
RPM	Revolutions Per Minute
SIP	State Implementation Plan
TIP	Transportation Improvement Program
TIUS	Truck Inventory and Use Survey
TSE	Truck Stop Electrification

Guidance for Quantifying and Using Long Duration Truck Idling Emission Reductions

(Note: As used in this document, the terms "we", "us" and "our" refer to EPA. The terms "you" and "your" refer to a state air pollution control agency or state or local transportation agency.)

Section A: Background Information

1. What is the purpose of this guidance?

The purpose of this document is to provide you with guidance on quantifying emission reductions from technologies which reduce long duration truck idling emissions from Class 8 trucks included in the state's on-road mobile sources inventory.[1] This guidance is not intended to apply to emission reductions resulting entirely from state or local anti-idling laws, regulations, or ordinances that limit a vehicle's idling time. You may wish to use the emission reductions resulting from implementing an idling reduction technology for meeting emission reduction requirements such as an RFP/ROP, attainment or maintenance SIP, or transportation conformity determination. Guidance on using these emission reductions for New Source Review offset purposes is addressed in a separate document.

2. How does this guidance relate to existing Clean Air Act (CAA) requirements?

This document provides guidance to state air pollution control agencies, transportation agencies, and the general public on how control measures to reduce truck idling emissions may be used to meet SIP requirements. SIP requirements can be found in Sections 110(a)(2) and 172(c) of the CAA, and transportation conformity requirements can be found in Section 176(c) of the CAA. This document does not substitute for those provisions, nor is it a regulation itself. Unless otherwise indicated, it does not impose binding, enforceable requirements on any party. Further, it does not assure that EPA may approve all instances of its application, and thus the guidance may not apply to a particular situation based upon the circumstances. The EPA and state decision makers retain the discretion to adopt approaches on a case-by-case basis that differ from this guidance where appropriate. Any decisions by EPA regarding a particular SIP demonstration will only be made based on the statute and applicable regulations, and will only be made following notice and opportunity for public review and comment. Therefore, interested parties are free to raise questions and objections about the appropriateness of the application of this guidance to a particular situation; EPA will, and states should, consider whether or not the recommendations in this guidance are appropriate in that situation. This guidance is a living document and may be revised periodically without public notice. The EPA welcomes public comments on this document at any time and will consider those comments in any future revisions of this guidance document.

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[1] Class 8 trucks are vehicles weighing over 33,001 pounds.

Readers of this document are cautioned not to regard statements recommending the use of certain procedures as either precluding other procedures or information or providing guarantees that using these procedures will result in actions that are fully approvable. As noted above, EPA cannot assure that actions based upon this guidance will be fully approvable in all instances, and all final actions may only be taken following notice and opportunity for public comment.

3. What are long duration truck idling emissions?

Long haul drivers will often rest for long duration periods in their sleeper compartment. In fact, the Department of Transportation (DOT) requires that a truck driver rest for at least 10 hours for every 14 hours of driving. During this rest period, truck drivers will often idle their engines to operate the air conditioning, heat, or on-board appliances such as a television or microwave. Truck drivers will also idle their engines to keep their engine and fuel warm in cold weather. Another reason for long duration idling occurs while a truck driver waits (for example, at a border crossing), or waits to load or unload their truck (for example, at a company loading dock, distribution center, or port). For purposes of this guidance, long duration idling is the operation of the truck's propulsion engine when not engaged in gear for a period greater than 15 consecutive minutes, except when associated with routine stoppages due to traffic movement or congestion.

4. What is an idle reduction technology?

An idle reduction technology consists of the use of an alternative energy source in lieu of using the main truck engine for the purpose of reducing long duration truck idling. Some of these technologies are mobile and attach onto the truck (mobile auxiliary power units (APUs)), and provide air conditioning, heat, and electrical power to operate auxiliaries such as a microwave.

Another technology involves electrifying truck parking spaces (stationary truck stop electrification (TSE)) with or without modifying the truck. In general, this involves power from the electrical grid providing energy to operate stationary equipment or on-board truck equipment to provide cab heating, cooling, and other needs.

This guidance addresses emission reductions generated from both mobile and stationary technologies. The EPA maintains a list of commercially available truck idle reduction technologies on its web site at the following address: http://www.epa.gov/otaq/retrofit/idlingtech.htm. This list is for informational purposes only, is not an endorsement or verification of any specific idle reduction technology, and is not intended as a complete list of all available idle reduction technologies.

5. What are the benefits from using technologies to reduce long duration truck idling emissions?

The primary purpose of this guidance is to quantify emission reductions in criteria air pollutants and their precursors. This guidance specifically addresses emission reductions of NO_x and $PM_{2.5}$ and PM_{10}.[2] In addition, there are other important benefits associated with reductions in long duration truck idling emissions including:

- Reductions in the emissions of toxic air pollutants such as formaldehyde, and trace metals such as nickel.
- Reductions in emissions of carbon dioxide.
- Reductions in fuel consumption, decreased maintenance costs, and longer engine life which results in cost savings to the truck owner.
- Reductions in noise levels.
- Decreased dependency on oil imports.

Local communities near truck stops, rest areas, and other areas where long duration idling occurs, some of which are comprised of low income and minority populations, may benefit from the reduced pollution and noise levels as will truck drivers and truck stop employees.

Section B: Basic Criteria Requirements for Long Duration Truck Idling Emissions Reductions

6. What are the basic criteria requirements for using emission reductions in SIPs or transportation conformity?

In order to be approved as a measure which provides additional emission reductions in a SIP or transportation conformity determination, a control measure reducing long duration truck idling emissions cannot interfere with other requirements of the CAA, and would need to be consistent with SIP attainment, maintenance, or RFP/ROP requirements. Specifically, the control measure must provide emission reductions that meet the criteria requirements described below. These requirements are found in the CAA section 110 provisions concerning SIPs.

(A) Quantifiable - The emission reductions from a control measure to reduce long duration truck idling emissions are quantifiable if they can be reliably and replicably measured. Emission reductions must be calculated for the time period for which the reductions will be used. Section D of this document provides you with a method for quantifying emission reductions. You can also submit your own quantification protocol which we will review and make a decision as to the appropriateness of its use on a case-by-case basis.

(B) Surplus - Emission reductions are generally surplus and can be used as long as they are not otherwise relied on to meet other applicable air quality attainment and maintenance requirements. In the event that the measure to reduce long duration truck idling emissions are relied on by you

[2] Based on data collected, almost all diesel PM is submicron in size. Therefore, we believe it is reasonable to use the same idling emission factor for both $PM_{2.5}$ and PM_{10}.

to meet such air quality related program requirements, they are no longer surplus and are not appropriate to be used for additional credit.

In addition, to be considered surplus for SIP purposes the emissions from long duration truck idling must be a part of the SIP's emissions inventory. For transportation conformity, the emissions from long duration truck idling must be part of the regional emissions analysis for the conformity determination.

(C) Federally Enforceable - Depending on how the emission reductions are to be used, control measures to reduce long duration truck idling emissions must be enforceable either: (1) through a SIP or SIP revision; (2) through a permit issued under a SIP approved permitting program; or (3) through a transportation conformity determination. Where the emission reductions are part of a rule, regulation, or permit they are considered federally enforceable if they meet all of the following requirements:

- They are independently verifiable.
- Violations are defined, as appropriate.
- You and EPA have the ability to enforce the measure if violations occur.
- Those liable for violations can be identified.
- Citizens have access to all the emissions-related information obtained from the responsible party.
- Citizens can file suits against the responsible party for violations.
- Violations are practicably enforceable in accordance with EPA guidance on practicable enforceability.
- A complete schedule to implement and enforce the measure has been adopted by the implementing agency or agencies.

If a SIP revision is approved under EPA's Voluntary Measures Policy, the state is responsible for assuring that the reductions credited in the SIP occur. The state would need to make an enforceable SIP commitment to monitor, assess and report on the emission reductions resulting from the voluntary measure and to remedy any shortfalls from forecasted emission reductions in a timely manner. Further, the total of all voluntary measures (including the idle emission reduction measures) may not exceed 3 percent of the total reductions needed to meet any requirements for RFP/ROP, attainment or maintenance as described under the policy. In the circumstance where the actual emission reductions achieved are more than the amount estimated in the SIP, you may take credit for the additional emission reductions provided it does not exceed the 3 percent cap on voluntary measures and meets the other provisions of the Voluntary Measures Policy. If you wish to have a SIP revision approved under the Voluntary Measures Policy consult that policy for further information.[3]

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[3] For a description of this policy consult the following web site: http://www.epa.gov/otaq/transp/traqvolm.htm.

(D) Permanent - The emission reduction must be permanent for the term that the emission reduction is used.

(E) Adequately Supported - The state must demonstrate that it has adequate funding, personnel, and other resources to implement the control measure on schedule.

7. What should you consider when implementing an idle reduction control measure?

(A) Use a commercially available idle reduction technology which provides cab comfort needs (such as heat or air conditioning), and/or reduces idling during the truck driver's long duration rest or wait period, in lieu of idling the main truck engine;

(B) Use an idle reduction technology that is equipped with a non-resettable meter, data logger, or computerized data acquisition system capable of measuring total hours it operated;

(C) Comply with all necessary monitoring and recordkeeping reporting, validation, and reconciliation requirements as described in Section E of this guidance.

(D) In the case of stationary idle reduction technologies:

(1) Ensure the technology is located in a nonattainment or maintenance area for the pollutant or precursor for which emission reductions are generated; and

(2) Prior to quantifying emission reductions, determine the historic idling activity for each location that will be generating emission reductions.[4] This information should include sufficient documentation, such as survey or direct observation methods to determine the following information:

(a) Percentage of truck parking spaces used at the location throughout the year (for example, annual occupancy rate);

(b) Of the percentage in (a) above, the percentage of those trucks which idle for a long duration (defined as 15 consecutive minutes or more at idle); and

(c)(1) Of the trucks in (b) above, the historic number of hours the trucks idled per day for an average summer weekday for the past year (if pursuing NO_x emission reductions in an ozone nonattainment/maintenance area); or

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[4] The historic idling activity should be used to estimate the idling emission reductions to be achieved from the use of an idle reduction technology. This estimate should be compared with the actual emission reductions achieved after the monitoring period, as discussed in Section E.

(c)(2) Of the trucks in (b) above, the historic number of hours the trucks idled per day for an average annual weekday for the past year (if pursuing PM or NO_x emission reductions in a PM nonattainment or maintenance area).[5]

(E) In the case of mobile idle reduction technologies:

(1) Ensure the truck is equipped with a global positioning system (GPS) or another method that is capable of demonstrating that the truck is in the nonattainment or maintenance area throughout the time frame during which the emission reduction is quantified[6]; and

(2) Prior to quantifying emission reductions, determine the historic idling activity for each truck that will be generating emission reductions. This information should include sufficient documentation, such as data from an engine control module and GPS to determine the following information:

(a) The historic number of hours the trucks idled per day for an average summer weekday for the past year (if pursuing NO_x emission reductions in an ozone nonattainment/maintenance area); or

(b) The historic number of hours the trucks idled per day for an average annual weekday for the past year (if pursuing PM or NO_x emission reductions in a PM nonattainment or maintenance area).[7]

(3) Prior to generating emission reductions, you should collect the following information for the mobile idle reduction technology only: the manufacturer and manufacture date of the idle reduction technology, its engine model, and average daily horsepower load for the time period for which you will be generating emission reductions.

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[5] If dealing with large numbers of vehicles, you can use fleet idling averages to determine the historic long duration idling activity as demonstrated by previously recorded engine control module data on a representative sample of trucks that travel through the nonattainment or maintenance area.

[6] Methods other than GPS should provide a high degree of confidence that the truck did, in fact, reduce idling emissions in the nonattainment or maintenance area. Truck driver logs typically do not provide a high degree of confidence.

[7] If dealing with large numbers of vehicles, you can use fleet idling averages to determine the historic long duration idling activity as demonstrated by previously recorded engine control module data on a representative sample of trucks that travel through the nonattainment or maintenance area.

Section C: Specific Considerations for Using Long Duration Truck Idling Emission Reductions

8. <u>What are the total long duration truck idling emissions included in the SIP's emissions inventory or the regional conformity analysis</u>?

Some fraction of long duration truck idling emissions are included in emission inventories based on MOBILE6 estimates through the model's use of conversion factors, but these emissions are not a distinct and separate category. In particular, MOBILE6 uses conversion factors to convert from g/bhp-hr to g/mile. The conversion factors were determined based on factors including fuel economy estimates. These fuel economy estimates came from the U.S. Census Bureau's 1992 Truck Inventory and Use Survey (TIUS) study. Many of the TIUS respondents reported fuel economy as long-term average fuel use per mile traveled, including fuel used during long duration truck idling. The incorporation of these numbers in the g/bhp-hr to g/mile conversion factors means that some fraction of long duration idling activity is included in the g/mile emissions factors produced by MOBILE6.

After reviewing the impact of fuel consumption on the conversion factor for Class 8 trucks and the impact of the conversion factor on the g/mile emission factors for Class 8 trucks produced by MOBILE6, we believe long duration truck idling emissions account for not more than 3.4 percent of the total emissions for Class 8 trucks for any criteria pollutant or precursor in MOBILE6. Consequently, the total annual or average daily emissions reductions for all long duration idling controls in a nonattainment or maintenance area in any year is limited to an amount not to exceed 3.4 percent of the total annual or average daily Class 8 truck emissions for that year.[8]

To quantify the total allowable emission reductions, for use in the on-road mobile source inventory, you should first determine the total emissions from heavy duty diesel Class 8 trucks in the MOBILE6 emissions inventory or conformity analysis for the year in question and multiply that value by 0.034 (3.4 percent). For example, the total allowable emission reductions for NO_x in 2010 would be 3.4 percent of the Class 8 truck NO_x inventory for 2010. Likewise, the total allowable emission reductions for $PM_{2.5}$ and PM_{10} in 2010 would be 3.4 percent of the Class 8 truck $PM_{2.5}$ and PM_{10} inventory for 2010.[9] MOBILE6 projects a decrease in emissions from heavy duty diesel Class 8 trucks in future years. Consequently, the total reductions a

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[8] The 3.4 percent limit on the total amount of emission reduction that can be used only applies where the on-road mobile source inventory is based on MOBILE6 estimates. In those circumstances where the inventory is based on the latest EPA-approved California Air Resources Board's Vehicle Emission Inventory modeling system (EMFAC), we will work with you on a case-by-case basis to determine the appropriate amount.

[9] It is important to note that the annual emission factors for PM in Appendix C rely on MOBILE6.2 which will include PM emissions factors. The EPA will officially release MOBILE6.2 for SIP and transportation conformity purposes in the near future.

nonattainment or maintenance area can claim from all strategies to reduce long duration truck idling emissions, regardless of whether they are used for SIPs or transportation conformity, will also decrease in future years.

The MOVES model, currently under development and intended to replace MOBILE6, will address long duration truck idling separately from other truck emissions and will correct any discrepancies in the actual long duration truck idling inventory. When we approve the MOVES model, you can use the long duration idling inventory number provided by that model. Until that time, if you rely on MOBILE6 you should use the 3.4 percent limit.

9. How can the estimated emission reductions be used for SIP purposes?

For your SIP RFP/ROP, attainment or maintenance strategy, you can use the emission reductions which are, or expected to be, generated from the idling reduction technology by applying the following criteria:

(A) Based on the historic idling hours as determined in question 7(D)(2) and 7(E)(2) above, the estimated and actual emission reductions per day from the idle reduction project should be a percentage of the historic idling hours per day. In the circumstance where the estimated or actual hours idled exceeds the historic idling hours, you should provide an explanation as to the reason for the difference if you decide to seek credit for the additional amount (that is, the actual amount). We will evaluate the reason for the difference and make a decision as to the quantity of the emission reduction available on a case-by-case basis.[10]

(B) Where required, emission reductions must account for seasonality. For example, if your SIP only credits those reductions which take place during the summer ozone season, then only reductions in idling emissions which take place during that season may be credited.

(C) The total emission reductions from all controls on long duration truck idling for each criteria pollutant or precursor should not to exceed 3.4 percent of the Class 8 truck SIP emissions inventory for a given year when using MOBILE6 or MOBILE6.2 (see footnote 9 for California exception).

10. How can the emission reductions be used for transportation conformity purposes?

The transportation conformity regulation (40 CFR parts 51 and 93) describes the requirements for including emission reductions from on-road mobile control measures in a

[10] For both mobile and stationary idle reduction technologies, determining the historic idling hours forms the basis for estimating the potential emission reductions. Differences between the historic idling hours and estimated or actual idling hours may occur due to, for example, warmer or colder temperatures than the historic time period.

conformity determination for a transportation plan, transportation improvement program (TIP), or transportation project. The conformity rule requires a regional emissions analysis be conducted for all non-exempt projects included in the transportation plan and TIP. In the regional emissions analysis, the emissions from future transportation activities are estimated or modeled, just as they are when creating or revising a SIP's motor vehicle emissions inventory (or "motor vehicle emissions budget"). If credit is obtained for an idle reduction project in the SIP's budget, this does not preclude it from also being used towards the transportation conformity determination.

To include NO_x or PM emission reductions from a truck idling control measure in a regional conformity analysis, the appropriate jurisdictions must be committed to the measure. The appropriate level of commitment varies according to the requirements outlined in 40 CFR 93.122(a) which are described as follows:

(A) If the measure does not require a regulatory action to be implemented, it can be included in a conformity determination if it is included in the transportation plan and TIP with sufficient funding and other resources for its full implementation.

(B) If the measure requires a regulatory action to be implemented, it can be included in a conformity determination if one of the following has occurred:

(1) The regulatory action for the measure is already adopted by the enforcing jurisdiction (e.g., a state has adopted a rule to require a control measure);

(2) The measure has been included in an approved SIP; or

(3) There is a written commitment to implement the measure in a submitted SIP with a motor vehicle emissions budget that we have found adequate.

(C) If the measure is not included in the transportation plan and TIP or the SIP, and it does not require a regulatory action to be implemented, then it can be included in the conformity determination's regional emissions analysis if the conformity determination contains a written commitment from the appropriate entities to implement the measure.

Whatever the case, the emission reductions can only be applied in a conformity determination for the time period or years in which the truck idling control measure will be implemented. Written commitments must come from the agency with the authority to implement the measure. The latest emissions model and planning assumptions must be used when calculating emission reductions from the measure, according to 40 CFR 93.110 and 93.111.

You should utilize the conformity interagency consultation process to discuss the methods and assumptions used to quantify the reductions from the measure. Section D of this document provides you with a method for quantifying emission reductions. You can also submit your own quantification protocol which should include documentation of the methodology, assumptions, and models that were used to calculate emission reductions from long duration truck idling measures, as well any commitments that are necessary to implement the project, as described above. The conformity determination should also document that the total emission reductions from all controls on long duration truck idling for a given pollutant or precursor is not to exceed 3.4 percent of the Class 8 truck emissions in the regional conformity analysis for a given year when using MOBILE6 or MOBILE6.2 (see footnote 9 for California exception).

Section D: Quantifying Long Duration Truck Idling Emission Reductions

The following steps describe how to estimate the emission reductions from a proposed idle reduction project. In addition, these same steps can be used to determine the actual emission reductions achieved from the project. Step 1 establishes the historic idling activity from which you will estimate an emission reduction. Steps 2 and 3 describe how to estimate the truck emissions that are reduced when using an idle control technology. Step 4 describes how to estimate the emissions associated with the idle reduction technology (this step is usually not necessary if using a stationary idle reduction technology). Steps 5 and 6 describe how to estimate the net reduction in emissions for the entire project. Finally, Steps 7 and 8 describe how to determine how much of the net reduction is creditable in a SIP or transportation conformity determination. Appendix D provides a summary of Steps 1-6. Appendices E and F provide quantification examples for mobile and stationary technologies.

11. How do you quantify emission reductions from the use of an idle reduction technology?

Step 1: *Determine the historic idling activity of the trucks involved in the project.*

For each truck using a mobile idle reduction technology, determine the historic idling hours as described in question 7(E)(2). Likewise, for each parking space which will have a stationary idle reduction technology installed, determine the historic idling hours as described in question 7(D)(2).[11]

Step 2: *Select the emission factor for the criteria air pollutant or precursor.*

In Appendix B and C, we provide emission factors for NO_x and PM.[12] These emission factors represent average emissions from a long duration idling truck. For NO_x emissions, the

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[11] If dealing with large numbers of vehicles, you can use fleet idling averages to determine the historic idling activity as demonstrated by previously recorded engine control module data on a representative sample of trucks that travel through the nonattainment or maintenance area.

[12] As stated above, where the inventory is based on the latest approved California EMFAC model, we will work with you on a case-by-case basis to determine the appropriate emission factors.

emission factor is 135 g/hr. For PM emissions, the emission factor will range from 0.33 g/hr to 3.68 g/hr depending on the year in which the emission reduction is generated. Consult Appendix B and C for a full explanation of the basis for the emission factors. In the future, we may update the emission factors or include other criteria air pollutants or precursors.

Step 3*: Multiply the emission factor in Step 2 by the number of hours per day the idle reduction technology is estimated to be used.*

Estimate the average number of hours per day of idling emissions to be eliminated by the use of the idle reduction technology. The estimated hours should be a percentage of the historic idling activity as determined in Step 1. In the case of mobile technologies, estimate the number of hours that the technology will reduce long duration idling for each truck while in the nonattainment/maintenance area. For stationary technologies, estimate the number of hours that the technology will reduce long duration idling for each parking space. When determining the actual emission reductions from an existing project, using a mobile or stationary technology, use the actual hours the technology was used.

When estimating the number of reduced hours of idling per day you need to consider the particular pollutant or precursor and how the idling may vary by season or annually (for example, average summer weekday or average annual weekday) as described in question 7(D)(2) and 7(E)(2).

Thus, to determine the emissions (g/day) from an individual truck prior to the use of an idle reduction technology use the following equation:

$$\text{Emission Per Day} = EF_{BASE} * AL_{IRT}$$

Where,

EF_{BASE} = Truck baseline emission factor (NO_x or PM in g/hr) (See Appendix B or C)

AL_{IRT} = Estimated hours of use of idle reduction technology (hr/day)

Step 4(a): *Determine emission factor for the mobile idle reduction technology.*

In the case of stationary TSE, for the purpose of this guidance, it may be presumed that all emissions from power plants (including any increase in demand resulting from a TSE project) will be accounted for in projections of, or limits on, overall power plant emissions in the SIP's emission inventory. Therefore, related TSE emissions at power plants should not be considered when quantifying the emission reductions associated with a TSE project.[13]

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[13] To the extent that there may be a concern that the power plant emission increases resulting from a TSE project are not otherwise reflected in the state's overall consideration of power plant emissions, then the power plant increases in the nonattainment/maintenance area from a TSE project, where quantifiable, should be considered when quantifying the amount of emission reductions.

If a TSE project does not rely on energy from the electrical grid, but instead is using an alternative source of electricity (for example, a portable generator), then you should provide data that demonstrates the emissions associated with that energy source. The data should comply with EPA regulations regarding the measurement of emissions from that energy source. If no regulations exist, provide all emissions data available to you for the energy source. We will review this information and determine its appropriateness for use on a case-by-case basis.

You will now determine the emission factor associated with the mobile idle reduction technology used. If the mobile idle reduction technology is an EPA certified diesel fueled non-road engine, as is the case with many APUs, use the emission factor provided for that engine family by the manufacturer as part of its certification application under 40 CFR Part 89. This factor is in g/kW-hr or g/bhp-hr and is publicly available (in Step 4(b) you will convert this factor to g/hr so the terms are consistent with Step 3). You should know the engine manufacturer's name, year of manufacture, and 12-character EPA engine family number. This information is available on the engine label. You can obtain the emission data by contacting EPA's Office of Transportation and Air Quality (Certification and Compliance Division) or consulting the certification data at http://www.epa.gov/otaq/certdata.htm (search under "Non-Road Compression Ignition Engine" and "Engine Family General Information" using the engine's manufacture date).

Step 4(b): *When using a mobile idle reduction technology, multiply emission factor from 4(a) by the average daily horsepower load of the mobile idle reduction technology. Skip this step for a stationary idle reduction technology.*

Since the mobile idle reduction technology emission factor is usually in g/bhp-hr, you should convert this emission factor to g/hr by multiplying by the average daily horsepower load. This step involves determining the average daily horsepower load which refers to the power use of the technology. This power use will differ during different times of the year depending on power needs (AC or heat). For mobile auxiliary power units (including generator sets), the average daily horsepower load ranges from 4-8 hp. You should contact the idle reduction technology manufacturer (not the engine manufacturer) to determine the average daily horsepower load within this range for the time period considered. If the technology emission factor is in kW, you should convert this to horsepower by multiplying the kW by 1.34. Multiplying the emission factor by the daily horsepower load gives a gram per hour emission factor for the engine.

Step 4(c): *When using a mobile idle reduction technology, multiply the g/hr factor by the number of operating hours (per day) it is estimated to be used. Skip this step for a stationary idle reduction technology.*

Thus, to determine the emissions (g/hr) for the idle reduction technology you should follow the following equation:

$$\text{Idle Reduction Technology Emission} = EF_{IRT} * HP * AL_{IRT}$$

Where,

EF_{IRT} = Idle reduction technology emission factor (NO_x or PM in g/bhp-hr)

HP = Average daily HP load

AL_{IRT} = Estimated hours of use of idle reduction technology (hr/day)

Step 5: *Determine the net emission reduction for the mobile technology. Skip this step for a stationary idle reduction technology.*

To determine the net emission reduction, subtract the emissions associated with the idle reduction technology as determined in Step 4 from the truck emissions as determined in Step 3. The equation is as follows:

$$NER = (EF_{BASE} * AL_{IRT}) - (EF_{IRT} * HP * AL_{IRT})$$

Where,

NER = Net emission reductions in grams per day

EF_{BASE} = Baseline emission factor (NO_x or PM in g/hr)

AL_{IRT} = Estimated hours of use of the idle reduction technology (hr/day)

EF_{IRT} = Idle reduction technology emission factor (NO_x or PM in g/bhp-hr)

HP = Average daily HP load

AL_{IRT} = Estimated hours of use of the idle reduction technology (hr/day)

Net average daily emission reductions can be converted from grams to pounds by dividing by 454. If necessary for estimating annual reductions of NO_x or PM, average daily emissions reduced can be converted to annual emissions reduced by multiplying by the number of days in the year it is assumed the technology will be used.

Step 6: *Sum all emission reductions for the project.*

For a truck stop electrification project, the sum would include the emission reductions from the use of all the electrified parking spaces. For mobile technologies, the sum would include the emission reductions from all the participating trucks.

Step 7: *Make sure net average daily emissions reduced from the idling reduction project do not exceed the historic idling activity of the trucks involved in the project as determined in Step 1.*

The daily emission reductions per day from the idle reduction project should be a percentage of the historic idling hours per day. In the circumstance where the actual hours idled exceeds the historic idling hours, you should provide an explanation as to the reason for the difference if you seek credit for the additional reduction. We will evaluate the reason for the difference and make a decision as to the quantity of the emission reduction available on a case-by-case basis. Where verified, the additional emission reduction may be credited.

Step 8: *Make sure the net average daily emission reductions from all idling reduction projects do not exceed the total long duration idle emissions accounted for in the SIP's regional inventory or regional conformity analysis.*

The net average daily emission reductions for all existing and new long duration truck idling reduction projects in a nonattainment or maintenance area should be summed to determine the total reductions from all programs for a given year. The total reductions claimed for all programs should not exceed 3.4 percent of the emission estimate for Class 8 trucks for any criteria air pollutant or precursor used in the applicable SIP inventory or conformity analysis for the calendar year in question (see footnote 9 for California exception). See Section C for detailed discussion.

12. How do you quantify emission reductions for other criteria air pollutants or precursors?

To quantify emission reductions for other criteria air pollutants or precursors (such as hydrocarbon emissions), you can follow the same steps outlined in this section, substituting an EPA approved idling emission factor for that pollutant or precursor. Once we have identified an idling emissions factor for use, similar to those listed or referenced in this document, it may subsequently be used in the same manner without additional review by us. If no idling emission factor has been identified, you can submit data supporting an idling emission factor and we will review this data on a case-by-case basis and make a decision as to the appropriateness of its use.

Section E: Monitoring and Penalties

13. What monitoring and record keeping should occur to document long duration truck idling emission reductions?

(A) For each truck or location generating emission reductions, the responsible party should monitor and record the following information for each time period for which an emission reduction is generated (or other information capable of demonstrating the emission reductions to our satisfaction).[14]

(1) For mobile and stationary technologies, the number of hours the idle reduction technology operated while the main truck engine did not idle, recorded by a non-resettable meter, data logger, or computerized data acquisition system capable of recording total hours operated on each truck.

(2) For mobile technologies only, GPS data or data from another method that demonstrates that the information recorded from (1) above occurred in the nonattainment or maintenance area.[15]

(B) All information to be monitored and recorded in accordance with this guidance for existing SIP requirements should be maintained by the responsible party for a period of no less than five years.

14. What validation and reconciliation should occur for emission reductions in SIPs approved under the Voluntary Measures Policy?

The SIP submission for a voluntary measure should contain a description of the evaluation procedures and time frame(s) in which the evaluation of SIP reductions will take place. Once the voluntary control measure is in place emission reductions should be evaluated by you as required to validate the actual emission reductions. You should submit the results of your evaluation to EPA in accordance with the schedule contained in the SIP. If the review indicates that the actual emission reductions are not consistent with the estimated emission reductions, then the amount of credit should be adjusted appropriately and applicable remedial measures should be taken under the Voluntary Measures Policy. See the EPA's Voluntary Measures Policy for further information regarding validation and reconciliation requirements for such measures.

15. What types of penalties can be assessed for not complying with CAA requirements?

Use of this guidance does not relieve the responsible party of any obligation to comply with all otherwise applicable CAA requirements, including those pertaining to the crediting of emission reductions for your SIP, such as emission reductions for your attainment or maintenance strategy. Violations of CAA requirements are subject to administrative, civil, and/or criminal enforcement under Section 113 of the CAA, as well as to citizen suits under

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[14] The responsible party using a mobile idle reduction technology will likely be a truck fleet. For a stationary idle reduction technology, the responsible party will likely be the location owner (or lessee) who owns and controls the technology.

[15] Methods other than GPS should provide a high degree of confidence that the truck did, in fact, reduce idling emissions in the nonattainment or maintenance area. Truck driver logs typically do not provide a high degree of confidence.

Section 304 of the CAA. The full range of penalty and injunctive relief options would be available to the federal or state government (or citizens) bringing the enforcement action.

Section F: The SIP Process for Using Long Duration Truck Idling Emission Reductions

16. What must a state submit to EPA to meet the requirements for incorporating a source specific control measure in a SIP?

You must submit to EPA a written document which:

(A) Identifies and describes the idle reduction project and its implementation schedule to reduce long duration truck idling emissions within a specific time period;

(B) Contains a quantification methodology to estimate the emission reductions from the idle reduction project. You can follow the quantification methodology provided in Section D of this document or you can submit your own. If you submit your own quantification methodology for quantifying the emission reductions, you must provide all relevant technical support documentation, including the information and quantification uncertainties used to calculate emission reductions. You must rely on the most recent information available at the time the SIP is developed;

(C) Contains federally enforceable requirements for the responsible party (truck or location owner) to monitor and record the appropriate information;

(D) Under the Voluntary Measures Policy only, enforceably commits to evaluate and report the resulting emission reductions of the measure as applicable;

(E) Enforceably commits to remedy any SIP emission shortfall in a timely manner if the measure does not achieve estimated emission reductions; and

(F) Meets all other requirements for SIP revisions under sections 110 and 172 of the CAA.

Section G: Contact Information

17. Who should you contact for additional information?

State agencies, the regulated community and members of the public with questions concerning a case-specific application of this guidance should contact the EPA Regional Office with responsibility for air quality planning in the area where the idle reduction project is located. A contact list of your EPA Regional Office is available at the following web address: http://www.epa.gov/epahome/locate2.htm

For general questions regarding the quantification of truck idling emissions reductions, please contact Paul Bubbosh of EPA's Office of Transportation and Air Quality at (202) 343-

9322 or David Solomon of EPA's Office of Air Quality Planning and Standards at (919) 541-5375.

For general questions concerning the use of truck idling emissions reductions in SIP on-road mobile emissions inventories or in transportation conformity, please contact Meg Patulski of EPA's Office of Transportation and Air Quality at (734) 214-4842.

Appendix A

DEFINITIONS

For the purposes of this guidance only, the following definitions apply:

(A) ACTUAL IDLING EMISSION REDUCTIONS means the emission reductions achieved from an idle reduction project.

(B) CLASS 8 TRUCK means a truck with a gross vehicle weight rating (GVWR) of 33,001 pounds and over. GVWR is the weight of the truck and its payload, plus fuel and driver.

(C) ESTIMATED IDLING EMISSION REDUCTIONS means the projected emission reductions from an idle reduction project which is based on a percentage of the historic idling activity.

(D) GLOBAL POSITIONING SYSTEM means a satellite-based radio navigation receiver capable of providing the time, date, and position of the truck.

(E) HISTORIC IDLING ACTIVITY means the demonstrated past long duration idling of a Class 8 truck, or past long duration idling from Class 8 trucks at a particular location, in the nonattainment or maintenance area.

(F) IDLE REDUCTION TECHNOLOGY means a commercially available technology or device that provides truck cab comfort needs, or otherwise reduces the need for long-duration truck idling.

(G) LONG DURATION IDLING means the operation of a truck's propulsion engine of a Class 8 truck for a period greater than 15 consecutive minutes at a time at which the main drive engine is not engaged in gear (excluding routine stoppages due to traffic movement or congestion).

Appendix B

NO_x Emission Factors for Long Duration Idling Heavy Duty Diesel Vehicles

Year	NO_x Emission Factor (g/hr)
2002-2030	135

The emissions of trucks engaged in long duration idling vary due to factors such as engine manufacturer, age of vehicle, rpm at idle, and ambient temperature which influences the use of auxiliaries such as air conditioning or heat. Based on an analysis of emission test data[16], we have determined that, for NO_x emissions, an emission rate of 135 grams per hour is a reasonable average rate for long duration truck idling.

At this time, the impact of future NO_x emissions standards on long duration idling emissions is uncertain. Control measures, such as catalytic converters, intended to reduce running emissions of diesel trucks in the future, may likely be less effective at controlling long duration idle emissions. As a result we have concluded that it is reasonable to use the emission rate of 135 grams per hour for NO_x for analyses of both current and future calendar years. We will review this assumption as emissions data on diesel trucks with more advanced control technology become available, and update these emission factors as appropriate.

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[16] See the following reports: "Idle Emissions from Heavy-Duty Diesel and Natural Gas Vehicles at High Altitude," Robert McCormick, et al, Colorado Institute for Fuels and Engine Research, Colorado School of Mines, Journal of the Air and Waste Management Association, Revised May 3, 2000; "Study of Exhaust Emissions from Idling Heavy-duty Diesel Trucks and Commercially Available Idle Reducing Devices," Han Lim, US EPA Office of Transportation and Air Quality, September 2002; "Preliminary Results for Stationary and On-Road Testing of Diesel Trucks in Tulare, California," Douglas Lambert, et al, Clean Air Technologies Inc., May 15, 2002; "NO_x Emissions and Fuel Consumption of HDDVs during Extended Idle," David K. Irick, University of Tennessee, Bob Wilson, IdleAire Technologies Inc., Coordinated Research Council 12th Annual On-Road Vehicle Emission Workshop, San Diego, California, April 15-17, 2002; "Heavy-duty Vehicle Chassis Dynamometer Testing for Emissions Inventory, Air Quality Modeling, Source Apportionment and Air Toxics Emissions Inventory," Phase I Interim Report, CRC Project No. E-55/E-59, Mridul Gautam and Nigel N. Clark, et al, West Virginia University Research Corporation, July 2002; "Heavy-duty Vehicle Emissions," National Cooperative Highway Research Program Project 25-14, Cambridge Systematics, Inc., with Battelle, Sierra Research and West Virginia University. October 2002; "Internal Report - Idle Emissions from Heavy-Duty Diesel Trucks in the New Your Metropolitan Area", Tang and Munn, New York State Dept of Environmental Conservation, November 9, 2001; "Potential Benefits of Utilizing Fuel Cell Auxiliary Power Units in Lieu of Heavy-Duty Truck Engine Idling," Broderick, Dwyer, et al. Institute of Transportation Studies, University of California - Davis.

Appendix C

PM Emission Factors for Long Duration Idling Heavy Duty Diesel Vehicles

Table 1. For use in stationary truck stop electrification projects

Calendar Year	$PM_{2.5}/PM_{10}$ Emission Factor (g/hr)
2006 and earlier	3.68
2007	3.43
2008	2.94
2009	2.52
2010	2.16
2011	1.88
2012	1.60
2013	1.38
2014	1.10
2015	0.89
2016	0.79
2017	0.71
2018	0.58
2019	0.54
2020	0.50
2021	0.47
2022	0.44
2023	0.41
2024	0.39
2025	0.38
2026	0.36
2027	0.35
2028	0.34
2029	0.33
2030	0.33

Table 2. For use in mobile idle reduction technology projects

Truck Model Year	$PM_{2.5}/PM_{10}$ Emission Factor (g/hr)
2006 and earlier	3.68
2007 and later	0.33

Based on an analysis of emission test data[17], we have determined that an emission rate of 3.68 g/hr is a reasonable average total direct PM emission factor from long duration idling for individual trucks prior to the 2007 model year and for truck fleets prior to the 2007 calendar year. Based on data collected, almost all diesel PM is submicron in size. Therefore, we believe it is reasonable to use this emission factor for both $PM_{2.5}$ and PM_{10} calculations for 2002.

As in the case of NOx emissions, there is some uncertainty about the impact of future PM emissions standards on long duration idling. However, the control technologies used to control running PM emissions are based on filters and traps which are more likely to show increased effectiveness under long duration idling conditions. Therefore, we expect long duration idling emissions to decline in the future at a rate similar to the expected decline in running emissions. We will review this assumption as emissions data on diesel trucks when more advanced control technology become available, and update these emission factors as appropriate. In the meantime, emission factors from the previous tables should be used for a given year to estimate long duration idling $PM_{2.5}$ and PM_{10} emissions from Class 8 vehicles.

Emission factors from Table 1 should be used in cases where stationary truck stop electrification (TSE) is used as the long duration idle control measure. The emission factors in Table 1 are fleet average emission factors assuming fleet turnover to cleaner trucks beginning in 2007. They are based on the assumption that the age mix of trucks using the truck stops will be similar to the default age mix in MOBILE6.2. For a TSE project, choose the emission factor for the calendar year of evaluation. For example, to estimate the benefits of a truck stop electrification project in 2010, assume an emission factor of 2.16 g/hr for $PM_{2.5}$ and PM_{10}. To estimate the benefits of a truck stop electrification project in 2020, assume an emission factor of 0.50 g/hr for $PM_{2.5}$ and PM_{10}.

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[17] Storey, J., Thomas, J., *et at.*, "Particulate Matter and Aldehyde Emissions From Idling Heavy-Duty Diesel Trucks," Society of Automotive Engineers, Inc. Publication 2003-01-0289 (2001); "Idle Emissions from Heavy-Duty Diesel and Natural Gas Vehicles at High Altitude," Robert McCormick, et al, Colorado Institute for Fuels and Engine Research, Colorado School of Mines, Journal of the Air and Waste Management Association, Revised May 3, 2000; "NOx Emissions and Fuel Consumption of HDDVs during Extended Idle," David K. Irick, University of Tennessee, Bob Wilson, IdleAire Technologies Inc., Coordinated Research Council 12th Annual On-Road Vehicle Emission Workshop, San Diego, California, April 15-17, 2002; "Heavy-duty Vehicle Chassis Dynamometer Testing for Emissions Inventory, Air Quality Modeling, Source Apportionment and Air Toxics Emissions Inventory," Phase I Interim Report, CRC Project No. E-55/E-59, Mridul Gautam and Nigel N. Clark, et al, West Virginia University Research Corporation, July 2002.

Emission factors from Table 2 should be used in cases where mobile idle reduction technologies are used as the idle control measure. The emission factors in Table 2 are model year specific emission factors. For a mobile idle reduction project, choose the emission factor for the model year of the vehicle that the mobile idle reduction technology is installed on. For example, to estimate the benefits of adding an APU to a 2002 model year truck, assume a long duration idling emission factor for the truck of 3.68 g/hr for $PM_{2.5}$ and PM_{10}. To estimate the benefits of adding an APU to a 2010 model year truck, assume a long duration idling emission factor for the truck of 0.33 g/hr for $PM_{2.5}$ and PM_{10}. These same emission factors would be used for any calendar year of evaluation; that is, for estimating the benefits of a 2002 model year truck using an APU in 2012, assume a long duration idling emission factor for the truck of 3.68 g/hr for $PM_{2.5}$ and PM_{10}.

Appendix D

Quantification Summary

The purpose of this quantification summary is to provide a concise formula to calculate the net emission reduction for long duration truck idling. This summary is intended to be consistent with the more detailed step-by-step process in Section D.

$$NER = (EF_{BASE} * (AL_{IRT} / CF_{G/LBS})) - (EF_{IRT} * HP * (AL_{IRT} / CF_{G/LBS}))$$

Where,

NER = Net emission reduction

EF_{BASE} = Truck baseline emission factor (NO_x or PM in g/hr)

AL_{IRT} = Estimated hours of use of the idle reduction technology (hr/day)

$CF_{G/LBS}$ = Conversion factor for grams to pounds which is 454

EF_{IRT} = Idle reduction technology emission factor (NO_x or PM in g/bhp-hr)

HP = Average daily horsepower load (ranges from 4-8 hp depending on the technology; contact the technology manufacturer)

AL_{IRT} = Estimated hours of use of the idle reduction technology (hr/day)

There are three essential parts to this formula. First, you determine the emissions from the truck by selecting the emission factor for the pollutant or precursor for reduction, multiply this factor by the number of hours you estimate the technology will reduce long duration idling emissions. This number is divided by the conversion factor to derive a grams per hour number. The second part is to determine the emissions associated with the idle reduction technology (this step typically does not apply to stationary idle reduction technologies). This requires determining the emissions associated with the technology, multiplying this by the horsepower to derive a grams per hour number, multiplying this number by the number of hours the technology will operate, and then dividing this number by the conversion factor. The final part is simply subtracting the emissions from the second part (idle reduction technology emissions) by the first part (truck's baseline emissions) to arrive at the net emission reduction.

Appendix E

Example Quantification

Mobile Idle Reduction Technology

This example is for the purpose of illustrating the quantification steps only, and it does not address the additional considerations to credit the reductions generated. In this example we will estimate the NO_x long duration idling emission reductions from idling Class 8 trucks using a mobile idle reduction technology in 2007. In the nonattainment area, 100 vehicles will use this technology 7 hours per day. This is the only long duration truck idle reduction project in the nonattainment area. Total Class 8 truck NO_x emissions projected for the nonattainment area in 2007 are 80 tons per day.

For the idle reduction technology, we will use an auxiliary power unit (APU). The APU allows an idling truck to be shut down by providing air conditioning, heat, and electrical power to operate auxiliaries such as a television and microwave.

Per the steps outlined in Section D of this document, the NO_x emission reductions associated with the use of the APU is calculated as follows:

Step 1: *Determine the historic idling activity of the truck involved in the project*.

You should follow the discussion provided in question 7(E)(2) in this guidance to derive the historic number of hours the trucks idled for an average summer weekday for the past year in the nonattainment or maintenance area. In this example, we determined a truck's long duration idling occurred an average of 8 hours per day.

Step 2: *Select the emission factor for the criteria air pollutant or precursor.*

We are evaluating NO_x emission reductions so the emission factor is 135 grams per hour.

Step 3: *Multiply the emission factor in Step 2 by the number of hours per day the idle reduction technology is estimated to be used*.

We estimated that the APU will reduce 7 of the 8 hours of long duration idling. Therefore, the average daily emissions reduced is 135 grams/hr * 7 hours/day = 945 grams/day

Step 4(a): *Determine emission factor for the mobile idle reduction technology.*

In this example, the APU uses a 2003 Kubota engine (EPA engine family 3KBXL.719KCB)[18] which was certified under 40 CFR Part 89. By examining the certification data for this engine family, we find the certified NO_x emission level is 4.7 g/bhp-hr.[19]

Step 4(b): *When using a mobile idle reduction technology, multiply emission factor from 4(a) by the average daily horsepower load of the mobile idle reduction technology.*

According to an APU manufacturer, the average daily horsepower load for this engine during typical summer weekdays is 5 hp. The grams per hour emission rate of the auxiliary power unit is 4.7 g/bhp-hr * 5 hp = 23.5 g/hr.

Step 4(c): *When using a mobile idle reduction technology, multiply the g/hr factor by the number of operating hours (per day) it is estimated to be used.*

As a result, the total average daily emissions of the APUs are 23.5 grams/hr * 7 hours/day = 164.5 grams/day.

Step 5: *Determine the net emission reduction.*

The estimated net emissions reductions from this program are 945 grams/day - 164.5 grams/day = 780.5 grams/day or 1.72 lbs/day.

Step 6: *Sum all emission reductions for the project.*

In this example, we estimate that all trucks will operate in a similar manner. In practice, each truck could have its own idling emission reductions. We add the total amount of idling for all 100 participating trucks in the project which is 100 * 780.5 = 78,050 grams/day or 171.9 lbs/day.

Step 7: *Make sure the net average daily emission reductions from the idling reduction project do not exceed the historic idling activity of the trucks involved in the project as determined in Step 1.*

This step involves taking your estimate of idling activity (or the actual emission reduced) and reconciling this estimate (or actual number) with your historic idling hours from Step 1 (following question 7(E)(2)). If the estimate (or actual number) exceeds the historic idling hours, you will need to explain this increase if you seek credit for the estimated (or actual) amount. In this example, the estimate does not exceed the historic idling activity.

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[18] For purposes of this example we have selected a specific engine model to better illustrate the APU's emissions. The use of this engine model does not confer any endorsement of this company or its products.

[19] In some circumstances, the NO_x emission factor is reported as a combined NO_x + HC emission factor. You will need to contact the engine manufacturer to determine the NO_x only value.

Step 8: *Make sure the net average daily emission reductions from all idling reduction projects do not exceed the total long duration idle emissions accounted for in the regional inventory used in the SIP or conformity determination.*

In this example, total Class 8 truck NO_x emissions projected using MOBILE6 for the nonattainment area in 2007 are 80 tons per day. The long duration idle portion of the 2007 inventory for this area is assumed to be not more than 3.4 percent of 80 tons per day = 2.7 tons per day. This is well over the estimated net reductions from this program of 171.9 pounds per day so full credit for the program can be taken, assuming all other requirements are met.

Appendix F

Example Quantification

Stationary Idle Reduction Technology

This example is for the purpose of illustrating the quantification steps only, and it does not address the additional considerations necessary to credit the reductions generated. In this example we will estimate the long duration NO_x idling emission reductions from an idling Class 8 truck using truck stop electrification (TSE). In this example, 100 truck stop parking spaces are electrified. On average these spaces (prior to electrification) are estimated to be used 10 hours per day in 2007 based on historic idling activity. This is the only long duration idle reduction project in the nonattainment area. Total Class 8 truck NO_x emissions projected for the area in 2007 are 80 tons per day.

Per the steps outlined in Section D of this document, the NO_x emission reductions from these electrified truck stop spaces is calculated as follows:

Step 1: *Determine the historic idling activity associated with the truck parking spaces involved in the project*.

You should follow the guidance provided in question 7(D)(2) above to derive the historic number of hours the trucks idled at the location for a typical summer weekday in the nonattainment area. For the purpose of this example, the estimated number of hours per day of idling documented is 10.

Step 2: *Select the emission factor for the criteria air pollutant or precursor.*

We are evaluating NO_x emission reductions so the emission factor is 135 grams per hour.

Step 3: *Multiply the emission factor in Step 2 by the number of hours per day the idle reduction technology is estimated to be used*.

We estimate that the TSE will reduce 8 of the 10 hours idling. Therefore, the average daily emissions reduced is 135 grams/hr * 8 hours/day = 1,080 grams per day or 2.37 pounds per day.

Steps 4, 5: *Determine emission factor for the mobile idle reduction technology*; *determine the net emission reduction*.

Since this example involves TSE, we presume that the electrical generation and emissions may slightly increase at local power plants and that all emissions from power plants (including any increase in demand resulting form an electrification project) will be accounted for in projections of, or limits on, overall power plant emissions in the state's attainment demonstration. Therefore, emission changes at power plants are not considered when quantifying the emission reductions associated with the TSE project. Therefore, you can skip steps 4 and 5 for this example.

Step 6: *Sum all emission reductions for the project.*

In this example, we assume that all trucks will use each electrified space in a similar manner. In practice, each electrified parking space could have its own idling emission reduction assessment. In this example, we add the total amount of idling for all participating trucks in 100 parking spaces which is 100 * 1,080 = 108,000 grams/day or 238 pounds per day.

Step 7: *Make sure the net average daily emission reductions from the idling reduction project do not exceed the historic idling activity of the trucks involved in the project as determined in Step 1.*

This step involves taking your estimate of idling activity (or the actual emission reduced) and reconciling this estimate (or actual number) with your historic idling hours from Step 1 (following question 7(D)(2)). If the estimate (or actual number) exceeds the historic idling hours, you will need to explain this increase if you seek credit for the estimated (or actual) amount. In this example, the estimate does not exceed the historic idling activity.

Step 8: *Make sure the net average daily emission reductions from all idling reduction projects do not exceed the total long duration idle emissions accounted for in the regional inventory used in the SIP or conformity determination.*

In this example, total Class 8 truck NO_x emissions projected using MOBILE6 in 2007 are 80 tons per day. The long duration idle portion of the 2007 inventory for this area is assumed to be not more than 3.4 percent of 80 tons per day = 2.7 tons per day. This is well over the estimated net reductions from this program of 238 pounds per day so full credit for the program can be taken.

NOTE: If both example projects as described in Appendix E and F were in place, the area would for Step 8 compare the long duration idle emissions of the SIP inventory and/or regional conformity analysis (in this case 2.7 tons per day) to the sum of the estimated emission reductions from the two programs = 171.9 pounds per day + 238 pounds per day = 410 pounds per day assuming that the trucks with APUs always park in non-electrified spaces. Again, the combined reductions from both programs is below 2.7 tons of NO_x per day for the year 2007. Even if the estimated benefits from all programs to reduce long duration idling in this area exceeded 2.7 tons per day, a maximum of 2.7 tons per day could only be claimed as credit in 2007.