California Environmental Protection Agency

Air Resources Board

PUBLIC MEETING AGENDA

July 23, 2009

LOCATION:
County Administration Center
Board Chambers, Room 310
1600 Pacific Highway
San Diego, California 92101

This facility is accessible by public transit. For transit information, call (619) 233-3004, website: http://www.sdmts.com
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July 23, 2009
9:00 a.m.

Agenda Item #

09-7-2: Public Meeting to Discuss the Climate Science Update (Overview of Haagen-Smit)

Staff will provide an overview of the 2009 Haagen-Smit Symposium entitled "Addressing the Missing Piece of California's Carbon Footprint: Non-Kyoto Pollutants, International Transport, and the Carbon Embedded in Imports." The symposium brought together policy-makers and researchers from California, the United States, and the international community to address that fraction of California's climate-forcing emissions that are not currently addressed by current mitigation programs.

09-7-4: Public Meeting to Update the Board on CalNex 2010 and Other Major Field Studies in California in 2010

ARB and the National Oceanic and Atmospheric Administration staff will update the Board on CalNex 2010, a major air quality and climate science field study, as well as other studies, which will take place in California in 2010.

09-7-7: Public Hearing to Consider Proposed Amendments to the Regulation for In-Use Off-Road Diesel-Fueled Fleets

Staff will propose amendments to implement changes to the regulation for in-use off-road diesel vehicles (off-road regulation). As part of the February 2009 State budget, Assembly Bill 8 2X, the ARB was directed to make several changes to the off-road regulation that will lessen its requirements for many large fleets in 2010 through 2012. Staff will also propose amendments to mitigate the potential loss in emission benefits resulting from these changes and propose amendments to clarify and correct minor inconsistencies in the regulation's exemption provisions. The off-road regulation was adopted by the Board on July 26, 2007.

09-7-6: Public Meeting to Consider a Status Report on the Zero-Emission Bus Regulation

The staff presentation will report on the delays in Z-Bus demonstrations, continued higher costs for Z-Buses as well as commercial readiness of fuel cell technology used in Z-Buses. Given the remaining challenges identified in staff's report, recommendations will also be made regarding possible amendments to the Z-Bus regulation. Staff will lay out suggestions for delay of the Z-Bus purchase requirement, the way the purchase requirement would be implemented and the role that transit buses may play in greenhouse gas emission reduction strategies. Staff will look to the Board for discussion and direction on a future rulemaking to amend the Z-Bus regulation.

CLOSED SESSION – LITIGATION

The Board will hold a closed session, as authorized by Government Code section 11126(e), to confer with, and receive advice from, its legal counsel regarding the following pending litigation:

Central Valley Chrysler-Jeep, Inc. et al. v. Goldstene, U.S. Court of Appeals, Ninth Circuit, No. 08-17378 on appeal from U.S. District Court (E.D. Cal. - Fresno).

Fresno Dodge, Inc. et al. v. California Air Resources Board et al., Superior Court of California (Fresno County), Case No. 04CE CG03498.

General Motors Corp. et al. v. California Air Resources Board et al., Superior Court of California (Fresno County), Case No. 05CE CG02787.

State of California by and through Arnold Schwarzenegger, the California Air Resources Board, and the Attorney General v. U.S. Environmental Protection Agency, and Stephen L. Johnson, Administrator, U.S. Court of Appeals, District of Columbia Circuit, Case No. 08-1178.

California Business Properties Association, et al. v. California Air Resources Board, et al., Superior Court of California (Sacramento), Case No. 34-2009-80000232.

Green Mountain Chrysler-Plymouth-Dodge-Jeep, et al. v. Crombie, 508 F.Supp.2d 295, U.S. District Court Vermont (2007), appeal to U.S. Court of Appeals, Second Circuit, Nos. 07-4342-cv(L) and 07-4360-cv(CON).

Pacific Merchant Shipping Association v. Goldstene, U.S. District Court, EDCA, Case No. 2:09-CV-01151-MCE-EFB.

American Trucking Association, et al. v. U.S. Environmental Protection Agency, et al., U.S. Court of Appeals, District of Columbia Circuit, Case No. 09-1090.

OPPORTUNITY FOR MEMBERS OF THE BOARD TO COMMENT ON MATTERS OF INTEREST

Board members may identify matters they would like to have noticed for consideration at future meetings and comment on topics of interest; no formal action on these topics will be taken without further notice.

OPEN SESSION TO PROVIDE AN OPPORTUNITY FOR MEMBERS OF THE PUBLIC TO ADDRESS THE BOARD ON SUBJECT MATTERS WITHIN THE JURISDICTION OF THE BOARD

Although no formal Board action may be taken, the Board is allowing an opportunity to interested members of the public to address the Board on items of interest that are within the Board's jurisdiction, but do not specifically appear on the agenda. Each person will be allowed a maximum of three minutes to ensure that everyone has a chance to speak.

THE AGENDA ITEMS LISTED ABOVE MAY BE CONSIDERED IN A DIFFERENT ORDER AT THE BOARD MEETING.

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IF YOU HAVE ANY QUESTIONS, PLEASE CONTACT THE CLERK OF THE BOARD:
OFFICE: (916) 322-5594
1001 I Street, Floor 23, Sacramento, California 95814
ARB Homepage: www.arb.ca.gov

To request special accommodation or language needs, please contact the following:

If you require special accommodations or language needs, please contact the Clerk of the Board at (916) 322-5594 or by facsimile at (916) 322-3928 as soon as possible, but no later than 10 business days before the scheduled Board hearing. TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

SMOKING IS NOT PERMITTED AT MEETINGS OF THE CALIFORNIA AIR RESOURCES BOARD

California Environmental Protection Agency

Air Resources Board

PUBLIC MEETING AGENDA

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TITLE 13. CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC HEARING TO CONSIDER PROPOSED AMENDMENTS TO THE REGULATION FOR IN-USE OFF-ROAD DIESEL-FUELED FLEETS

The Air Resources Board (ARB or the Board) will conduct a public hearing at the time and place noted below to consider adopting amendments to its regulation for In-Use Off-Road Diesel-Fueled Fleets, California Code of Regulations (Cal. Code Regs.), title 13, sections 2449 through 2449.3 to address, among other things, the directives set forth in the recently adopted California budget Assembly Bill (AB 8 2X). This notice summarizes the specific amendments being proposed. The staff report (Initial Statement of Reasons) presents the proposed amendments and information supporting the adoption of the amendments in greater detail.

DATE: July 23, 2009

TIME: 9:00 a.m.

PLACE: County Administration Center
1600 Pacific Highway
Board Chambers, Room 310
San Diego, California 92101

This item will be considered at a one-day meeting of the Board, which will commence at 9:00 a.m., July 23, 2009. Please consult the agenda for the meeting, which will be available at least 10 days before July 23, 2008, to determine the order of agenda items.

If you require special accommodations or language needs, please contact the Clerk of the Board at (916) 322-5594 or by facsimile at (916) 322-3928 as soon as possible, but no later than 10 business days before the scheduled Board hearing. TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

INFORMATIVE DIGEST OF PROPOSED ACTION AND POLICY STATEMENT OVERVIEW

Sections Affected: Proposed amendments to California Code of Regulations, title 13, sections 2449(c), 2449(c)(26), 2449(c)(38), 2449(e)(6), 2449(e)(8), 2449(g), 2449(h), 2449.1(a)(2)(A), 2449.1(a)(2)(A)2.a., 2449.2(a)(2)(A), and 2449.2(a)(2)(A)2.a., the regulation for In-Use Off-Road Diesel-Fueled Fleets (off-road regulation).

Background:

At its July 26, 2007, public hearing, the Air Resources Board (Board or ARB) approved the regulation for In-Use Off-Road Diesel-Fueled Fleets (the off-road regulation) with the adoption of California Code of Regulations, title 13, sections 2449 through 2449.3. The off-road regulation is intended to significantly reduce emissions of diesel particulate

matter (PM) and oxides of nitrogen (NOx) from the nearly 180,000 off-road diesel vehicles that operate in California. The reductions are necessary to meet State and federal air quality standards and support the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles, which was adopted by the Board on September 30, 2000. To achieve the required reductions, the off-road regulation requires fleet owners to accelerate turnover to cleaner engines and install exhaust retrofits.

On December 12, 2008, the Board approved two minor amendments to the off-road regulation as part of the rulemaking that considered adoption of the Regulation for In-Use On-Road Diesel Vehicles. The amendments to the off-road regulation clarified the regulation's low-use provisions and expanded coverage of the regulation to include both the propulsion and auxiliary engines of two engine cranes.

On January 22, 2009, the Board approved several additional amendments to the off-road regulation. First, it extended the deadline for fleet owners to obtain double PM credits for installing exhaust retrofits. The deadline was extended by ten months to January 1, 2010. The extension will also allow fleets to obtain double credits if they order retrofits by September 1, 2009, but cannot install them by January 1, 2010, because of manufacturer delays. The extension provides fleets with additional time to accrue double PM retrofit credits, which will facilitate later compliance. The Board also approved several other minor modifications and clarifications to the regulation.

Applicability

The fleet requirements of the off-road regulation apply to any person, business, or government agency who owns or operates within California any diesel-fueled or alternative diesel fueled off-road compression ignition vehicle engine with maximum power of 25 horsepower (hp) or greater that is used to provide motive power in a workover rig or to provide motive power in any other motor vehicle that (1) cannot be registered and driven safely on-road or was not designed to be driven on-road, and (2) is not an implement of husbandry or recreational off-highway vehicle. With the exception of two-engine cranes, the regulation only addresses engines that propel vehicles (i.e., it does not apply to stationary equipment or portable equipment like generators).

Fleet Requirements

In general, the off-road regulation requires owners to modernize their fleets by replacing engines with newer, cleaner ones (repowering), replacing vehicles with newer vehicles equipped with cleaner engines, retiring older vehicles, operating higher emitting vehicles less often (designating them as low-use vehicles) or by applying exhaust retrofits that capture and destroy pollutants before they are emitted into the atmosphere. The regulation determines the date of compliance and the actions required based on the size of the fleet, splitting fleets into three categories: large fleets with over 5,000

horsepower, medium fleets with 2,501 to 5,000 horsepower, and small fleets with 2,500 horsepower or less.

Performance requirements must be met by March 1 of each year, as follows:

- Large fleets: 2010-2020
- Medium fleets: 2013-2020
- Small fleets: 2015-2025

To meet the PM and NOx emission reduction requirements, fleets[1] have the option of meeting fleet average emissions targets, or meeting the Best Available Control Technology (BACT) requirements. The PM BACT requirements consist of installing retrofits that have been approved by ARB as verified diesel emission control strategies (VDECS) on 20 percent of their maximum horsepower in each year of compliance. To meet the NOx BACT requirements, large and medium fleets must turnover eight percent of their maximum horsepower in each year of compliance until 2015, after which there is a 10 percent turnover requirement.

To encourage fleets to take early actions to reduce emissions and to allow fleets to spread out the cost of compliance during the early years of the regulation, the off-road regulation provided fleets with credits for taking the following early compliance actions before March 1, 2009:

- Repowering vehicles, including replacing Tier 0 engines with Tier 1 engines;
- Retiring Tier 0 vehicles at an average rate greater than 8 percent of total fleet horsepower per year during the period from March 1, 2006 to March 1, 2009; and
- Installing VDECS that have been verified as achieving NOx reductions on their vehicles.

Legislatively Directed Changes

As part of the recently signed California budget, the California Legislature in AB 8 2X, codified at Health and Safety Code section 43018.2, directed ARB to make several changes to the regulation as set forth below. Although the changes will allow some fleets to delay compliance, the directives of AB 8 2X do not repeal or delay general implementation of the off-road regulation. The directives include:

1. Fleets that experience reduced activity of their off-road vehicles between July 1, 2007 and March 1, 2010, may take credit for this reduced fleet activity to satisfy the turnover and retrofitting requirements of the regulation in 2010 and 2011.

2. Fleets will be given credit (for both PM and NOx) for any vehicle retirements made between March 1, 2006, and March 1, 2010, provided that total fleet horsepower has decreased.

[1] Large and medium fleets have to meet both the PM and NOx performance requirements. Small fleets are only required to meet the diesel PM requirements.

3. For the total cumulative turnover and retrofit requirements for the years 2011 through 2013, fleets may complete 20 percent of those requirements by March 1, 2011, an additional 20 percent by March 1, 2012, and the balance by March 1, 2013.

Because the legislatively directed changes will lessen the requirements for many large fleets in the early years of the regulation, without mitigation, the changes could result in:

- A loss in emission reductions that were anticipated to be achieved in 2014 (a key milestone year for the State Implementation Plan).
- A reduction in forecasted health benefits.
- A severe economic impact on retrofit manufacturers and installers that have invested in the anticipation of implementation of the off-road regulation, which could adversely impact the ability of that industry to have product available for compliance in future years, as well as a potentially significant loss of "green" jobs.

Therefore, to address the Legislature's directives and potential impacts that could result, staff is proposing that the Board approve the amendments set forth and explained below for adoption.

Description of Proposed Regulatory Action

The first section below describes the AB 8 2X legislatively directed changes. The next section describes new provisions staff is proposing to add to the regulation to offset the loss in emission benefits due to the legislatively directed changes. The final section describes some minor modifications and clarifications to the off-road regulation.

Legislatively Directed Changes

Revised BACT Schedule

Staff proposes to amend sections 2449.1(a)(2)(A) and 2449.2(a)(2)(A) to add a provision to allow a fleet to achieve its cumulative turnover and retrofit requirements for the years 2011 to 2013, inclusive, by completing 20 percent of its cumulative turnover and retrofit obligations in 2011, an additional 20 percent in 2012, and the balance in 2013. This change would allow large fleets the option to defer a portion of the turnover and retrofits otherwise required in 2011 and 2012 to 2013, and result in a reduction of capital outlays in 2011 and 2012. Table 1 shows the existing regulatory provisions and the proposed revised BACT schedule.

Table 1: Revised BACT Schedule
(Percent turnover required / Percent retrofit required)

	2010	2011	2012	2013	2014
Existing	8 / 20	8 / 20	8 / 20	8 / 20	8 / 20
Proposed Option	8 / 20	4.8 / 12	4.8 / 12	14.4 / 36	8 / 20

Staff also proposes to include a provision that would apply to all medium fleets and to large fleets that meet the NOx and PM fleet average targets in 2011 or 2012. Staff proposes to adjust the required BACT percentages for such fleets to ensure that the revised schedule does not increase the BACT requirements beyond what the current regulation requires. This is necessary because many fleets have already developed their compliance plans for the regulation and giving a fleet less credit than they were expecting would disrupt those plans.

Credit for Reduced Activity

Staff proposes to amend sections 2449.1(a)(2)(A)2.a. and 2449.2(a)(2)(A)2.a. to add provisions that would allow fleets to claim credit for reduced activity between July 1, 2007 and March 1, 2010. The new provisions specify that the new reduced activity credit may be used by fleets to satisfy their NOx and PM BACT requirements but will only be applicable towards the March 1, 2010 and March 1, 2011 compliance dates.

Staff also proposes to amend section 2449(g) to require reporting of information for those fleets claiming reduced activity credit. Staff also proposes to amend section 2449(h) to add the recordkeeping requirements associated with claiming the new reduced activity credit.

Staff proposes to determine reduced activity by comparing activity during the period January 1, 2007, to December 31, 2007 (centered on July 1, 2007, the date specified in AB 8 2X) to the activity during the period March 1, 2009 to February 28, 2010. Therefore, the activity reduction would be the percent reduction in horsepower hours (hp-hours) activity from the initial period (January 1, 2007 - December 31, 2007) to the later period (March 1, 2009 - February 28, 2010).

This new reduced activity credit would allow some large fleets to reduce or completely eliminate the need for compliance action in 2010 and 2011, delaying action until later years. The new credit would primarily benefit those fleets that have experienced the greatest reduction in activity since 2007.

Additional Credit for Vehicle Retirement

Staff also proposes to amend sections 2449.1(a)(2)(A)2.a. and 2449.2(a)(2)(A)2.a. to add provisions to allow fleets to claim credit for vehicle retirements that reduce total fleet horsepower between March 1, 2006, and March 1, 2010. The new provisions specify that the new retirement credit could be used by fleets to satisfy their NOx and PM BACT requirements. Staff also proposes to amend section 2449(g) to require fleets that claim the proposed retirement credit to report specific information in support of their claims. Finally, staff proposes to amend section 2449(h) to add the recordkeeping requirements associated with claiming the new retirement credit.

As with the reduced activity credit, the retirement credit would allow some large fleets to reduce or completely eliminate the need to take compliance actions in the early years of the regulation and would primarily benefit those fleets that have significantly downsized since 2006. Because the new credits do not expire, they may be banked and used by fleets for many years and thus could assist some medium and small fleets as well.

Fleets that have retired vehicles and also have reduced activity from the remaining vehicles in the fleet may claim credit for both the retired vehicles and for the reduced activity related to the non-retired vehicles in the fleet. However, a fleet may not double count retired vehicles (i.e., receive credit for retiring and reduced activity for the same vehicle) and reduced activity from those retired vehicles.

<u>New Provisions to Mitigate Loss in Emission Benefits</u>

Staff is proposing three specific measures to offset the loss in emission benefits due to the legislatively directed changes.

Exempt Vehicles that are Retrofit Early from Future Turnover

Staff proposes to amend section 2449.1(a)(2)(A)4. to allow fleets to claim a limited exemption from future turnover if they install a highest level PM VDECS prior to March 1, 2011. This credit could potentially provide an incentive for fleets to install retrofits and achieve immediate PM reductions earlier than they otherwise would. This change would be purely voluntary, so it would impose no additional requirements on fleets. Staff is proposing to limit the exemption by capping the number of vehicles for which a fleet can claim the exemption; this would effectively mitigate potential long-term effects.

Double Credit for NOx Retrofits

Staff is similarly proposing to amend section 2449.1(a)(2)(A)2.a. to add a provision to allow fleets to claim double credit for NOx retrofits installed by March 1, 2011. Staff recommends this double credit because it could help mitigate the potential loss in NOx emission reductions from the legislatively-directed changes by providing an incentive for early NOx reductions. This change would be voluntary as well, so it would also not impose any additional requirements on fleets.

Repower Credit

Staff proposes to amend section 2449.1(a)(2)(A)2.b. to add a provision to allow fleets to accumulate NOx carryover turnover credit for repowers installed, even if such repowers do not exceed 8 percent of its total fleet horsepower. This change is intended to encourage large fleets to pursue repowers in 2010 and 2011 even if the new credits would otherwise allow them to comply in those years with no additional turnover, as well as to encourage medium fleets to pursue repowering in the years prior to their 2013 initial compliance date.

Extended Double Retrofit Credit for Small and Medium Fleets

Staff proposes to amend section 2449.1(a)(2)(A)2.a.ii., to provide double PM credit for small and medium fleets that install highest level VDECS on their vehicles prior to March 1, 2012. The double PM credit could be used by fleets to satisfy their PM BACT requirements in future years. This credit could potentially provide an incentive for small and medium fleets to install retrofits and achieve PM reductions earlier than they otherwise would. Taking advantage of this new double credit would be voluntary as well, so it would also not impose any additional requirements on fleets.

Other Minor Clarifications and Modifications

Staff is proposing several minor clarifications and modifications to the regulation, including the following:

Compliance Extension for Installer Delays

Staff is proposing to amend section 2449(e)(6) to clarify that the section applies to installer delays as well as manufacturer delays, both of which are beyond the fleet owner's control. Hence, a fleet owner who has purchased an engine or VDECS in order to comply with this regulation, will be excused from immediate compliance if the engine or VDECS is not been installed in time due to installer delays as long as the engine or VDECS was purchased at least four months prior to the compliance date.

Including Community College Training Programs as Non-Profit Training Centers

Staff is proposing to amend the definition of Non-Profit Training Center in section 2449(c)(38) to include community college programs that train students in the use of off-road vehicles. Currently, the definition in section 2449(c)(38) applies only to entities qualifying as a non profit or not for profit organization under title 26 Internal Revenue Code section 501(a), (c)(3), (c)(5), or (c)(6). Since adoption of the regulation, staff has learned that community colleges run similar training programs to those included in the current definition of Non-Profit Training Center but that these programs do not meet the non profit or not for profit Internal Revenue Code definitions above. Per the definition of small fleet in section 2449(c)(25), Non-Profit Training Center fleets are considered small

fleets and therefore are provided more time to comply with the PM requirements while also being exempt from the NOx provisions, regardless of their total horsepower. Staff believes that community college training programs should be extended this flexibility for the same reason it was extended to other non-profit training centers, namely that they have little opportunity to raise the money needed to pay for compliance, and that their equipment is relatively low-use.

VDECS That Impairs Safe Operation of Vehicle

Staff is proposing to amend section 2449(e)(8) to clarify that a retrofit installation may be determined unsafe if it would make compliance with any federal or State agency safety requirements impossible. Fleet owners may currently request that the Executive Officer find that a VDECS should not be considered the highest level VDECS available because its use would make compliance with occupational safety and health requirements, mining safety and health requirements, or an ongoing local air district permit condition, impossible. However, staff would like to clarify that fleets may also make that same request if use of a VDECS would conflict with any other federal or State agency safety requirements. For example, if use of a VDECS would cause a ground support equipment fleet at an airport to be unable to meet Federal Aviation Administration (FAA) safety requirements, the fleet could request that the VDECS not be considered highest level VDECS.

Definition of Forest Operations

Staff is proposing to amend section 2449(c)(26) to clarify that public agency fire prevention activities are classified as forest operations. Thus, vehicles used solely for such activities are considered to be used for agricultural operations and are exempt from the off-road regulation. Currently, such activities (which include installing fuel breaks, firebreaks, and fire hazard abatement) are defined as forest operations if they are "for commercial purposes." However, if such activities are undertaken by a public agency, they currently do not meet the definition. To provide equity and to avoid discouraging public agencies from undertaking fire prevention, staff proposes to expand the definition of forest operations to include such activities, whether they are performed by a public agency or private entity.

Reporting Vehicle Sales

Staff is proposing to amend section 2449(g) to clarify that fleets must report to ARB within 30 days of selling a vehicle. Section 2449(f)(1) already requires that fleets report within 30 days of purchasing a vehicle or bringing it into California. To enable fleets to cleanly add vehicles that they have purchased from another fleet and for the vehicles to maintain their Equipment Identification Numbers, it is also necessary for fleets to report sales in the same time frame.

COMPARABLE FEDERAL REGULATIONS

The U.S. Environmental Protection Agency (U.S. EPA) has promulgated federal emission standards for new non-road engines. However, no federal standards have been promulgated addressing emission reductions from in-use diesel vehicle engines.

Under section 209(e)(2), California may adopt and enforce emission standards and other requirements for off-road engines and equipment not expressly subject to federal preemption, so long as California applies for and receives authorization from the Administrator of U.S. EPA. California's request for authorization was submitted on August 12, 2008, and on October 27, 2008, the U.S. EPA conducted a hearing regarding California's request for authorization for the off-road regulation; the request is presently pending.

AVAILABILITY OF DOCUMENTS AND AGENCY CONTACT PERSONS

The Board staff has prepared a Staff Report: Initial Statement of Reasons (ISOR) for the proposed regulatory action, which includes a summary of the economic and environmental impacts of the proposal. The report is entitled: "Proposed Amendments to the Regulation for In-Use Off-Road Diesel Vehicles."

Copies of the ISOR and the full text of the proposed regulatory language, in underline and strikeout format to allow for comparison with the existing regulations, may be accessed on ARB's website listed below, or may be obtained from the Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, First Floor, Sacramento, California, 95814, (916) 322-2990 at least 45 days prior to the scheduled hearing on July 23, 2009.

Upon its completion, the Final Statement of Reasons (FSOR) will be available and copies may be requested from the agency contact persons in this notice, or may be accessed on ARB's website listed below.

Inquiries concerning the substance of the proposed regulation may be directed to Ms. Kim Heroy-Rogalski, Manager of the Off-road Implementation Section at (916) 327-2200, or Ms. Beth White, Air Pollution Specialist, at (916) 324-1704.

Further, the agency representative and designated back-up contact persons to whom nonsubstantive inquiries concerning the proposed administrative action may be directed are Ms. Lori Andreoni, Manager, Board Administration and Regulatory Coordination Unit, (916) 322-4011, or Ms. Amy Whiting, Regulations Coordinator (916) 322-6533. The Board has compiled a record for this rulemaking action, which includes all the information upon which the proposal is based. This material is available for inspection upon request to the contact persons.

This notice, the ISOR and all subsequent regulatory documents, including the FSOR, when completed, are available on ARB website for this rulemaking at www.arb.ca.gov/regact/2009/offroad09/offroad09.htm

COSTS TO PUBLIC AGENCIES AND TO BUSINESSES AND PERSONS AFFECTED

Costs to State Government and Local Agencies

Pursuant to Government Code sections 11346.5(a)(5) and 11346.5(a)(6), the Executive Officer has prepared an estimate in accordance with instructions adopted by the Department of Finance, and determined that the proposed regulatory action would not create overall costs or savings to any State agency or in federal funding to the State, costs or mandate to any local agency or school district whether or not reimbursable by the State pursuant to Government Code, title 2, division 4, part 7 (commencing with section 17500), or other nondiscretionary cost or savings to State or local agencies.

The proposed modifications to provide additional early credit to fleets that have decreased in total horsepower or have reduced fleet activity would provide fleets with the opportunity to delay their initial compliance costs, without increasing the total cost of the regulation. Public fleets that have experienced drastic reductions in activity or fleet size may be able to avoid any compliance actions in 2010 and 2011. The ability to delay initial compliance costs could benefit the State, federal, and larger municipal fleets whose first compliance date is March 1, 2010, more than local municipalities that are small or medium fleets, because the new reduced activity credits expire after 2011.

Additionally, the revised schedules for BACT would reduce the turnover and retrofitting requirements in 2011 and 2012 for large public fleets, requiring them to take fewer compliance actions in those years thereby delaying some of their compliance costs until 2013. Although the proposed modifications would require an increase in fleet turnover and retrofitting in 2013, the cumulative amount of turnover and retrofitting required between 2011 and 2013 will not increase or decrease from the costs identified at the time of initial adoption of the off-road regulation. Therefore, the revised BACT schedule will not increase the cost of the regulation. Instead, it may slightly decrease costs by allowing fleets to defer compliance costs to later years using later year dollars (i.e., the present value of their compliance costs will be lower).

Finally, some cost savings are expected for public agencies that off-road vehicles that perform fire prevention activities.

Effect on Private Persons and Businesses

Pursuant to Government Code section 11346.5(a)(9), ARB has evaluated the potential economic impacts on representative private persons or businesses and the Executive Officer has determined that a representative private person and business would incur minimal, if any, cost impacts because of the proposed amendments.

As discussed above for public fleets, the proposed modifications to provide additional early credit to fleets that have decreased in total horsepower or have reduced fleet activity would allow some fleets to delay their initial compliance costs, without imposing

any additional costs on them. Large fleets that have experienced drastic reductions in activity or fleet size may be able to defer any compliance actions in 2010 and 2011. Additionally, the revised BACT schedule is not expected to result in any additional costs on business overall because the cumulative amount of turnover and retrofitting required between 2011 and 2013 would not change. Instead, it may slightly decrease costs by allowing fleets to defer compliance costs to later years using later year dollars (i.e., the present value of their compliance costs will be lower). The Executive Officer has also determined, pursuant to California Code of Regulations, title 1, section 4, that the proposed regulatory action may affect small businesses. However, the proposed amendments will not impose any additional costs on small businesses, and instead may benefit them by allowing them to spread out or lower their compliance costs.

Effect on State Economy

Pursuant to Government Code section 11346.5(a)(8), the Executive Officer has made an initial determination that the proposed regulatory action would not have a significant Statewide adverse economic impact directly affecting businesses, including the ability of California businesses to compete with businesses in other states. In accordance with Government Code sections 11346.5(a)(10) and 11346.3(b), the Executive Officer has further determined that the proposed regulatory action may decrease the elimination of jobs within the State of California, and decrease the elimination of existing businesses within the State of California.

The proposed legislatively directed modifications would reduce the compliance obligations for many fleets and businesses affected by the off-road regulation in 2010 and 2011, mitigating the effects of the current economic downturn. These modifications could also lead to a negative economic impact on retrofit manufacturers and installers and firms that provide repowers because they would receive fewer orders in the next few years. However, the provisions within the proposed modifications intended to encourage early retrofitting and repowering would help protect such retrofit and repower jobs and businesses.

A detailed assessment of the economic impacts of the proposed regulatory action and its effect on California businesses can be found in the ISOR.

Consideration of Alternatives

Before taking final action on the proposed regulatory action, the Board must determine that no reasonable alternative considered by the Board, or that has otherwise been identified and brought to the attention of the Board would be more effective in carrying out the purpose for which the action is proposed or would be as effective and less burdensome to affected private persons than the proposed action. Alternatives that have been considered by staff are discussed in the ISOR.

SUBMITTAL OF COMMENTS REGARDING PROPOSED REGULATORY ACTION

The public may present comments relating to the proposed amendments orally or in writing at the hearing, and in writing or by email before the hearing. To be considered by the Board, written submissions not physically submitted at the hearing must be received **no later than 12:00 noon, July 22, 2009,** and addressed to the following:

Postal mail:	Clerk of the Board, Air Resources Board 1001 I Street, Sacramento, California 95814
Electronic submittal:	http://www.arb.ca.gov/lispub/comm/bclist.php
Facsimile submittal:	(916) 322-3928

Please note that under the California Public Records Act (Government Code section 6250 et seq.), your written and oral comments, attachments, and associated contact information (e.g., your address, phone, email, etc.) become part of the public record and can be released to the public upon request. Additionally, this information may become available via Google, Yahoo, and any other search engines.

The Board requests but does not require that 30 copies of any written statement be submitted and that all written statements be filed at least 10 days prior to the hearing so that ARB staff and Board members have time to fully consider each comment. The board encourages members of the public to bring to the attention of staff in advance of the hearing any suggestions for modification of the proposed regulatory action.

STATUTORY AUTHORITY AND REFERENCES

This regulatory action is proposed under the authority granted in Health and Safety Code (HSC) sections 39600, 39601, 39602.5, 39667, 43013, 43018, and 43018.2. This action is proposed to implement, interpret, and make specific sections 2449, 2449.1, and 2449.2, title 13, California Code of Regulations.

HEARING PROCEDURES

The public hearing will be conducted in accordance with the California Administrative Procedure Act, title 2, division 3, part 1, chapter 3.5 (commencing with section 11340) of the Government Code.

Following the public hearing, the Board may adopt the regulatory amendments as originally proposed, or with non substantial or grammatical modifications. The Board may also adopt the proposed regulatory language with other modifications if the text as modified is sufficiently related to the originally proposed text that the public was adequately placed on notice that the regulatory language as modified could result from the proposed regulatory action; in such event the full regulatory text, with the

modifications clearly indicated, will be made available to the public, for written comment, at least 15 days before it is adopted.

The public may request a copy of the modified regulatory text from the ARB's Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, First Floor, Sacramento, California, 95814, (916) 322-2990.

At the Board meeting, the Board may direct staff to develop additional modifications to the regulation to be considered at a later Board hearing. If directed to do so, ARB will prepare a separate notice of proposed rulemaking that will be published not less than 45 days before the scheduled hearing date.

CALIFORNIA AIR RESOURCES BOARD

James N. Goldstene
Executive Officer

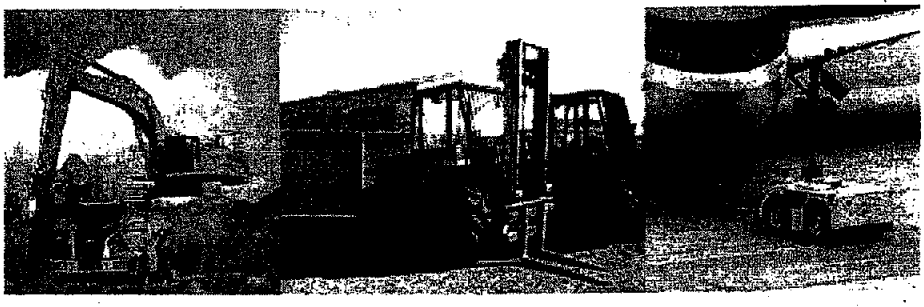
Date: May 26, 2009

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website at www.arb.ca.gov.

California Environmental Protection Agency
AIR RESOURCES BOARD

STAFF REPORT: INITIAL STATEMENT OF REASONS FOR PROPOSED RULEMAKING

PROPOSED AMENDMENTS TO THE REGULATION FOR IN-USE OFF-ROAD DIESEL-FUELED FLEETS



Mobile Source Control Division
Heavy Duty Diesel In-Use Strategies Branch

June 2009

State of California
AIR RESOURCES BOARD

STAFF REPORT: INITIAL STATEMENT OF REASONS

Public Hearing to Consider

PROPOSED AMENDMENTS TO THE REGULATION FOR IN-USE OFF-ROAD DIESEL-FUELED FLEETS

To be considered by the Air Resources Board at a meeting of the Board that will commence on July 23, 2009, at

San Diego, California

Mobile Source Control Division:
Robert Cross, Chief

Heavy-Duty Diesel In-Use Strategies Branch:
Erik White, Chief

Off-Road Implementation Section:
Kim Heroy-Rogalski, Manager

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State of California
AIR RESOURCES BOARD

PROPOSED AMENDMENTS TO THE REGULATION FOR IN-USE OFF-ROAD DIESEL-FUELED FLEETS

Contributing Authors

Elizabeth White
Cory Parmer
Elizabeth Yura
Michael Baker
Jeff Wilson

Legal Counsel

Michael Terris, Office of Legal Affairs

Supporting Division

Planning and Technical Support Division

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EXECUTIVE SUMMARY

What is the purpose of this report?

As part of the recently signed California budget, the California Legislature adopted Assembly Bill 8 2X (Assembly Bill 8 2X or AB 8 2X), which added section 43018.2 to the Health and Safety Code. In AB 8 2X, the Legislature directed ARB to make several amendments to the California Code of Regulations, Title 13, sections 2449 through 2449.3, the regulation for in-use off-road diesel fueled-fleets (the regulation). This report describes staff's proposal to implement the legislatively directed amendments, as well as proposed new incentives to spur early actions by fleets to reduce emissions, and several additional minor modifications and clarifications to the regulation.

What did the legislature direct ARB to do and why?

The intent of AB 8 2X, is to provide economic relief and to preserve jobs in the construction industry, which is currently facing difficult economic times due to the current global recession (Assembly, 2008; Senate, 2008). Once implemented, it would provide credits to fleets that have experienced drops in operational activity of their vehicles and/or that have reduced their fleet size by selling or retiring vehicles without acquiring replacements in the past three years. Under the legislatively-directed amendments, fleets would receive credits that could be used for compliance with the regulation's in-use performance requirements, and effectively allow such fleets to delay the need to retrofit and turnover vehicles, especially in 2010 and 2011. The amendments would also allow large fleets the option of delaying a portion of their compliance obligations that are currently required for 2011 and 2012 until 2013.

Specifically, AB 8 2X directs ARB to amend the regulation as follows:

1. For the total cumulative turnover and retrofit requirements for the years 2011 through 2013, to allow fleets to complete 20 percent of those requirements by March 1, 2011, an additional 20 percent by March 1, 2012, and the balance by March 1, 2013.

2. To allow fleets to receive compliance credit for both particulate matter (PM) and oxides of nitrogen (NOx) for any vehicle retirements made between March 1, 2006, and March 1, 2010, provided that total fleet horsepower has decreased.

3. To allow fleets that experience reduced activity of their off-road vehicles between July 1, 2007 and March 1, 2010 (i.e., operate their vehicle less), to receive credit for this reduced fleet activity to satisfy the turnover and retrofitting requirements of the regulation in 2010 and 2011.

The full language of AB 8 2X is included as Appendix A to this report.

What amendments to the regulation is staff proposing in response to the legislature's direction?

Staff's proposal for implementing AB 8 2X is summarized below.

First, staff proposes to allow fleets complying via the Best Available Control Technology (BACT) provisions to take fewer actions to meet the regulation's 2011 and 2012 compliance dates, but such fleets would need to make up for the difference by the 2013 compliance date. The BACT provisions allow fleets that do not meet the regulation's annual fleet average targets to alternatively comply by meeting specified turnover and retrofit requirements. Staff proposes to revise the BACT schedule to lessen the number of required vehicle turnovers and retrofits required in 2011 and 2012, as shown in Table 1 below. The turnover and retrofit requirements in 2011 and 2012 would be cut nearly in half, but if fleets take advantage of the new decreased requirements, they would need to make up for the delayed actions in 2013.

Table 1: Proposed Revised BACT Schedule
(Percent turnover required / Percent retrofit required)

Regulation	2010	2011	2012	2013	2014
Current	8 / 20	8 / 20	8 / 20	8 / 20	8 / 20
Proposed	8 / 20	4.8 / 12	4.8 / 12	14.4 / 36	8 / 20

Staff also proposes to adjust the required BACT percentages for all medium fleets and large fleets that are able to meet the fleet average targets in 2011 or 2012 to ensure that the revised schedule never increases the BACT requirements beyond what the current regulation requires for any fleet. The revised BACT percentages for such fleets are shown in Table 2 below.

Table 2: Proposed Revised BACT Schedule for Large Fleets meeting the Fleet Averages
(Percent turnover required / Percent retrofit required)

Regulation	2010	2011	2012	2013	2014
Meeting the Fleet Average in 2011	-	-	4.8 / 12	11.2 / 28	8 / 20
Meeting the Fleet Average in 2012 & Medium Fleets	-	-	-	8 / 20	8 / 20

Second, staff proposes to add provisions to allow fleets to claim credit for any vehicle retirements that reduce total fleet horsepower (hp) between March 1, 2006, and March

1, 2010. The new provisions would provide that the new retirement credit could be used by fleets to satisfy their NOx and PM BACT requirements and that the new credit would not expire.

Third, staff proposes to allow fleets to claim credit for reduced operational activity between July 1, 2007, and March 1, 2010. The reduced activity credit could be used by fleets to satisfy their NOx and PM BACT requirements in the years 2010 and 2011 only. Staff proposes to determine reduced activity by comparing activity during the period January 1, 2007, through December 31, 2007 (centered on July 1, 2007, the date specified in AB 8 2X) to the activity during the period March 1, 2009, to February 28, 2010. Staff proposes to use horsepower-hours (work done by one horsepower in one hour) to determine activity, which is more reflective of emissions than simply using hours. Additionally, staff proposes that fleets report their reduced activity and that there be more stringent records required for fleets that claim more than a 20 percent reduction in activity as follows:

- To receive credit up to 20 percent, a fleet would be required to produce verifiable records that show reduced fleet operational activity between the required time periods. Acceptable records include, but are not limited to, employment records (including man-hours worked), revenue records, taxes, operation records, and fuel use;
- To receive credit greater than 20 percent, a fleet would be required to submit hour-meter or operator logs for each vehicle.

Under the proposal, fleets that have retired vehicles and also have reduced activity from the remaining vehicles in the fleet could claim credit for both. However, staff is proposing provisions to prevent double counting of the same action (i.e., receiving credit both for retiring and reducing activity for the same vehicle).

Why are the emission reductions from the regulation important for the State Implementation Plan (SIP) and for public health in California?

As explained below, the emission reductions anticipated from the regulation are important from a public health standpoint and needed for the state to meet its federal SIP commitments. Because of this importance, when crafting the proposed amendments, staff included proposals to minimize the loss of emission benefits.

The off-road vehicles covered by the regulation are a significant source of diesel PM and NOx emissions that lead to ozone and ambient PM. Staff estimates that approximately 1,100 premature deaths were associated with the baseline uncontrolled emissions from in-use off-road diesel vehicles in year 2005.

The regulation was adopted in order to achieve significant emission reductions and protect public health. At the time the Board initially approved the regulation, staff estimated that approximately 4,000 premature deaths statewide would be avoided by the year 2030 by implementing the adopted regulation, in addition to preventing thousands of hospital admissions and asthma and bronchitis cases (ARB, 2007b).

Under the federal Clean Air Act (CAA), the U.S. Environmental Protection Agency (U.S. EPA) has established National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health, including PM2.5. Set to protect public health, the NAAQS are adopted based on a review of health studies by experts and a public process. Areas in the state that exceed the NAAQS are required by federal law to develop SIPs demonstrating how they would attain and maintain the standards by certain deadlines. If the state fails to make this demonstration, it can be subject to sanctions, including the loss of federal highway funds.

In order to meet the PM2.5 standard in the South Coast and the San Joaquin Valley Air Basins, by 2015, reductions of NOx on the order of 50 percent are needed. Reductions of NOx of 80-90 percent by 2023 will be needed to achieve the 8-hour ozone standard in the South Coast and San Joaquin Valley. Clearly, with this magnitude of reductions needed, the maximum level of potential emission reductions from all sources, including in-use off-road diesel vehicles are critically needed.

California's 2007 SIP included the regulation as a control measure. ARB's legal commitment to achieve the emission reductions laid out in the SIP relies upon the following emission reductions from the regulation by 2014 - 10.5 tpd NOx reductions and 2.6 tpd PM2.5 reductions in the South Coast, and 3.7 tpd NOx and 0.8 tpd PM2.5 reductions in the San Joaquin Valley (ARB, 2007c). If the regulation falls short of achieving these reductions, the loss would need to be made up for by other control measures.

What will the emissions impacts of the legislatively directed amendments be?

The legislatively directed amendments will allow many fleets to comply with the off-road regulation by utilizing credits received under the new provisions, rather than taking actions to reduce emissions. Hence, the amendments will allow fleets to perform fewer actions to reduce emissions than they otherwise would have, with the likely consequence that there will be less retirement of high-emitting vehicles, fewer repowers of vehicles with cleaner engines, and fewer installations of exhaust retrofits. This will likely result in fleets having older and higher emitting vehicles. Overall, staff anticipates that the legislatively directed amendments will increase the emissions compared to the emissions that would otherwise result from the regulation.

Because the legislatively directed amendments could lessen the requirements for many large fleets in the early years of the regulation, without mitigation, the changes could result in:

- A loss in emission reductions achieved in 2014 (a key milestone year for the SIP);
- A reduction in forecasted health benefits; and
- An adverse economic impact on retrofit manufacturers and installers that have geared up for off-road implementation, which could result in reduced ability of

that industry to have product available for compliance in future years, as well as the potential loss of "green" jobs associated with these industries.

However, staff recognizes that the recession has also impacted the emissions from many affected fleets. Many fleets have retired vehicles and reduced their vehicle activity and thereby reduced their emissions. However, staff does not have adequate data on how the current economic recession has affected the thousands of fleets in California to determine whether the emission reductions due to activity reductions and retirement are currently large enough to offset the emission benefit losses due to the legislatively directed amendments. A further analysis of which of these effects will have a larger impact on emissions is necessary. Staff is currently collecting and preparing to analyze relevant data from off-road fleets, including the reporting data required by the regulation, to address this question, and will provide an assessment of the of the impact of the regulatory changes to the emission reduction obligations contained in the SIP as part of staff's October, 2009 update to the Board

What does staff propose to do to mitigate the potential loss in emission benefits from the legislatively directed amendments?

Staff is proposing four amendments to mitigate the potential loss in emission benefits from the legislatively directed changes by spurring early actions by fleets to reduce emissions. These amendments are intended to encourage fleets to install retrofits and repower vehicles with cleaner engines earlier than they otherwise would. This could result in reduced emissions from large fleets that otherwise would take no actions until 2012 as a result of the legislatively directed amendments to the regulation. In turn, staff expects that these early actions will benefit companies that provide and install retrofits and repower solutions and help spur continued growth in green jobs. Because opting to take advantage of these incentives would be voluntary, they would not impose any requirements or costs on fleets.

The amendments to provide additional incentives for early action to reduce emissions are:

- Allow fleets to claim an exemption for up to 15 percent of their total horsepower from future turnover if they install a retrofit prior to March 1, 2011;
- Allow fleets to claim double credit for NOx retrofits installed by March 1, 2011;
- Allow medium and small fleets to claim double credit for PM retrofits installed by March 1, 2012; and
- Allow fleets to accumulate NOx carryover turnover credit for early repowers installed, regardless of the total amount of fleet hp that is repowered.

What will the emissions impacts of the additional incentives for early action be?

The emissions impact of staff's proposed amendments to encourage early retrofits and repowers would depend on their appeal to fleet owners. Staff estimated emissions benefits assuming that the new incentives for retrofits would spur approximately 400 retrofits that reduce PM only and 400 additional retrofits that reduce both PM and NOx,

and that the new incentive for repowers would spur 500 repowers. Table 3 below summarizes the estimated emissions benefits from these incentives. In total, for the amount of early actions described above, PM benefits of 0.1 tons per day (tpd) and NOx benefits of 1.9 tpd could be expected.

Table 3: Estimated Emissions Benefits of Proposed Incentives for Early Action

Incentive	Actions Incentivized	PM Benefits (tons per day)	NOx Benefits (tons per day)
Double Credit Towards NOx for Retrofits that Reduce NOx	400 Retrofits with 40% NOx reduction	0.05	0.5
Turnover Exemption for Retrofit Vehicles, and Extended Double Retrofit Credit for Small/Medium Fleets	400 Retrofits	0.05	0.1
Credit Issued for Repowers	500 Repowers	0.1	1.3
Total Benefits		0.2	1.9

What other amendments to the regulation are staff proposing and why?

Since January 2009, based on feedback and comments from affected fleets and other stakeholders, as well as an analysis by staff, staff is proposing that several other provisions of the regulation be clarified. Specifically, staff is proposing that the regulation clarify and provide that:

- The manufacturer delay provisions apply to installer delays as well;
- Community college programs that train students in the use of off-road vehicles are included in the definition of Non-Profit Training Center;
- Retrofit installation may be determined unsafe if it would make compliance with any federal or state safety requirements impossible;
- Public agency fire prevention activities are classified as forest operations; and
- Fleets must report to ARB within 30 days of selling a vehicle.

Staff believes these clarifications and modifications are necessary for successful implementation of the regulation. Staff does not believe the clarifications and modifications will have any quantifiable impact on emission reductions.

What will be the economic impact of the proposed amendments?

Overall, the proposed legislatively directed amendments will provide both a short-term and long-term cost savings to fleets subject to the regulation. However, at this time, staff does not have adequate data to determine how the current economic recession has affected each of the thousands of fleets in California, and thus staff cannot estimate a total dollar savings due to the legislatively directed amendments. In the interim, staff evaluated the impact of the proposed amendments on an example fleet to evaluate the

potential economic impacts of the proposed legislatively directed amendments. Staff found that if the example fleet had reduced its activity by half or retired half its vehicles, the proposed legislatively directed amendments would reduce its compliance costs by 76 to 100 percent during the first three years of the regulation. The amendments would also reduce the fleet's total compliance costs over the course of the regulation by up to one third.

The additional incentives for early action are expected to result in some additional long-term cost savings as well to fleets that take advantage of them. Similarly, the amendments to expand the definitions of Non-Profit Training Center and forest operations would result in overall cost savings for affected fleets.

Although the proposed amendments are not expected to adversely impact the economy overall, the legislatively directed changes could result in a negative economic impact on retrofit manufacturers and installers, and firms that provide repowers because they would receive fewer orders over the next few years. However, the proposed incentives for early action by fleets are intended to encourage early retrofitting and repowering and would help protect businesses that provide "green" jobs in California.

What objectives did staff have when interpreting the legislatively directed amendments?

When crafting staff's proposal, staff strove toward the following goals:

- *Consistency* – Develop a proposal consistent with the Legislature's direction;
- *Simplicity* – Implement the Legislature's direction in as clear and simple a manner as possible.
- *Never increase the stringency of the regulation* – Ensure that in no case would any fleet receive less credit (i.e., face greater compliance responsibilities) under the proposal than under the current regulation. This was critical because many fleets have already laid out their compliance plans for the regulation. Giving a fleet less credit than they were previously expecting under the current regulation would disrupt those plans.

What alternatives did staff consider and why were they rejected in favor of staff's proposal?

When considering how to implement the legislatively directed changes, staff did not consider alternatives intended to be inconsistent with AB 8 2X, but did consider different ways to interpret the AB 8 2X language. First, staff considered limiting the credit for vehicle retirements to Tier 0 vehicles only. Ultimately, based on stakeholder feedback, staff concluded it was more consistent with the intent of AB 8 2X to allow retirement credit for retirement of any vehicle, no matter it's emissions standard tier. Second, staff considered limiting reduced activity credit only to fleets with complete records of the hours of use for each and every vehicle. Again, based on feedback from fleets regarding the records that they were most likely to have available, staff modified this requirement to allow credit for fleets that could produce other types of documentation.

Third, staff considered a number of ways to determine the time period for reduced activity, but in the end concluded the period most consistent with the language in AB 8 2X was to center the time period on the dates laid out by the Legislature, where possible. Finally, staff explored various ways to handle credit for fleets that had both retired vehicles and reduced activity, eventually settling on a method that awards such fleets both types of credits but prevents inappropriate double counting.

When considering amendments to mitigate the loss in emission benefits from the legislatively directed changes, staff analyzed a number of options. Staff rejected alternatives that would have required a minimum amount of turnover and retrofit for fleets using the new credits, as well as increased BACT requirements for later years to make up for lost emission reductions. Staff determined that these options would have reduced the relief provided by AB 8 2X and hence would not be consistent with the intent of the legislation. Instead, staff chose to provide additional voluntary incentives for fleets to repower and retrofit, which would spur early emission reductions without imposing additional requirements on affected fleets.

I. INTRODUCTION

The purpose of this report is to describe amendments to the Regulation for In-Use Off-Road Diesel-Fueled Vehicle Fleets (the regulation), California Code of Regulations, Title 13, sections 2449 through 2449.3. Staff of the Air Resources Board (ARB or Board) is proposing amendments for three reasons - first, to implement the legislative directives set forth in the recently adopted California budget (Assembly Bill 8 2X or AB 8 2X); second, to mitigate potential losses in emission benefits due to the legislatively directed amendments; and third, to make minor amendments and clarifications to the regulation. Section A below provides background regarding the regulation, Section B discusses the need for emission reductions, and Section C outlines the organization and content of this report.

A. Background

The regulation was originally approved by the Board on July 26, 2007, formally adopted on April 4, 2008, and approved by the Office of Administrative Law (OAL) and filed with the Secretary of State on May 16, 2008. The regulation became effective on June 15, 2008. Additional amendments were approved by the Board on December 11, 2008 and January 26, 2009, though these amendments have not as yet been formally adopted by the Board or submitted to OAL for approval.

At the time of the Board's approval of the regulation in July 2007, staff estimated that the regulation would significantly reduce emissions of diesel PM and NOx from the nearly 200,000 in-use off-road diesel vehicles that operate in California and consequently significantly reduce the public's exposure to these pollutants. The regulation would achieve these environmental benefits by requiring fleet owners of off-road in-use diesel vehicles to modernize their fleets by accelerating the use of cleaner engines and exhaust retrofits in their vehicles (ARB, 2007a). The regulation supports the Diesel Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles, which was adopted by the Board on September 30, 2000, as well as the 2007 State Implementation Plans (SIPs) for the South Coast and San Joaquin Valley air basins (ARB, 2000; ARB, 2007c).

The scope of the regulation is far reaching; affecting vehicles of dozens of types used in thousands of fleets, in industries as diverse as construction, air travel, manufacturing, landscaping, and ski resorts, as well as public agencies. Once implemented, the regulation will affect, among others, the warehouse with one diesel forklift, the landscaper with a fleet of a dozen diesel mowers, the county that maintains rural roads, the landfill with a fleet of dozers, as well as the large construction firm or government fleet with hundreds of diesel loaders, graders, scrapers, and rollers.

The regulation's requirements vary depending on the size of the fleet and on the vintage of its vehicles. Fleets are defined in the regulation as small, medium, or large based on their total statewide horsepower (hp). The regulation requires that the largest fleets, which have the most significant emissions, meet the most stringent requirements. The

smallest fleets, and local municipal fleets located in low-population counties, are required to meet less stringent provisions.

B. Need for Emission Reductions

The emission reductions anticipated from the regulation are important from a public health standpoint and sorely needed to allow the state to meet its SIP commitments required by the Federal Clean Air Act (CAA). Because of this importance, which is described further below, when crafting the proposed amendments described in this report, staff included proposals to minimize any potential loss of emission benefits.

1. Significant source of emissions and adverse health impacts

The off-road vehicles covered by the regulation are a significant source of diesel PM, as well as NOx emissions that lead to ozone and ambient PM. Statewide, they are responsible for nearly a quarter of the total diesel PM emissions from mobile sources and nearly a fifth of the total NOx emissions from mobile diesel sources. The vehicles subject to this regulation were estimated to emit statewide about 386 tons per day (tpd) of NOx emissions and 23 tpd of PM emissions in 2005, which is 19 and 24 percent, respectively, of statewide diesel mobile source emissions (ARB, 2007b). Staff estimates that approximately 1,100 premature deaths were associated with the baseline uncontrolled emissions from in-use off-road diesel vehicles in 2005. The health impacts include direct effects from diesel PM as well as effects from secondary pollutants such as nitrate particles (ARB, 2007a).

In 1998, the Board identified diesel PM as a toxic air contaminant (TAC). Of all known air pollutants, diesel PM is the largest known contributor to ambient cancer risk. Diesel PM also contributes to ambient concentrations of fine particulate matter (PM2.5), which is associated with premature mortality, aggravation of respiratory and cardiovascular disease, asthma exacerbation, chronic and acute bronchitis and reductions in lung function.

NOx leads to formation in the atmosphere of ozone and PM2.5. Ozone is a powerful oxidant, and exposure to ozone can result in reduced lung function, increased respiratory symptoms, increased airway hyper-reactivity, and increased airway inflammation. Exposure to ozone is also associated with premature death, hospitalization for cardiopulmonary causes, and emergency room visits for asthma.

2. Public health benefit

The regulation was adopted in order to achieve significant emission reductions and protect public health. NOx emitted statewide from affected vehicles was expected to be about 13 percent lower in 2015 as a result of the regulation, and by 2020, NOx emissions were expected to be 32 percent lower than would occur in the absence of the regulation. The PM benefits were expected to be even greater. PM emissions from affected vehicles were expected to be 60 percent lower in 2015, and nearly 70 percent lower in 2020 than they would have been in the absence of the regulation (ARB, 2007b). Also, staff estimated that the regulation would prevent approximately 4,000

premature deaths statewide by 2030, as well as thousands of hospital admissions and asthma and bronchitis cases (ARB, 2007b).

3. SIP commitments

Under the CAA, the U.S. Environmental Protection Agency (U.S. EPA) has established national ambient air quality standards (NAAQS) for pollutants considered harmful to public health, including PM2.5 and ozone, to which NOx is a precursor. Set to protect public health, the NAAQS are adopted based on a review of health studies by experts and a public process. Areas in the state that exceed the NAAQS are required by federal law to develop SIPs demonstrating how they would attain and maintain the standards by certain deadlines. If the state fails to make this demonstration, it can be subject to sanctions, including the loss of federal highway funds.

Because of unique geographical and climatic conditions, combined with high numbers and concentration of people and mobile sources, California continues to have the worst air quality of any of the 50 states. Two air basins in California in particular – the South Coast Air Basin and the San Joaquin Valley Air Basin – are in nonattainment for both PM2.5 and the eight-hour ozone standard. The South Coast and San Joaquin Valley air basins are both required to attain the PM2.5 standard by 2015. California's SIP shows that to meet the PM2.5 standard in the South Coast and the San Joaquin Valley Air Basins, reductions of NOx on the order of 50 percent are needed. Reductions of NOx of 80-90 percent will be needed to achieve the 8-hour ozone standard in the South Coast and San Joaquin Valley. Clearly, with this magnitude of reductions needed, the emission reductions from the regulation are sorely needed.

California's 2007 SIP included the regulation as a control measure. ARB's legal commitment to achieve the emission reductions laid out in the SIP relies upon the following emission reductions from the regulation by 2014 - 10.5 tpd NOx reductions and 2.6 tpd PM2.5 reductions in the South Coast, and 3.7 tpd NOx and 0.8 tpd PM2.5 reductions in the San Joaquin Valley (ARB, 2007c). If the regulation falls short of achieving these reductions, the loss would need to be made up for by other control measures.

C. Report Overview

Chapter II of this report describes the regulatory authority ARB has to adopt the proposed amendments to the regulation, the need for the amendments, the public process used to develop the amendments, and the amendments in detail.

Chapter III describes the anticipated economic impacts of the amendments.

Chapter IV describes the anticipated environmental impacts of the amendments, including their impact on air quality and other environmental impacts.

Chapter V describes other alternatives staff considered when implementing the legislatively directed amendments.

Chapter VI lists the references used to develop this report.

The appendices contain the AB 8 2X legislation, proposed regulatory language for the amendments, detailed examples of how the proposed amendments would affect the credit accumulated by fleets as they comply with the regulation, and other supplementary information.

D. Staff Recommendation

Staff recommends that the Board adopt the proposed amendments to California Code of Regulations, title 13, sections 2449 through 2449.3, as described in Chapter II and set forth in Appendix B.

II. PROPOSED AMENDMENTS TO THE REGULATION FOR IN-USE OFF-ROAD DIESEL-FUELED FLEETS

This chapter discusses the regulatory authority and rationale for staff's proposal, as well as the public process used to develop the proposed amendments to the regulation, which are also discussed in detail.

A. Regulatory Authority

ARB has authority under California law to adopt the proposed regulation amendments. California Health and Safety Code (Health & Saf. Code) sections 43000, 43000.5, 43013(b) and 43018 provide broad authority for ARB to adopt emission standards and other regulations to reduce emissions from new and in-use vehicular and other mobile sources. Under Health & Saf. Code sections 43013(b) and 43018, ARB is directly authorized to adopt emission standards for off-road vehicular sources, as expeditiously as possible, to meet state ambient air quality standards. ARB is further mandated by California law under Health & Saf. Code section 39667 to adopt Air Toxic Control Measures (ATCMs) for new and in-use vehicular sources, including off-road diesel vehicles, for identified TACs, such as diesel PM.

Under federal and California law, ARB is the primary agency in California responsible for making certain that all regions of the State attain and maintain NAAQS. To achieve this, California must adopt all feasible measures to obtain the necessary emission reductions, including measures from mobile sources. The CAA preempts states, including California, from adopting requirements for new off-road engines less than 175 hp used in farm or construction equipment. California may adopt emission standards for in-use off-road engines (per CAA section 209(e)(2)), but must receive authorization from U.S. EPA before it may enforce the adopted standards. The regulation addresses in-use rather than new off-road engines, and is therefore not prempted. For example, turnover of a vehicle is not required until a vehicle is older than 10 years. ARB requested that the U.S. EPA grant authorization for the regulation on August 12, 2008, and a decision is pending.

B. Rationale for Amendments

As part of the recently signed California budget, the Legislature passed and the Governor signed AB 8 2X, directing ARB to make several amendments to the regulation. The pertinent provisions of AB 8 2X are codified at section 43018.2 of the Health & Safety Code and included herewith as Appendix A. The amendments include the following:

- For the total cumulative turnover and retrofit requirements for the years 2011 through 2013, fleets may complete 20 percent of those requirements by March 1, 2011, an additional 20 percent by March 1, 2012, and the balance by March 1, 2013;
- Fleets will be given credit (for both PM and NOx) for any vehicle retirements made between March 1, 2006, and March 1, 2010, provided that total fleet hp decreased from the previous year; and

- Fleets who are now using their off-road vehicles less than they did as of July 1, 2007, may take credit for this reduced fleet activity to satisfy the turnover and retrofitting requirements of the regulation in 2010 and 2011.

Because the legislatively directed amendments could lessen the requirements for many large fleets in the early years of the regulation, without mitigation, the amendments could result in:

- A loss in emission reductions achieved in 2014 (a key milestone year for the SIP);
- A reduction in health benefits; and
- An adverse economic impact on retrofit manufacturers and installers that have geared up for off-road implementation, which could result in reduced ability of that industry to have product available for compliance in future years, as well as a potentially significant loss of "green" jobs.

Therefore, in addition to amending the regulation to meet the directives of AB 8 2X, staff is also proposing amendments to provide incentives to mitigate some of these potential impacts by incentivizing early actions to reduce emissions. These proposed incentives are intended to encourage fleets to voluntarily install retrofits and repower vehicles with cleaner engines earlier than otherwise required. Staff believes that they would spur some fleets that receive new credit from the legislatively directed amendments, and that as a consequence might not need to take any compliance action until 2012 or later, to act sooner to reduce their emissions than otherwise required. In turn, staff believes that these early actions would potentially benefit companies that provide retrofits and repower solutions and help avoid losing green California jobs that might be adversely affected by the compliance delays resulting from the implementation of the provisions of AB 8 2X.

Finally, based on feedback and comments from affected fleets and other stakeholders, as well as analysis by staff, a number of other provisions of the regulation that require clarification or modification have been identified. Staff believes these clarifications and modifications are necessary for the successful implementation of the regulation.

C. Public Process

Staff held two public workshops to solicit public input on the proposed amendments to the regulation. The first one was held on April 7, 2009, in Sacramento, California. At that workshop staff presented an initial proposal to implement the legislatively directed changes. Staff held a second workshop on April 29, 2009 in Diamond Bar, California. At this second workshop staff presented a modified proposal based on comments received at the first workshop. As part of the revised proposal, staff developed two documents - one describing staff's revised proposal for the April 29, 2009, workshop and another that provides detailed examples of how the legislatively directed amendments would apply to fleets in various situations (ARB, 2009b; ARB, 2009c). Staff sent both documents to an electronic mailing list that included approximately 3,000 names, and also distributed them at the April 29, 2009, workshop.

In addition to the workshops, staff held meetings with individual fleets and, at the May 7, 2009, Off-road Implementation Advisory Group (ORIAG) meeting, solicited input from ORIAG members on the proposed amendments.[1]

Staff also met with Air and Land Managers Group (consisting of several federal and state agencies) on May 21, 2009, to discuss clarifying that public agency fire prevention activities would be classified as forest operations as part of the proposed amendments. The discussion included a review of vehicles the proposed exemption would apply to, and what portion of the vehicles' operations involves forest fire prevention (e.g., installing fuel breaks, firebreaks, and fire hazard abatement, etc.).

Staff considered all comments and recommendations received from various stakeholders, and crafted the final proposed amendments to address the concerns that were expressed.

D. Proposed Amendments

Staff is proposing the following amendments to the regulation to implement the directives of AB 8 2X:

- Allow fleets that comply by using the Best Available Control Technology (BACT) provisions to take fewer actions than are currently required to meet the regulation's 2011 and 2012 compliance dates, but make up for the difference by the 2013 compliance date;
- Allow fleets that retire vehicles between March 1, 2006, and March 1, 2010, thereby reducing their total fleet hp, to receive credit for the retirements, which can then be used to meet the BACT turnover and retrofitting requirements of the regulation; and
- Allow fleets that have experienced reduced fleet operational activity since 2007 to receive credit for this reduced fleet activity that can then be used to meet the BACT turnover and retrofitting requirements of the regulation in 2010 and 2011.

In addition, staff is also proposing the following amendments to encourage voluntary early actions to reduce emissions:

- Allow fleets to claim an exemption from future turnover, up to a specified percentage of their total hp, if they install a retrofit prior to March 1, 2011;
- Allow fleets to claim double credit for NOx retrofits installed by March 1, 2011;
- Allow medium and small fleets to claim double credit for PM retrofits installed by March 1, 2012; and
- Allow fleets to accumulate NOx carryover turnover credit for repowers with new engines certified to Tier 2 or cleaner standards.

Finally, staff is proposing a number of amendments to clarify and provide that:

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[1] The mission of ORIAG - a committee made up of affected fleets, retrofit providers, vehicle manufacturers and other stakeholders - is to help ARB staff improve outreach and implementation materials and help make staff more aware of the needs and opinions of affected stakeholders.

- The manufacturer delay provisions apply to installer delays as well;
- Community college programs that train students in the use of off-road vehicles are included in the definition of Non-Profit Training Center;
- A retrofit installation may be determined unsafe if it would conflict with any federal or state safety agency requirements;
- Public agency fire prevention activities are classified as forest operations; and
- Fleets must report to ARB within 30 days of selling a vehicle.

A more detailed discussion of all the amendments staff is proposing is provided below. Appendix C details examples of how the proposed new credits would apply to fleets.

1. Legislatively directed amendments

Subsections a through c below describe staff's proposal to implement AB 8 2X.

a) *Revised BACT schedule*

Current Requirements

Currently, the regulation requires fleets to either meet the fleet average requirements or the BACT retrofit and/or turnover requirements. The same fleet average emission rate targets for PM apply to all fleets, regardless of fleet size, but the NOx fleet average targets apply only to large and medium fleets. Small fleets are exempted from having to meet any of the NOx performance requirements. Compliance dates are staggered based on fleet size. Each individual fleet's emission targets vary depending on the distribution of horsepower of the fleet. The fleet average targets drive fleets to modernize their vehicles faster than natural turnover otherwise would.

Fleets that cannot or choose not to meet the fleet average targets (for PM or NOx) may comply with the requirements of the regulation by meeting the BACT requirements. The current NOx BACT requirements require fleets to turn over 8 percent of the fleet's maximum hp each year until 2015, after which time the requirement increases to 10 percent. To meet the turnover requirements, a fleet must turn over Tier 0 and Tier 1 vehicles (those with engines that were not subject to a new engine PM standard) before turning over any higher tiered vehicles. Compliance options for meeting the NOx turnover requirements include the following:

- Replace older vehicles with new or used vehicles;
- Replace diesel vehicles with electric or alternative fuel vehicles;
- Repower older engines with Tier 2 or higher engines;
- Retire vehicles from fleet;
- Designate vehicles as permanent low-use (i.e., used less than 100 hours per year); or
- Install NOx verified diesel emission control strategies (VDECS).

The PM BACT requirements consist of installing VDECS on 20 percent of the fleet's maximum hp in each compliance year.

Fleets must meet the in-use performance requirements by March 1 of each year, according to the following schedule:

- Large fleets: 2010-2020 (PM and NOx);
- Medium fleets: 2013-2020 (PM and NOx); and
- Small fleets: 2015-2025 (PM only, exempt from NOx requirements).

Proposed Amendments

Staff proposes to amend sections 2449.1(a)(2)(A) and 2449.2(a)(2)(A) to allow a fleet to achieve its BACT turnover and retrofit requirements for the years 2011 to 2013, inclusive, by completing 20 percent of its cumulative turnover and retrofit obligations in 2011, an additional 20 percent in 2012, and the balance in 2013. This change would allow large fleets the option to defer a portion of the turnover and retrofits otherwise required in 2011 and 2012 to 2013, and result in a reduction of compliance costs in 2011 and 2012. Table 4 shows the current regulatory provisions and the proposed revised BACT schedule.

Table 4: Proposed Revised BACT Requirements
(Percent turnover required / Percent retrofit required)

Regulation	2010	2011	2012	2013	2014
Current	8 / 20	8 / 20	8 / 20	8 / 20	8 / 20
Proposed	8 / 20	4.8 / 12	4.8 / 12	14.4 / 36[2]	8 / 20

The proposed revised BACT schedule, for fleets failing to meet the fleet averages in 2011 and 2012, changes the requirements for the years 2011 through 2013. In 2011 and 2012, fleets must turn over 4.8 percent of their total fleet hp and retrofit 12 percent of their total fleet hp. In 2013, fleets must turn over 14.4 percent of their total fleet hp and retrofit 36 percent of their total fleet hp. The proposed amendments contain special provisions for fleets that meet the fleet averages during 2011 and/or 2012, to ensure that such fleets are not required to take more actions than the current regulation would required them to. These provisions specifically provide:

- Large fleets that meet the fleet average targets in 2011, but do not meet them in 2012, must turn over 11.2 percent and retrofit 28 percent of their total hp in 2013 (explanation in next paragraph);
- Large fleets that meet the fleet average targets in 2012, but not in 2013, must turn over eight percent and retrofit 20 percent of their total hp in 2013; and
- All medium fleets must turn over eight percent and retrofit 20 percent of their total hp by the 2013 compliance date.

Under the current regulation, fleets that meet the NOx fleet average target in 2011, but not in 2012, have to turn over 8 percent of their total hp in 2012, and again in 2013. So as not to make the regulation more stringent than it currently is, if a fleet meets the fleet

[2] In 2013, turnover/retrofit requirements for large fleets that meet the fleet average targets in 2011, but not in 2012, are 11.2/28 percent, and those for large fleets that meet the fleet average targets in 2012 are 8/20 percent.

average target in 2011, and then turns over 4.8 percent in 2012, it need only turn over 11.2 percent in 2013 (for a total of 16 percent for 2012-2013). Similarly, under the current regulation, fleets that meet the PM fleet average target in 2011, but not in 2012, have to retrofit 20 percent of their total hp in 2012, and again in 2013. So as not to make the regulation more stringent than it currently is, if a fleet meets the fleet average target in 2011 and then has to meet the BACT retrofit requirements in 2012, it would have to retrofit 12 percent in 2012; in 2013, in order to ensure that it does not have to perform additional retrofitting of vehicles relative to the current requirements, it would need to retrofit 28 percent (for a total of 40 percent in 2012-2013).

Figure 1 and Figure 2 below illustrate the proposed changes to the NOx and PM BACT requirements, respectively.

Figure 1: Proposed NOx BACT Turnover Requirements for Large Fleets (Annual percent of hp)

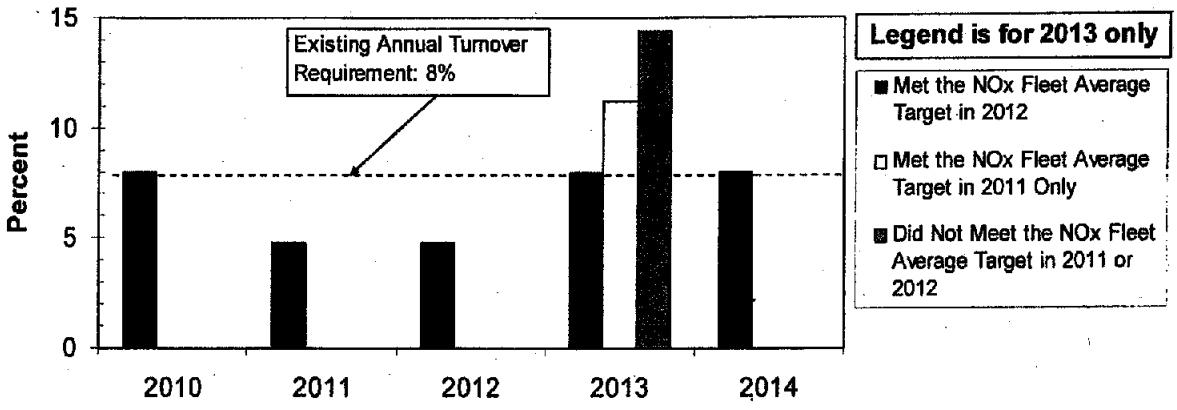
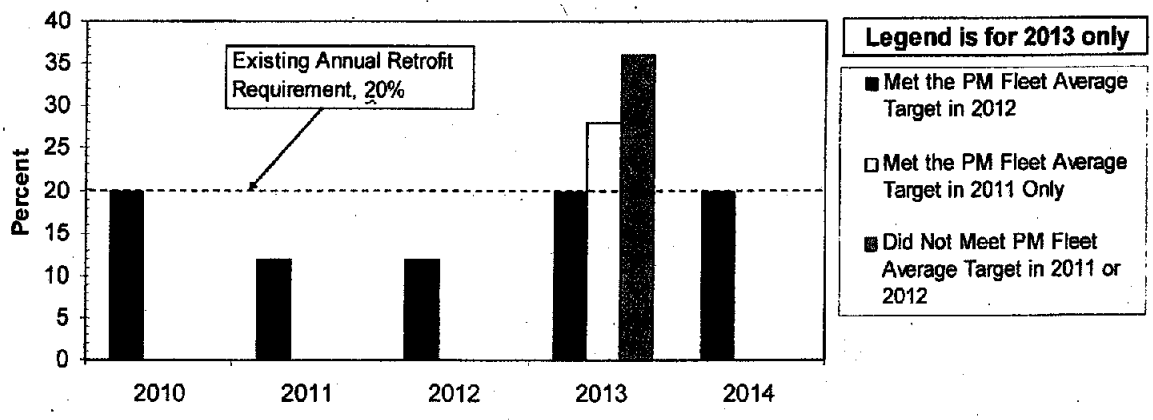


Figure 2: Proposed PM BACT Retrofit Requirements for Large Fleets (Annual percent of hp)



Staff proposes to include this provision so that the proposed amendments do not provide a disincentive to meeting the fleet average targets in either 2011 or 2012, and so as not to increase the stringency of the performance requirements for medium fleets.

Under the proposed revised BACT schedule, fleets would continue to obtain PM carryover credit whenever they retrofit more than is required. Likewise, they would obtain NOx carryover credit whenever they turn over more than is required. For example, a fleet utilizing the proposed revised BACT schedule that turns over six percent of its maximum hp in 2011, would only be required to turnover an additional 3.6 percent in 2012 (as a carryover credit of 1.2 percent would have been banked from 2011). Similarly, a fleet that retrofits 20 percent of its maximum hp in 2011 would only be required to retrofit 4 percent in 2012 (as a carryover credit of 8 percent would have been banked from 2011).

b) *Additional credit for vehicle retirement*

Current Requirements

Currently, the regulation provides early credit (for NOx only) for voluntary retirement or replacement of Tier 0 engines in excess of an average turnover rate of eight percent per year between March 1, 2006, and March 1, 2009. Therefore, for example, if a fleet retired or replaced its Tier 0 machines at a rate of 10 percent per year between 2006 and 2009, the fleet would obtain a six percent early credit towards the NOx BACT requirements. Once obtained, these credits do not expire.

Proposed Amendments

Staff is proposing amendments to sections 2449.1(a)(2)(A)2.a. and 2449.2(a)(2)(A)2.a. that would allow fleets to claim credit for vehicle retirements (regardless of engine tier) that reduce their total fleet hp between March 1, 2006, and March 1, 2010. The new credit would also not require retirement in excess of an average eight percent per year between March 1, 2006 and March 1, 2009. This new retirement credit could be used by fleets to satisfy their NOx and PM BACT requirements, and would not expire. In order to effectively implement the new provisions, staff also proposes to amend section 2449(g) to require fleets that claim the proposed retirement credit to report specific information in support of their claims, and to amend section 2449(h) to add recordkeeping requirements associated with claiming and reporting the new retirement credit.

As with the reduced activity credit, the retirement credit would allow some large fleets to reduce or completely eliminate the need to take compliance actions in the early years of the regulation and would primarily benefit those fleets that have significantly downsized since 2006. Because the new credits do not expire, they may be banked and used by fleets for several years and thus could assist some medium and small fleets as well.

c) *Reduced activity credit*

Current Requirements

There are currently no provisions in the regulation specifically providing credits for reduced fleet activity. However, the regulation does provide special consideration for low-use vehicles and takes hours of operation into account in determining whether a vehicle qualifies under that provision.

Proposed Requirements

Staff proposes to add provisions to sections 2449.1(a)(2)(A)2.a. and 2449.2(a)(2)(A)2.a. that would allow fleets to claim credit for reduced activity between July 1, 2007, and March 1, 2010. The new provisions specify that the new reduced activity credit may be used by fleets to satisfy their NOx and PM BACT requirements, but will only be applicable to the March 1, 2010 and March 1, 2011 compliance dates.

Staff also proposes to amend section 2449(g) to require reporting of information for those fleets claiming the reduced activity credit. Staff also proposes to amend section 2449(h) to add the recordkeeping requirements associated with claiming the new reduced activity credit.

Staff proposes to determine reduced activity by comparing activity during the period January 1, 2007, to December 31, 2007, (centered on July 1, 2007, the date specified in AB8 2X) to the activity during the period March 1, 2009, to February 28, 2010. Staff proposes to use horsepower hours (hp-hours) -- that is work done by one hp in one hour -- to determine activity. Utilizing hp-hours to determine activity is more reflective of emissions relative to simply using hours. It also provides an equitable methodology, such that a fleet that starts using a lower hp vehicle in lieu of using a higher hp vehicle will receive the appropriate credit. Therefore, the activity reduction would be the percent reduction in hp-hours activity from the initial period (January 1, 2007, to December 31, 2007) to the later period (March 1, 2009, to February 28, 2010).

Staff solicited feedback at the two public workshops, held on April 7, 2009, and April 29, 2009, and at the ORIAG meeting held on May 7, 2009, regarding the types of records that fleets have that represent reduced activity and to what degree those records aptly represent reduced activity. Staff indicated that these records would need to be from January 1, 2007, through February 28, 2010. At these meetings, some fleet owners stated that they had hour-meter logs, vehicle operator logs, maintenance records that demonstrate vehicle use, and/or other records that clearly define the hours of use for each vehicle. However, other fleet owners informed ARB staff that although they do not have records for each vehicle, they have records of off-road diesel fuel use, operator logs (that do not identify which vehicles were used), and/or other indicators that demonstrate fleet activity, but do not define activity directly by vehicle. Lastly, some fleet owners stated that they only have records that do not directly correlate to fleet activity, such as overall employment, revenue, cost of construction put in place, or other indicators of business or staffing activity.

To address this, staff is proposing varying levels of reduced activity credit depending on the quality and type of records available, as described below:

1. For fleets that can demonstrate the individual hours of use for each vehicle in the fleet from January 1, 2007, through February 28, 2010, the amendments would:
   - Allow fleets to receive full credit for the percent reduction in fleet activity.
   - Identify acceptable records that include hour-meter logs, operator logs that show which vehicles were used and how often, maintenance records that demonstrate vehicle use, or other records that clearly define the hours of use for each vehicle.
   - Allow fleets to combine their reduced activity credit with credit for retiring vehicles from 2006 through 2010. That is, they could take credit for vehicles retired, and then also take credit for activity reductions from the remaining vehicles.

2. For fleets with records that show a reduction in overall fleet activity, but do not have records for each vehicle, the amendments would:
   - Allow fleets to receive full credit for the percent reduction in fleet activity.
   - Identify acceptable records, that include off-road diesel fuel use information for the fleet, operator logs that do not identify which vehicles were used, or other indicators that demonstrate fleet activity, but do not define activity by vehicle.
   - Not be allowed to combine their credits with vehicle retirements, as they would be unable to demonstrate that the reduced activity was not due to the reduction of fleet hp without vehicle-specific records. Any retirement credit for these fleets must be subtracted from reduced activity credit.

3. For fleets with records that show a reduction in business not directly tied to fleet usage, the amendments would:
   - Allow fleets to receive up to a 20 percent credit only.
   - Identify acceptable records that include overall employment, revenue, cost of construction put in place, or other indicators of business or staffing activity that do not necessarily directly correlate to fleet activity.
   - Not allow fleets to combine their credits with vehicle retirements. Any retirement credit for these fleets must be subtracted from reduced activity credit, so as to prevent potential doublecounting.

This new reduced activity credit would allow some large fleets to reduce or completely eliminate the need for compliance action in 2010 and 2011, thereby delaying action until later years. The new credit would primarily benefit those fleets that have experienced the greatest reduction in activity since 2007. Staff proposes the credit for fleets with records that show a reduction in business not directly tied to fleet usage, to receive up to 20 percent credit, as this would provide enough credit to meet the highest PM BACT requirement of 20 percent in a given compliance year.

Under staff's proposal, fleets that have retired vehicles and also have reduced activity from the remaining vehicles in the fleet could claim credit for the retired vehicles but only a reduced activity credit for the activity reduction related to the non-retired vehicles in the fleet. That is, a fleet could not double count retired vehicles (i.e., receive credit for retiring and reduced activity for the same vehicle).

2. *New Incentives for Early Action*

Staff is proposing a number of specific measures to help offset the loss in emission benefits due to the legislatively directed amendments, as well as to spur early retrofits and repowers of affected vehicles. (Section IV.b. discusses the loss in emission benefits further.) These new incentives are also intended to help protect and create green jobs in California through retrofit technology engineering and development, system assembly, installation, and maintenance. In addition, the new incentives will increase the likelihood that sufficient retrofit manufacturers and installers will remain viable and be available to assist fleets with compliance in future years.

a) *Exempt vehicles retrofit early from future turnover*

Current Requirements

There are currently no requirements to exempt vehicles that are retrofit early from the turnover requirements. However, the regulation currently allows specialty vehicles to be considered exempt from the NOx turnover requirements.

Proposed Requirements

Staff proposes to amend section 2449.1(a)(2)(A)4. to allow fleets to claim a limited exemption from future NOx turnover requirements if they install a highest level VDECS prior to March 1, 2011. This credit would provide an incentive for fleets to install retrofits and achieve immediate PM reductions earlier than they otherwise would. Using this exemption would be purely voluntary, so it would impose no additional requirements on fleets. Staff is proposing to limit the exemption by capping the number of vehicles for which a fleet can claim the exemption to no more than 15 percent of the hp in the fleet as of March 1, 2011; this would effectively mitigate potential long-term effects on emission reductions.

b) *Double credit for e arly NOx retrofit*

Current Requirements

Currently the regulation provides single credit for early NOx retrofits. The provision allows fleets that have installed VDECS that have been verified as achieving NOx reductions on their vehicles before March 1, 2009, to accrue carryover turnover credit (in hp) equal to: [(verified percent NOx reduction divided by 60 percent) multiplied by (maximum hp of the vehicle on which the NOx retrofit was installed before March 1, 2009).]

For example, if a fleet installs a NOx retrofit (with 30 percent emission reduction) on a 200 hp vehicle, under the current requirements, the credit would be calculated as: (30/60) * (200) = 100 hp

Proposed Amendments

Staff is proposing to amend section 2449.1(a)(2)(A)2.a. to add a provision to allow fleets to claim double credit for NOx retrofits installed by March 1, 2011. The double NOx credit could be used by fleets to satisfy their NOx BACT requirements in future years. The regulation currently provides double credit for early PM retrofits, and this proposed amendment would provide a similar incentive for NOx retrofits.

For example, if a fleet installs a NOx retrofit (with 30 percent emission reduction) on a 200 hp vehicle, under the proposed amendments, the credit would be calculated as: 2*(30/60) * (200) = 200 hp

Staff recommends this double credit because it could help mitigate the potential loss in NOx emission reductions from the legislatively-directed amendments by providing an incentive for early NOx reductions. This new provision would be voluntary as well, so it would also not impose any additional requirements on fleets.

c) ***Repower credit***

Current Requirements

Currently, the regulation allows early credit for fleets that have repowered their vehicles with Tier 1 or higher engines before March 1, 2009. Under this provision, fleets begin with a carryover turnover credit (in hp) equal to the maximum power of Tier 1 or higher repower engines installed in affected vehicles before March 1, 2009. However currently, no carryover credit can be awarded to a medium fleet between 2010 and 2013, unless it has turned over more than eight percent of its hp per year. Also, currently in 2010 and 2011, no carryover credit can be awarded to a large fleet utilizing the new retirement or reduced activity credit unless it has turned over more than eight percent of its hp per year as well.

Proposed Amendments

Staff proposes to amend section 2449.1(a)(2)(A)2.b. to add a provision to allow medium fleets prior to their initial compliance date in 2013 and large fleets in 2010 and 2011 to accumulate NOx carryover turnover credit for repowers installed, even if such repowers do not exceed eight percent of its total fleet hp. This change is intended to encourage large fleets to pursue repowers in 2010 and 2011 even if the new reduced activity and retirement credits would otherwise allow them to comply in those years with no additional turnover, as well as to encourage medium fleets to pursue repowering in the years prior to their initial 2013 compliance date.

d) *Extension of double PM retrofit credit for small/medium fleets*

Current Requirements

Currently the regulation provides single credit for medium fleets that install highest level VDECS on their vehicles between March 1, 2009, and February 29, 2012, and for small fleets that install highest level VDECS on their vehicles between March 1, 2009, and February 28, 2014.[3]

Proposed Amendments

Staff proposes to amend section 2449.1(a)(2)(A)2.a.ii. to provide double credit for small and medium fleets that install highest level VDECS on their vehicles prior to March 1, 2012. The double PM credit could be used by fleets to satisfy their PM BACT requirements in future years.

Staff recommends this double credit for small and medium fleets because it could help mitigate the potential loss in PM emission reductions from the legislatively-directed amendments by providing an incentive for early PM reductions. This new provision would be voluntary as well, so it would also not impose any additional requirements on fleets.

3. Other Proposed Amendments

a) *Definition of nonprofit training centers (community colleges)*

Current Requirements

Currently, the definition in section 2449(c)(38) applies only to entities qualifying as a non-profit or not-for-profit organization under title 26 Internal Revenue Code section 501(a), (c)(3), (c)(5), or (c)(6). Since adoption of the regulation, staff has learned that community colleges run similar training programs to those included in the current definition of Non-Profit Training Center, but that these programs do not meet the non-profit or not-for-profit Internal Revenue Code definitions above. Per the definition of small fleet in section 2449(c)(25), Non-Profit Training Center fleets are considered small and therefore are provided more time to comply while being exempt from the NOx provisions, regardless of their total hp.

Proposed Amendments

Staff is proposing to amend the definition of Non-Profit Training Center in section 2449(c)(38) to include community college programs that train students in the use of off-road vehicles. Staff proposes that only the vehicles used by a community college for an off-road vehicle training program be considered a non-profit training center and any

[3] Based on amendments approved in January 2009, the regulation will provide double credit for retrofits installed before January 1, 2010, but single credit thereafter.

vehicles that are not used for an off-road training program would not be considered part of a non-profit training center.

Staff believes that community college training programs should be extended this same consideration for the same reason it was extended to other non-profit training centers, namely that they have little opportunity to raise the money needed to pay for compliance, and that their equipment is relatively low-use.

b) *Amend m anufacturer delay provisions to also apply to installer delays*

Current Requirements

Currently the regulation provides an extension for fleet owners who have purchased an engine or VDECS at least four months prior to the compliance date. Therefore, fleet owners are excused from immediate compliance if the engine or VDECS is not available in time due to manufacturer delays.

Proposed Amendments

Staff is proposing to amend section 2449(e)(6) to clarify that the section applies to installer delays as well as manufacturer delays, both of which are beyond the fleet owner's control. Hence, a fleet owner who has purchased an engine or VDECS in order to comply with this regulation, will be excused from immediate compliance if the engine or VDECS is not installed in time due to installer delays as long as the engine or VDECS was purchased at least four months prior to the compliance date.

Documentation from the installer confirming that there is a delay, such that the retrofit or engine will be received or installed after the compliance date, is required under the proposed amendment. Any fleet requesting a compliance extension due to manufacturer or installer delays must be able to provide proof of purchase records and show that the fleet owner had entered into a contractual agreement for the purchase and installation of a VDECS at least four months prior to the required compliance date.

c) *Clarify safety provisions to include meeting federal requirements*

Current Requirements

Fleet owners may currently request that the Executive Officer find that a VDECS should not be considered the highest level VDECS available because its use would make compliance with occupational safety and health requirements, mining safety and health requirements, or an ongoing local air district permit condition, impossible.

Proposed Amendments

Staff is proposing to amend section 2449(e)(8) to clarify that a retrofit installation may be determined unsafe if it would make compliance with any federal or state safety requirement impossible. Since the performance requirements may apply to types of equipment that must meet other requirements (e.g., airport ground support equipment must comply with Federal Aviation Administration requirements), staff believes it is appropriate to clarify that these requirements are not inconsistent with federal and state safety requirements.

d) *Clarify d efinition of forest operations to include public agency fire prevention activities*

Current Requirements

Currently, the definition of agricultural operations includes forest operations such as installing fuel breaks, firebreaks, and fire hazard abatement, if they are "for commercial purposes." However, if such activities were undertaken by a public agency, they are not covered by the definition.

Proposed Amendments

Staff is proposing to amend section 2449(c)(26) to clarify that public agency fire prevention activities are classified as forest operations. Thus, vehicles used solely for such activities would be considered to be used for agricultural operations and be exempt from the off-road regulation irrespective of whether they are performed by a public agency or private entity. Staff is proposing the modification for reasons of equity and to avoid discouraging public agencies from undertaking fire prevention activities.

e) *Clarify reporting vehicle sales*

Current Requirements

Although the regulation requires fleets to report added vehicles to ARB within 30 days, there are currently no requirements for fleet owners to report vehicle sales to ARB within 30 days. Fleet owners are only required to report sold vehicles by their next compliance date.

Proposed Amendments

Staff is proposing to amend section 2449(g) to require that fleets report to ARB within 30 days of selling a vehicle. Section 2449(g)(1) already requires that fleets report within 30 days of purchasing a vehicle or bringing it into California. To enable fleets to add vehicles that they have purchased from another fleet and for the vehicles to maintain their Equipment Identification Numbers (EINs), it is also necessary for fleets to report sales in the same time frame. If vehicles that are sold are not reported within 30 days, fleets that purchase vehicles that have already been reported to ARB would likely have

to remove EINs from vehicles, get a new EIN, and relabel the vehicle. If the original EIN stays with the vehicle, tracking would be more streamlined and fleet owners would not have to utilize additional resources to change EINs.

III. ECONOMIC IMPACTS

This chapter describes the potential economic impacts of staff's proposal, specifically the legislatively directed amendments and other proposed amendments that will affect the compliance requirements of fleets subject to the regulation.

A. Legal Requirements

Sections 11346.3 and 11346.5 of the Government Code require state agencies to assess the potential for adverse economic impacts on California business enterprises and individuals when proposing to adopt or amend any administrative regulation. The assessment shall include a consideration of the impact of the proposed regulation or amendments on California jobs, business expansion, elimination, or creation, and the ability of California businesses to compete.

State agencies are also required to estimate the cost or savings to any state or local agency and school districts in accordance with instruction adopted by the Department of Finance. This estimate is to include any nondiscretionary costs or savings to local agencies and the costs or savings in federal funding to the state.

B. Legislatively Directed Amendments

The legislatively directed amendments lessen the requirements for large fleets; in fact many large fleets may not need to take any compliance actions in 2010 and 2011 as a result of these amendments. This is because, due to the current recession, there will be a large number of reduced activity and retirement credits accrued.

Because staff does not have complete data on how the current economic recession has affected each of the thousands of off-road fleets in California subject to the regulation, staff cannot estimate at this time a total dollar savings due to the legislatively directed amendments. However, to examine the potential economic impacts of the legislatively directed amendments, staff evaluated the impact of these proposed amendments on an illustrative individual fleet. The methodology and results of this analysis are described in the sections below.

1. Methodology

To estimate comparative compliance costs for fleets under the legislatively directed amendments relative to the current requirements of the regulation, staff reevaluated a previous analysis of an actual large earth moving fleet that shared its fleet information with staff during the development of the original rulemaking. Staff used average costs for repowers, vehicle replacements, and retrofits as outlined in the original Staff Report and the Technical Support Document (ARB, 2007a; ARB 2007b) to estimate the total compliance costs for the fleet under four different scenarios:

1) **Current regulation with reduced activity:** Compliance with the original regulation approved in July 2007 with no legislatively directed amendments. The

fleet has reduced its activity of each vehicle by 50 percent, but has retired no vehicles;

2) **Proposed amended regulation with reduced activity:** Compliance with the regulation, including the legislatively directed amendments. The fleet has reduced the activity of each vehicle by 50 percent, but has retired no vehicles;
3) **Current regulation with reduced hp**: Compliance with the original regulation. The fleet has reduced its total fleet horsepower by 50 percent, but has not reduced the activity of its remaining vehicles; and
4) **Proposed amended regulation with reduced hp:** Compliance with the regulation, including the legislatively directed amendments. The fleet has reduced its total fleet horsepower by 50 percent, but has not reduced the activity of its remaining vehicles.

The results of these four scenarios are provided in Section 2 below.

2. *Individual fleet analysis results*

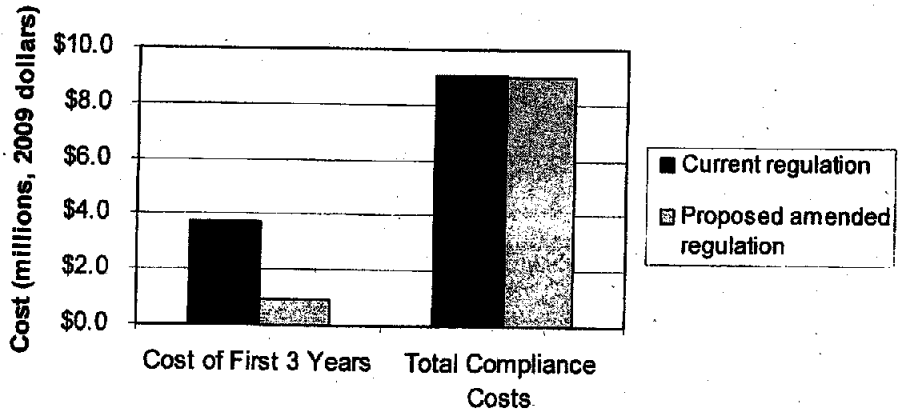
The compliance costs for the example fleet are shown for each scenario in Table 5 and Table 6 below, as well as in Figure 3 and Figure 4. As shown in Table 5 and Table 6, the legislatively directed amendments will allow fleets to reduce their compliance costs in the initial years of the regulation, as well as their compliance costs over the thirty year phase-in of the program.

Table 5: Costs for a Fleet with Reduced Activity

Scenario	Compliance Costs for First Three Years of Regulation (2009 dollars)[4]	Total Compliance Costs Over Entire Regulation (2009 dollars)[4]
Current regulation with reduced activity	$3,751,000	$9,098,000
Proposed amended regulation with reduced activity	$909,000	$9,007,000

[4] Assuming an annual 5 percent real interest rate.

Figure 3: Costs for a Fleet with Reduced Activity



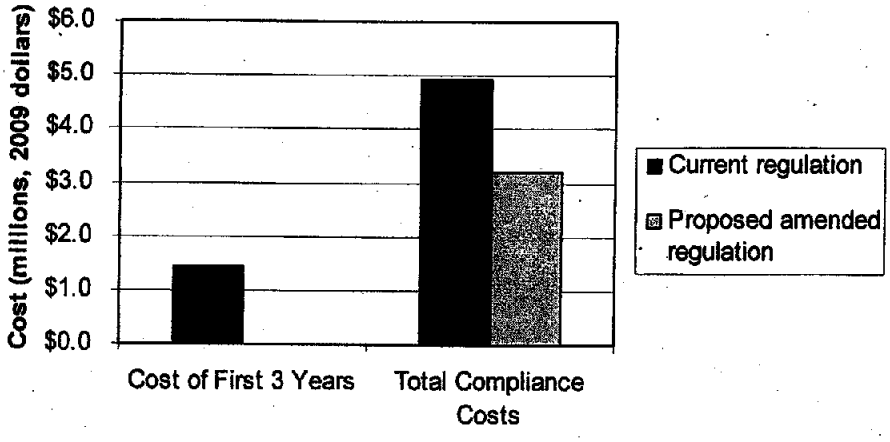
For a fleet that has reduced its activity, but has not performed any early vehicle replacements or retirements, the fleet would not have received early credits under the current regulation and would have experienced compliance costs over the initial three years of nearly $3.8 million. However, with the legislatively directed amendments, this same example fleet would now accrue enough early credits to eliminate its compliance requirements in 2010 and 2011, reducing compliance costs over the first three years to about $900,000. This reduction in requirements would reduce the fleet's compliance costs by 76 percent during the first three years of the regulation, while not appreciably reducing the fleet's overall compliance costs.

Similarly, if the example fleet had not reduced its activity, but instead had retired 50 percent of its hp between March 1, 2006, and March 1, 2009, under the current regulation, that fleet would receive early NOx credit only for the Tier 0 vehicles retired, and only if the fleet had retired over 24 percent of its total horsepower over that same period. In other words, only the Tier 0 vehicles retired above this 24 percent threshold would have generated early credit towards the NOx BACT requirements (but not the PM BACT requirements). However, under the proposed amendments, this fleet would now receive both NOx and PM BACT credit for all of the vehicles retired. As shown in Table 6 and Figure 4, for this example fleet, under the proposed amendments there would be no compliance costs for the first three years of the regulation compared to over $1.4 million in compliance costs under the current regulation. Overall, the total compliance costs would be reduced by 35 percent.

Table 6: Costs for a Fleet with Reduced Hp

Scenario	Compliance Costs for First Three Years of Regulation (2009 dollars)	Total Compliance Costs Over Entire Regulation (2009 dollars)[4]
Current regulation with reduced hp	$1,435,000	$4,924,000
Proposed amended regulation with reduced hp	$0	$3,202,000

Figure 4: Costs for a Fleet with Reduced Hp[5]



As shown in the scenarios above, if fleets have been severely affected by the current recession, they may be able to minimize the cost of the regulation in its initial years by taking advantage of the proposed amendments to reduce their compliance requirements, especially in 2010 and 2011.

The proposed amendments may also reduce a fleet's overall compliance costs for several other reasons. First, they may decrease costs by allowing fleets to defer compliance costs to later years using later year dollars (i.e., the present value of their compliance costs will be lower). Second, if fleets postpone their compliance requirements by utilizing the new credits to comply in the early years of the regulation, they may be required to take fewer or less expensive actions on their vehicles than originally estimated. For example, a large fleet may have planned to purchase several Tier 3 vehicles and retrofit them with VDECS for their 2010 compliance date. However, if that fleet is not required to take any compliance actions for several years, they may be able to instead purchase newly available Tier 4 or Tier 4 interim vehicles. By enabling fleets to purchase Tier 4 vehicles instead of Tier 3 vehicles, the proposed amendments may allow fleets to perform fewer actions in future years (such as replacing vehicles) to meet the fleet average target. As such, the proposed amendments will likely allow many fleets to reduce their total compliance costs.

C. Additional Incentives for Early Actions

The additional incentives for early action are also expected to result in some long-term cost savings to fleets that take advantage of them. However, because staff cannot predict with certainty how many fleets will take advantage of the new incentives for early action, it cannot estimate the total dollar savings that will result. However, qualitative assessments of the possible cost savings are described below.

[5] Note that the proposed amended regulation cost for the first three years is $0 (2009 dollars).

1. *Vehicles retrofitted early are exempt from future turnover*

If fleets claim an exemption from future turnover for the installation of retrofits prior to March 1, 2011, some cost savings may result from not having to turn over specific vehicles in a fleet. For example, repowering an older 300 hp dozer with a new engine would cost approximately $81,000, while retrofitting that same vehicle would only cost $18,000[6] (ARB, 2007b). Therefore, if a fleet is able to retrofit a vehicle and never replace it, it may result in a saving of approximately 78 percent for that vehicle.

However, use of this new provision would not always result in an overall cost savings to a fleet. This is because the number of vehicles eligible for the turnover exemption is capped at 15 percent of the fleet's horsepower. Thus, a fleet cannot use the new provision to exempt all its vehicles from future turnover. Because the fleet average requirements still take into consideration vehicles exempted from the turnover requirements, the fact that one vehicle is exempt from turnover may mean the fleet is required to take additional actions on other vehicles instead. Hence, although the new provision would allow fleets to reduce compliance costs for an individual vehicle as described above, in some cases, it may not provide the fleet an overall savings in compliance costs.

2. *Double credit for early NOx retrofit*

Fleets that install NOx retrofits before March 1, 2011, will receive double credit for those installations. This double credit could reduce NOx compliance requirements significantly in the beginning years of the regulation, allowing fleets to spread out their NOx compliance costs. However, this proposed amendment may not decrease overall compliance costs for a fleet.

3. *Repower credit*

The proposed amendment to allow NOx carryover turnover credit for repowers may result in some savings to fleets. Similar to the double credit for early NOx retrofits amendment, if additional credit is received for these repowers, fleets may be able to spread out compliance costs in the early years of the regulation, but would have little impact on overall compliance costs for a fleet.

4. *Extension of credit for other PM retrofits before initial compliance date*

The proposed amendment to provide double credit for small and medium fleets that install highest level VDECS on their vehicles prior to March 1, 2012, may also result in some savings to fleets. The proposed amendment would give small and medium fleets additional time to receive double credit for the installation of retrofits, thereby allowing such fleets to spread out their costs in the later years.

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[6] This example uses the repower and retrofit costs used in the TSD (ARB, 2007b).

D. Other Proposed Amendments

As described further below, the proposed amendments to the definitions of nonprofit training center and forestry operations are expected to provide savings to the small number of affected fleets. All of other proposed amendments are not expected to result in any additional costs, or cost savings and therefore are not mentioned below.

1. Definition of nonprofit training centers (community colleges)

For community college training programs that were not already considered small fleets, the proposed amendment would result in a cost savings. If a community college program has an off-road vehicle training program, that grouping of vehicles would now constitute a small fleet, regardless of the fleet's total hp. These fleets would be able to delay their first compliance date from 2010 or 2013 to 2015 and would be exempt from all the regulation's NOx performance requirements, which will reduce overall compliance costs.

2. Definition of forest operations includes public agency fire prevention activities

The reclassification of vehicles owned by public agencies that are used for fire prevention activities will also provide cost savings to affected fleets. Because these vehicles would be reclassified as forest operations vehicles, they would become exempt from all of the performance requirements of the regulation. For the public agencies that own these types of vehicles, this exemption would result in a cost savings for the fleet, which could be significant for a particular fleet if it has a large number of these vehicles. Staff does not have an exact count of the vehicles that will be affected by this reclassification, but based on preliminary inventory data from affected agencies, estimates that statewide, this change would affect fewer than 500 vehicles.

E. Impacts on California Economy

The proposed amendments will not impose additional impacts on the economy, nor are they expected to adversely impact employment. The amendments are intended to allow fleets to spread out or lower their compliance costs (especially in 2010 and 2011), which are expected to make the regulation more affordable in its early years. If in turn, that leads fewer fleets to reduce employment as a result of the regulation, the amendments could benefit overall California employment.

Although these proposed amendments are not expected to adversely impact the economy overall, these modifications could have a negative economic impact on retrofit manufacturers and installers and firms that provide repowers because they would receive fewer orders in the next few years. However, the proposed amendments to provide incentives are intended to encourage early retrofitting and repowering, and could help mitigate potential impacts on retrofit and repower jobs and businesses.

F. Potential Impacts on Small Businesses

The proposed amendments would not impose any additional costs on small businesses. Instead, they may provide a benefit to them by allowing fleets to spread out or lower their compliance costs. While staff believes most small businesses are small or medium fleets, which have a first compliance date in 2015 or 2013, respectively, a few small businesses meet the regulation's definition of large fleet, which have their first compliance date in 2010.

Overall, large fleets that are small businesses would benefit most from the proposed amendments because of the credits they may accrue. However, medium and small fleets that have reduced their total horsepower since March 1, 2006, would be able to benefit from the amendments by accumulating credits for PM (small fleets) or PM and NOx (medium fleets) to offset their later compliance requirements. Medium and small fleets would benefit predominantly from the proposed retirement credit, as well as from the proposed exemption for vehicles that are retrofitted early and the proposed additional credit for early repowers and retrofits. The new reduced activity credit would not benefit medium and small fleets because it expires in 2011 before the first compliance dates for medium or small fleets.

Small fleets would not benefit from the other proposed amendments; however, medium and large fleets that are small businesses would be able to benefit from the other proposed modifications because they may help those fleets to spread out or lower their compliance costs.

G. Potential Impacts on Public Agencies

The proposed amendments would not impose any additional costs on public agencies; however, some cost savings are expected for public agencies that off-road vehicles that perform fire prevention activities.

Overall, because of the nature of the work performed by public agencies (road maintenance, etc.), it is not expected that many public fleets have appreciably reduced their total horsepower or activity. Therefore, public fleets may accrue little, if any, credit towards their required compliance actions, and would not benefit from most of the proposed amendments. Although the modifications to the BACT provisions may help spread out the compliance requirements for State, Federal, and larger municipal fleets between 2011 and 2013, it may not result in large cost savings since the overall BACT compliance actions required during that time period would remain the same as in the original regulation.

The other proposed amendments may benefit public agencies that are medium or large fleets because they are intended to allow fleets to spread out or lower their compliance costs, which are expected to make the regulation more affordable.

IV. ENVIRONMENTAL IMPACTS

This chapter describes the potential environmental impacts of the proposed amendments. This includes the legislatively directed amendments, the mitigation measures intended to help offset the loss in emission benefits due to the legislatively directed amendments, the inclusion of community college training programs as non-profit training centers, and the inclusion of public agency fire abatement equipment within the forestry operations definition. The other proposed amendments are clarifications only, and would not increase or decrease the estimated emissions benefits of the regulation. Therefore, they have not been included in staff's analysis.

A. Legal Requirements

The legal requirements applicable to the environmental impact analysis are the same as those presented in the original off-road TSD (ARB, 2007b). Please see Chapter IX.A. of the off-road TSD for a description of these requirements.

The results of the environmental impact analysis for the proposed regulation amendments are discussed in the sections below. Alternatives to the proposed amendments to the regulation are discussed in Chapter V of this report.

B. Air Quality Impacts of Proposed Amendments

Section 1 below discusses the air quality impacts of the legislatively directed amendments. Section 2 discusses the air quality impacts of the additional incentives for early action. Section 3 discusses the air quality impacts of the other proposed amendments to the regulation. Section 4 provides staff's overall assessment of all of the proposed amendments.

To put the air quality impacts discussed later in context, Table 7 below shows the emission reductions anticipated from the regulation, prior to any of the proposed amendments discussed in this report.

Table 7: Statewide NOx and PM Emission Reductions from the Current Regulation (tpd)

Emission Reductions	2010	2015	2020	2025
NOx Benefits of Regulation	13	30	48	20
PM Benefits of Regulation	2.3	6.9	5.2	2.9

1. Legislatively directed amendments

The legislatively directed amendments would allow many fleets to comply with the regulation by utilizing credit received under the new provisions, rather than taking actions to reduce emissions. Hence, the amendments would cause fleets to perform

fewer actions to reduce emissions than they otherwise would have. As a result, there will be less retirement of high-emitting vehicles, fewer repowers of vehicles with cleaner engines, and fewer installations of exhaust retrofits. Typically, the fewer actions that a fleet takes to reduce emissions, the older and higher emitting its vehicles will be. Therefore, staff anticipates that the legislatively directed amendments would have an overall negative impact on the emission reductions achieved by the regulation.

Staff recognizes that, due to the current economic recession, many fleets have retired vehicles and/or reduced their vehicle activity, thereby reducing their emissions. However, staff does not yet have adequate data on how the current economic recession has affected the thousands of fleets in California to determine whether the emission reductions due to activity reductions and retirement are currently large enough to offset the emission benefit losses due to the legislatively directed amendments. Nor can staff accurately determine how future economic changes will affect emissions relative to what was initially predicted by staff when analyzing the anticipated benefits of the regulation (ARB, 2007a). Due to the uncertainty regarding fleet activity, and credits that fleets may claim, staff cannot currently quantify the overall combined effect of the economy and the legislatively directed amendments on emissions. However, staff is examining the effects of the current economic conditions on California fleets and will report its findings as part of staff's October, 2009 update to the Board, as discussed further in Section C below.

The subsections below discuss the anticipated emission impact of each of the legislatively directed changes on emissions.

a) *Amendments to the BACT Schedule*

The proposed amendments to the BACT schedule from 2011 to 2013 would allow large fleets to perform fewer actions than are currently required in 2011 and 2012, but would require them to make up for any reduced compliance in those years by the 2013 compliance date. Under the legislatively directed amendments, large fleets could elect to take up to a 40 percent reduction from required compliance under the present regulation in 2011 and 2012, for both NOx and PM requirements, and, if a fleet elects to take such reductions, an 80 percent increase in actions required in 2013.

Although by 2013, overall emission reductions would be achieved under either the current regulation or the proposed amendments, under the proposed amendments, there would be a loss in emissions benefits in both 2011 and 2012; a loss which staff expects would correspond to the reduction in the BACT requirements in these years, or 40 percent.

Applying this change to the emissions reductions staff estimated in the TSD (ARB, 2007b)[7], the reduction in benefits can be seen in Figure 5 below.[8] .

[7] The TSD emissions estimates, which for consistency are cited in Table 7 and Figure 5 and utilized for the estimates in this report, did not include the effects of changing the small fleet

Figure 5: Effect of Proposed BACT Schedule Amendments on Emissions Benefits

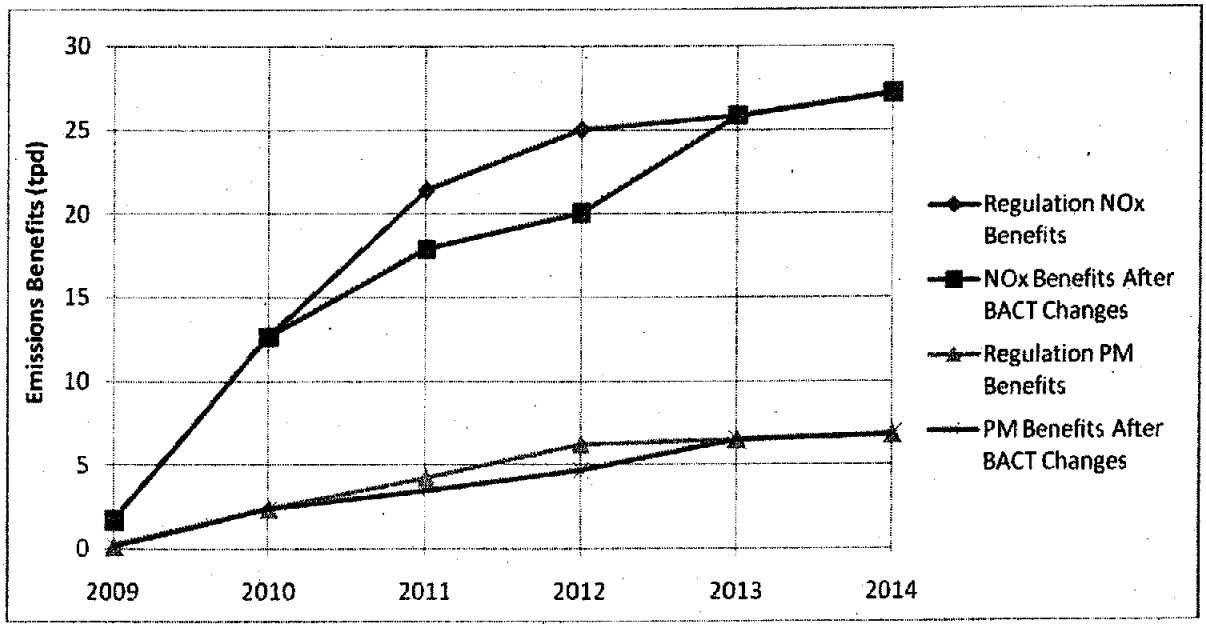

Table 8: Statewide Increase in Emissions in 2011 and 2012 from BACT Schedule Amendments

Year	PM (tpd)	NOx (tpd)
2011	0.7	3.5
2012	1.5	5.0

As shown in Figure 5 and Table 8 above, although fleets meeting the BACT requirements would be required to take fewer actions through 2012, they would be required to fully make up for this by the March 1, 2013, compliance date, and thereby achieve the emissions benefits expected in 2013 and beyond. The loss of emissions benefits shown by the gap in benefits above are substantial for 2011 and 2012, and would result in a near term impact on mortality. However there should be no long-term disbenefits in emissions from these BACT amendments, as long as fleets successfully are in full compliance with the 2013 requirements.

b) *Credit for reduced activity and retirements that reduce overall fleet hp*

Until staff receives more data from fleets on the level of activity reduction, the type and quality of records that fleets have maintained, and the distribution of activity reduction

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definition from 1,500 hp to 2,500 hp. However, this change made only a small change (less than 3 percent) to staff's overall benefit estimates.

[8] The emission benefit estimates in Figure 5 are only for the proposed change to the BACT schedule and do not include the effects of the new credits for retired hp or reduced activity.

among California's off-road fleets, the overall effect on emissions cannot be accurately quantified. However, individual, fleets that receive additional credit using either of the proposed provisions for reduced activity credit or vehicle retirement credit would be required to take fewer actions to meet the regulation's BACT requirements than are currently required. As an example of how a fleet's requirements could be lowered, the actions required before and after the legislatively directed amendments are shown below for an example fleet.

For the purposes of this example, consider a 10,000 hp fleet that retires 2,000 hp between 2006 and 2009, and experiences an additional 25 percent reduction in activity between July 1, 2007, and March 1, 2010, over their remaining 8,000 hp. This reduction in activity provides 25 percent of the remaining hp, or 2,000 hp, in credit. Table 9 summarizes the new credits awarded to the fleet per the proposed amendments.

Table 9: New Credits Awarded to Fleet

Credit	NOx and PM Credit (Hp)
Reduced Activity Credit	2,000
Retirement Credit	2,000
Total New Credits Awarded	4,000

As shown below in Figure 6 and Figure 7, after the first six years of the regulation, the fleet's turnover requirements have decreased by 3,280 hp and the fleet's retrofit requirements have decreased by 2,400 hp, when compared to the requirements prior to the legislatively directed amendments.

Figure 6: NOx BACT Requirements for an Example Fleet

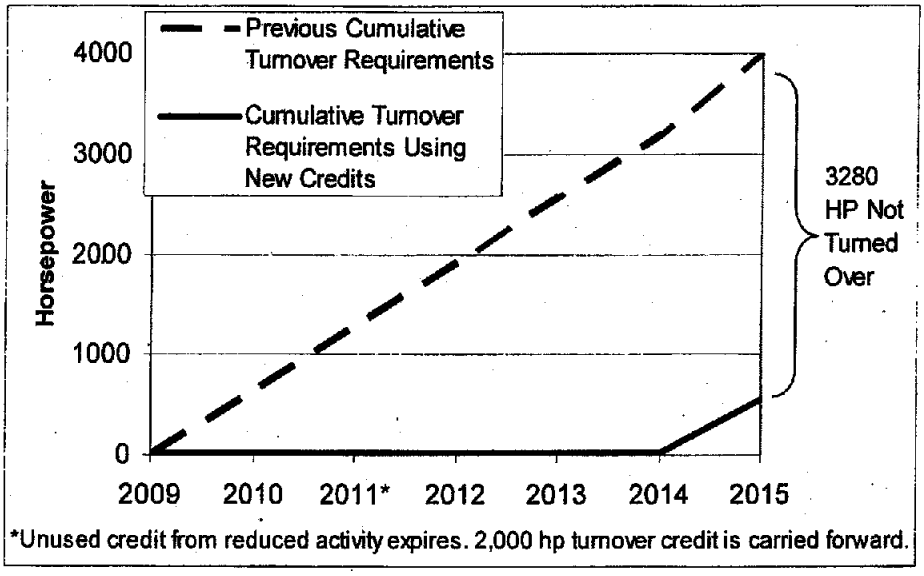
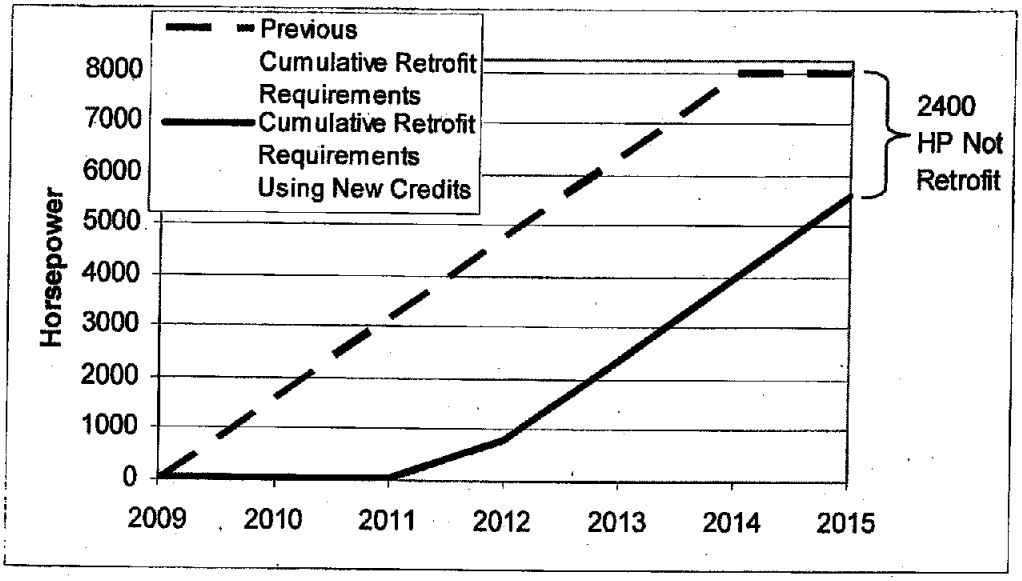


Figure 7: PM BACT Requirements for an Example Fleet



Because the example fleet has reduced activity as well as retired a significant portion of its hp, its emissions have been reduced from its previous 2006 levels[9]. However, the fleet's emissions are likely to be higher than they would have been in the absence of the proposed amendments. Also, the fleet is likely older and higher emitting than it would have been in the absence of the amendments. Hence, if the fleet's activity increases in the future as the economy rebounds, it will have significantly higher emissions than it would have had in the absence of those amendments. As fleets begin to report reduced activity (anticipated in Spring 2009), staff will have more data to analyze this effect.

2. *Additional Incentives for Early Action*

The effect on emissions from the three proposed amendments intended to spur early retrofitting - exempting vehicles retrofit early from future turnover, providing double credit for early NOx retrofits, and extending double retrofit credit for medium and small fleets – would provide early emission benefits and serve to offset the emission impacts of the legislatively directed amendments. However, the overall benefit of these proposed amendments will depend entirely on their appeal, and on how many additional retrofits and repowers fleets perform. The analysis described below therefore bounds the potential benefits.

a) *NOx retrofit double credit*

Based on the approximately 400 VDECS reported to date in the Diesel Off-road On-line Reporting System (DOORS) (DOORS, 2009), it is reasonable to assume that double credit for NOx amendments might spur roughly 400 additional retrofits. Additionally,

[9] Not all reduction in activity or retirements will reduce emissions. If a fleet retires their cleanest vehicles, and reduces activity, their overall emissions may still increase if they are using their older, dirtier vehicles substantially more.

after reviewing the applicability of the current VDECS which are verified to reduce NOx emissions, staff estimate that approximately 28,000 vehicles in the statewide off-road fleet fall into the hp range and model year range that could be retrofitted. To determine a reasonable upper bound, staff analyzed the early emissions benefit if large fleets responded to the new incentive by retrofitting 2 percent of their horsepower (about 2,800 vehicles). Staff assumed that these installations provided a NOx reduction of 40 percent[10].

Staff assumed the vehicles retrofitted were 250 hp on average, and were equivalent in age and emission factors to an average sample of the statewide fleet.

As summarized in Table 10 below, staff estimates that the double credit for early NOx retrofits could result in emission benefits of approximately 0.1 to 0.3 tpd PM and 0.5 to 3.2 tpd NOx.

Table 10: Possible 2010 Emissions Benefits from Proposed Double Credit for Early NOx Retrofits

	Additional Retrofits Installed	PM Benefits (tpd)	NOx Benefits (tpd)
Estimated Effect	400	0.05	0.5
Upper bound	2,800	0.34	3.2

When considering the proposed amendment's effect on emissions, fleets that take advantage of the credit would achieve early short term emissions benefits. However, in the long term, staff anticipates little change in overall emissions benefits due to the proposed NOx double retrofit credit. While fleets that receive the new NOx double credit would be able to delay other turnover in the future, based on the verified applicability of the only currently-verified NOx device[10], fleets with older, dirtier vehicles would not be able to install a NOx VDECS on a high percentage of their older vehicles. As a result, staff does not anticipate that older, dirtier fleets would be able to apply a NOx VDECS to a large enough portion of their fleet to accumulate enough credit to appreciably impact their turnover schedule or significantly increase their NOx emissions.

b) *Turnover e xemption for vehicles retrofit early*

As summarized in Table 11 below, the proposed turnover exemption for vehicles retrofitted early, and the extension of double retrofit credit for medium and small fleets could result in benefits between 0.1 and 0.3 tpd PM and 0.1 to 0.4 tpd NOx in 2010. The extension for medium and small fleets could also achieve benefits in future years, although this is not quantified in the table below. Staff's estimate of the early emissions benefits of the proposed amendment ranged from a lower bound of an additional 400 retrofits (the same as the analysis above) up to 2,800 retrofits (assuming all fleets retrofit approximately 1.5 percent of their vehicle inventory). For this analysis, as there

[10] Currently the only VDECS which is verified to reduce NOx emissions, the Cleaire Lonestar, is verified at 40 percent NOx reduction.

is currently only one retrofit device (of the eight devices verified to date) that is verified to reduce NOx emissions, staff assumed that only one in eight vehicles was retrofitted with a NOx reduction device.

Table 11: Possible 2010 Emissions Benefits from the Proposed Turnover Exemption for Retrofit Vehicles and Extended Double Credit

	Additional Retrofits Installed	PM Benefits (tpd)	NOx Benefits (tpd)
Estimated Effect	400	0.05	0.1
Upper bound	2,800	0.34	0.4

Staff assumed the vehicles retrofit were 250 hp on average, and were equivalent in age and emission factors to an average sample of the statewide fleet.

Although the exemption from turnover in the future would allow older vehicles to remain in the fleet throughout the course of the regulation, if the exemption is limited to no more than 15 percent of any fleet's hp, staff anticipates that fleets would meet the fleet average targets with increased turnover in the non-exempt portion of their fleet. Hence, the exemption from future turnover should not result in long term emissions disbenefits. An analysis of the possible emissions disbenefits of this proposed amendment, if its provisions are not limited, is discussed in the consideration of alternatives in Chapter V.

c) *Incentivizing Repowers*

In addition to incentivizing retrofits, staff is proposing to provide credit for repowers to fleets that, either because they are medium fleets or because they receive new credit due to the legislatively directed amendments, would no longer be required to take emissions reduction actions in 2010 or 2011.

Again, the emissions benefit in early years would depend on how many fleets take advantage of the new incentive. Table 12 provides an estimate of the emission benefits from the repower incentive if 500 additional vehicles were repowered.

Table 12: Possible 2010 Emissions Benefits from Proposed Repower Incentive

Additional Repowers Performed	PM Benefits (tpd)	NOx Benefits (tpd)
500	0.1	1.3

For the purpose of this analysis, staff assumed the average vehicle repowered was 300 hp, and repowered from a Tier 0 or Tier 1 engine to a Tier 2 engine. Additionally, staff assumed the average load factor was equivalent to the load factor of the most commonly repowered vehicle reported to ARB to date, scrapers, with a load factor of 0.72 (ARB, 2007b).

3. *Additional amendments to the regulation*

Staff analyzed the impacts of two additional amendments to the regulation - inclusion of community college training programs as non-profit training centers, and the inclusion of public agency fire abatement equipment within the forestry operations definition.

As described below, staff does not believe sufficient vehicles will be covered by these proposed provisions to have any quantifiable impact on emission reductions.

The addition of community colleges to the non-profit training center definition will mean some community college training programs that otherwise would have had to comply with the large or medium fleet requirements in 2010 or 2013, respectively, can now wait until 2015 to comply with the PM requirements of the regulation and would be completely exempt from the turnover requirements of the regulation. Therefore, the proposed amendment would likely result in less NOx reductions than otherwise expected. However, staff does not expect this impact to be significant. Although staff has not received complete inventory information from every community college training program in the state[11], it has determined that there are no more than 10 such programs (ARB, 2009a). Using the inventory data for three training programs that staff has been able to obtain, staff estimates there is no more than 30,000 hp total from the affected vehicles owned by such training programs. Given that the total hp of affected vehicles covered by the regulation is nearly 29 million, a change affecting less than 30,000 hp (approximately 0.1 percent of the total) is unlikely to have a measurable effect.

The change in the forestry definition would mean that vehicles owned by public agencies and used primarily for forest fire abatement or prevention would now be exempted from the off-road regulation. Such vehicles would instead be covered by a future control measure for agricultural off-road vehicles, if such a measure were adopted as planned. Although staff does not have complete inventory data regarding how many such vehicles there are, staff estimates that there are fewer than 500 such vehicles. Hence, this change is not expected to have a quantifiable impact on emissions.

C. Future Evaluation of Current Economic Conditions on Emissions

Staff recognizes that the current recession and downturn in the construction industry in particular, has reduced vehicle activity and thereby at least temporarily reduced emissions. Additionally, fleets may also have chosen to downsize in response to a decline in the economy. Some fleets choosing to reduce their fleet size due to economic hardship may have retained the older equipment and sold newer equipment; others may have sold their oldest equipment. Fleets may also have slowed or ceased their normal replacement of older vehicles with new in order to conserve capital. Each of these actions will have a different effect on emissions.

[11] Staff has requested fleet data from all such programs but as of May 2009 has received data from only three.

Staff is currently collecting data on California's off-road diesel vehicle inventory as fleets comply with the reporting requirements in the regulation, with thousands of vehicles being reported to ARB each week. However, because the reporting deadlines for small fleets will not occur until later this summer, current data is incomplete for a full analysis. Additionally, not all large fleets have yet reported their vehicle retirements over the past few years, which will provide additional information on recent changes in the state's off-road inventory. Nor have fleets yet reported data to ARB on their changes in vehicle activity.

Staff will continue to receive and compile fleet information as it is received, and will report its findings, including an assessment of how emissions have changed as a result of the current economic climate, to the Board in October, 2009.

D. Other Environmental Impacts

Staff does not believe there will be any additional environmental impacts from the proposed amendments to the regulation. Although several of the proposed amendments are intended to increase the early use of exhaust retrofits, and the use of exhaust retrofits can have impacts on fuel economy and hazardous waste generation, the overall use of retrofits is expected to be less than initially expected due to the legislatively directed amendments. Hence, any negative environmental impacts are expected to be less than described in the Technical Support Document for the regulation (ARB, 2007b). The overall benefit of retrofits, including fuel economy concerns and hazardous waste, is discussed in chapter IX of the Technical Support Document for the regulation (ARB, 2007b).

V. ALTERNATIVES CONSIDERED

This chapter discusses alternatives to the proposed amendments to the regulation. Section A discusses alternative methods of implementing the legislatively directed amendments, as well as alternatives to the proposed mitigation measures. When considering the legislatively directed amendments, staff did not consider alternatives that were inconsistent with the intent of AB 8 2X.

Section B discusses a number of alternatives to the proposed additional incentives for early actions considered by staff, and why staff rejected those alternatives in favor of those staff are proposing. Section C discusses alternatives to the proposed community college training program change considered by staff and why they were rejected. Because the other proposed amendments are clarifications or minor changes, staff did not perform an alternatives analysis for them.

A. Legislatively Directed Amendments

1. Revised BACT schedule

Staff considered implementing the BACT requirements as described by AB 8 2X without special provisions for fleets which met the fleet average targets in 2011 or 2012. However, without exempting fleets which met the fleet average targets in 2011 and/or 2012 from the increased BACT requirements in 2013, the legislatively directed amendments could potentially increase the stringency of the regulation for some fleets. Fleets meeting the fleet average targets in 2011 and 2012, but not in 2013, would have been required to turn over 8 percent of their hp and retrofit 20 percent of their hp to meet the 2013 BACT requirements under the current regulation. However, without including special provisions for these fleets, these same fleets would have had their 2013 BACT requirements increased to turning over 14.4 percent and retrofitting 36 percent of their hp. This would nearly double their requirements.

Staff does not believe it was the intent of the legislature to increase the stringency of the regulation for fleets in the early years of the regulation, especially not for the cleanest fleets (those meeting the fleet average targets). Therefore, staff chose to include language to prevent the BACT schedule amendments from increasing the requirements on fleets.

2. Additional credit for vehicle retirement

Although staff initially proposed crediting only the retirement of Tier 0 vehicles or Tier 0 and 1 vehicles that were not certified to a PM level, staff believes that crediting the retirement of all vehicles reducing overall hp, regardless of engine tier, is the option most consistent with the intent of AB 8 2X.

By limiting the credit to only Tier 0 vehicles, this provision would have limited credit to only those fleets that had retired their oldest vehicles, thereby decreasing their emissions and fleet average emission rates. This limitation would have been consistent

with the current provisions in the regulation for the early retirement of Tier 0 vehicles in fleets that have reduced hp (section 2449.2(a)(2)(A)1.b.). This interpretation would have been equivalent to extending the current credit for the retirement of Tier 0 vehicles back by 3 years (from March 1, 2009, back to March 1, 2006).

At the initial workshop on April 7, 2009, to discuss the proposed amendments, staff received feedback that the provision should allow fleets that had retired all of their Tier 0 vehicles to receive credit for the retirement of Tier 1 vehicles as well, because these retirements would remove the dirtiest vehicles remaining in the fleet. To not allow credit for retirement of such Tier 1s would unfairly penalize cleaner fleets. Staff agreed that crediting the retirement of Tier 1 vehicles, in a fleet that did not have Tier 0 vehicles, was consistent with awarding credit for actions which would decrease the average emissions from the fleet.

At the second workshop on April 29, 2007, staff proposed allowing credit for all Tier 0 retirements and Tier 1 retirements in fleets with no Tier 0s. However, staff received additional feedback from fleets that, because section 2449.1(a)(2)(A)2.a.ii. of the regulation only offered credit for early vehicle retirements if such retirements exceeded eight percent per year on average from 2006 to 2009, some fleets had delayed the retirement of their Tier 0 vehicles in order to receive credit for the retirements after March 1, 2009, while retiring higher tiered vehicles first. As such, any limit on the credit by vehicle tier would unfairly prevent any credit being awarded to fleets that had retained Tier 0 vehicles due to provisions in the current regulation.

Staff also received a letter from a number of legislators indicating that the legislative intent of the AB 8 2X retirement credit was to apply to retirement of all vehicles regardless of tier (Assembly, 2009; Senate, 2009). After reviewing all the feedback, staff concluded that crediting the retirement of all vehicles reducing overall hp, regardless of vehicle tier, from March 1, 2006 to March 1, 2010, is the most appropriate approach consistent with the intent of AB 8 2X.

3. Reduced activity credit

a) Determining average annual use

Although staff considered other length time periods for determining activity, staff concluded that a 12-month period was the most accurate and representative interpretation of AB 8 2 X. As shown in Appendix A, AB 8 2X states that reduced activity is defined by the "average annual hours" for vehicles in the fleet, as determined on July 1, 2007, and March 1, 2010. As the average annual hours of use cannot representatively be determined by the use on a single day, staff had to determine the most appropriate annual period for determining fleet activity on the above dates. The average annual hours could be defined by a period shorter than a year, but such a shorter period would not accurately depict annual activity. For example, using June through August of 2007 as the baseline period would exaggerate the baseline activity as summer months are historically more active months than an annual average for the construction industry, the industry most heavily affected by the regulation. Hence, staff

concluded a 12-month period was the most appropriate way to capture the seasonal nature of the construction industry.

b) *Dates used to determine baseline activity period*

Initially, staff proposed to determine the average annual use for July 1, 2007, as the twelve month period beginning July 1, 2007, and ending on June 30, 2008, and the average annual use for March 1, 2010 as the twelve month period beginning March 1, 2009, and ending on February 28, 2010. This interpretation would be consistent with the AB 8 2X language which states "reduced activity between July 1, 2007, and March 1, 2010" as both of these periods are included between these dates. At the initial workshop, however, fleets expressed concern that beginning the initial period on July 1, 2007, would not provide them with the credit intended by the legislature as many in the construction industry had experienced periods of higher activity prior to July, 2007.

Staff therefore amended the initial twelve month period to center on July 1, 2007, instead of beginning on that date. By centering the twelve month period on July 1, 2007, staff believes the provision more accurately captures the activity average on July 1, 2007, rather than an average of the twelve months after that date.

Several fleets and construction industry members requested that the initial period be determined by the twelve month period ending on July 1, 2007. Staff considered this method, but does not agree that the twelve months ending on July 1, 2007, capture the average annual activity as of that date any more so than the twelve months beginning on July 1, 2007. Defining the initial period as August, 2006, to July, 2007, most accurately captures the fleet average annual hours of January, 2007, and not July, 2007, which would not be consistent with the language in AB 8 2X.

c) *Dates used to determine final activity period*

In order to be consistent with baseline activity period, staff considered using the twelve month period centered on March 1, 2010, to determine the average annual activity of that date. While this would be the most accurate way to determine the activity on March 1, 2010, and would be consistent with the recommended method for determining the baseline activity, staff recognizes that many fleets will be using the credits to meet the March 1, 2010, BACT requirements. As such, in order to provide certainty to fleets regarding their compliance requirements, the period to determine the credit provided cannot reasonably extend past that initial compliance date for large fleets. While the regulation could provide credit based on an initial estimate of the activity for this period, and then later provide a correction in the 2011 requirements if activity did not match the estimate, this would become both extremely complicated and could unexpectedly increase the stringency of the regulation for fleets in 2011 if their activity increased in 2010. On reviewing the available options, staff considered the twelve months ending on March 1, 2010, to be the best option to meet the intent of AB 8 2X and still be workable for fleets.

d) *Including v ehicle hp in activity calculations*

As AB 8 2X does not include mention of vehicle hp when defining reduced fleet activity, staff briefly considered not including hp when calculating vehicle activity. However, not including the hp could provide the same credit to a fleet that reduced their activity on a 2,700 hp mining truck as a fleet that reduced activity on a 35 hp riding mower. Alternatively, a fleet could lower their use of the 2,700 hp mining truck, and increase the use of the 35 hp riding mower, and receive no credits. Staff does not believe that would be equitable or consistent with the intent behind the legislatively directed amendments.

e) *Demonstrating reduced activity using fleet records*

Staff ultimately crafted a proposal that allows fleets with records allowing a vehicle-by-vehicle determination of baseline and final activity to receive as much reduced activity credit as they can document. Staff's proposal also attempts to ensure that inappropriate credit is not unfairly awarded to fleets that have not actually reduced activity, but at the same time allows fleets which cannot substantiate specific vehicle reductions to receive some credit. Staff considered a wide range of possibilities when considering how fleets could submit a document of reduced activity. After receiving feedback during the workshops, and from advisory group and industry representatives, staff considered several different options:

- **Credit Only for Fleets with Hour Meter Logs for Each Vehicle:** Staff considered requiring fleets to provide logs showing readings from hour meters for every vehicle in the fleet in order to receive reduced activity credit. However, based on informal polling at the workshops held to discuss the proposed amendments, staff estimated that a quarter or less of the fleets affected by the regulation have hour meters installed on each vehicle, not to mention logs of the readings dating back to 2007. Requiring such logs would prevent many fleets that have legitimately reduced activity from receiving credit.
- **Full Credit for Fleets with Any Indicator of Reduced Activity:** Staff considered allowing fleets that could demonstrate any indicator of reduced activity to receive full credit. For example, a fleet that had decreased total employment by 40 percent from 2007 to 2010 might receive 40 percent of their hp as credit under this rejected alternative. However, such a provision would not necessarily properly award credit for reduced activity, in that, for example, a fleet may have reduced their employment by laying off workers that do not operate vehicles. Staff also rejected decreased revenue as an indicator of reduced activity, in that a fleet may have maintained a constant level of operational activity but experienced decreased revenue as a result of operating with decreased profit margins. Ultimately, staff determined that allowing uncapped credit to fleets for any indicator of reduced activity would provide more credit than was appropriate as fleets could choose which indicator could provide them with the most credit, even if they had more accurate vehicle data.

4. Combination of credits for reduced activity and early retirement

To avoid double counting vehicle retirements as reduced activity, staff considered requiring fleets to choose between reduced activity credits and retirement credits. The

example below illustrates why allowing fleets to count both reduced activity and vehicle retirement would inappropriately double the amount of credit given for the same action.

Example fleet:
Consider a 100,000 hp fleet that retires 30,000 hp of Tier 0 equipment in 2008. These retirements lead to a 30 percent reduction in activity. (For the example, we assume the vehicles retired are of average hp for the fleet and were of average hours used in 2007 compared to the other vehicles.) The emission reductions achieved by the fleet are approximately equal to if they had reduced to zero the emissions of 30 percent of their fleet.

Retired Hp Credit for PM and NOx: 30,000 hp
Reduced Activity Credit: 30% x 100,000 hp = 30,000 hp

If allowed to combine their credits, the fleet would gain:
60,000 hp total credit for PM and NOx for retiring 30,000 hp

In other words, the fleet would receive credit for the same action twice (60,000 hp credit for an action that reduced emissions from 30,000 hp vehicles). This would be equivalent to 86 percent of the fleet's final hp (60,000 hp/70,000 hp). Staff believes that allowing the fleet to accumulate 60,000 hp credit in the example above would incorrectly double count and overstate the emission reductions actually achieved.

At the workshops, staff received comment that some fleets had experienced both reduced activity and retirements, in separate portions of their fleet. Staff agreed that crediting reduced activity in the portion of the fleet which was not retired would prevent double counting while providing appropriate credit to such fleets and hence adjusted staff's proposal to allow this.

B. Additional Incentives for Early Action

1. Extension or increase of double retrofit credit

To incentivize additional retrofits, staff considered triple retrofit credit and proposing an extension to the period for double PM retrofit credit for large fleets, which currently is scheduled to end on January 1, 2010. While the idea was appreciated by those fleets that had already planned to retrofit vehicles for double credit, staff received mixed feedback as to the anticipated effectiveness of providing more than double retrofit credit or extending double credit.

In the end, staff rejected triple credit or further extension of double PM credit for large fleets for the following reasons. First, it would reduce the retrofit requirements for large fleets that would not receive credit per the legislatively directed amendments and would have to install retrofits in the early compliance years. For example, if a fleet would already be required to install retrofits in 2011, giving double credit for those retrofits would provide no further incentive to that fleet but instead would simply allow that fleet to delay further retrofitting. Second, if the provisions for double retrofit credits were

extended for several years, large fleets would lose the incentive to retrofit early to receive double credit, as they would be able to delay retrofitting several years and still receive double credit. Finally, staff was hesitant to extend double retrofit credit or put in place triple retrofit credit because both could lead to long-term emission disbenefits as described further below. For these reasons, staff does not recommend triple retrofit credit or further extension of double retrofit credit for large fleets.

To demonstrate how triple credit could reduce long term emissions benefits, staff analyzed the effect of a fleet that retrofits 100 vehicles in 2010 (and receives triple credit (i.e., credit for 300 retrofits), and compared it to the emissions benefits that would be achieved if that same fleet actually retrofitted 300 vehicles in 2012, shown in Table 13. To simplify the example, one retrofit is assumed to remove one "unit" of emissions per year. As Table 13 shows, although there is an initial emission benefit for this fleet to retrofit early (greater cumulative benefits in 2010 and 2011), by 2012, the cumulative benefits are equal, and for all years after 2012, the cumulative emission benefits are greater for the later installation of 300 retrofits.

Table 13: Emissions Benefit Comparison for Triple Retrofit Credit

Number of Actual Retrofits Installed	Annual Benefits (units)					Cumulative Benefits (units)				
	2010	2011	2012	2013	2014	Through 2010	Through 2011	Through 2012	Through 2013	Through 2014
100	100	100	100	100	100	100	200	300	400	500
300	0	0	300	300	300	0	0	300	600	900

Staff does not find this same reasoning to apply to medium or small fleets that must comply no sooner than 2013 and 2015, respectively, and is proposing an extension of double credit for these fleets. In contrast to large fleets, in 2011 and 2012, small and medium fleets are not subject to compliance in these years, and the providing of double credit to them would not adversely delay scheduled compliance. Additionally, the extension of double credit would assist medium and small fleets in complying with the regulation and provide flexibility to these smaller fleets that do not benefit from the credit for reduced activity, which expires in 2011.

2. Minimum BACT requirements for fleets awarded credit under new provisions

At the initial workshop, staff received the comment that fleets using the new credit should be required to meet at least a minimal portion of the BACT requirements. That is, they should be required to do a certain percent retrofitting and a certain percent turnover per year, regardless of what new reduced activity and retirement credits they have. According to the commenter, the new credits should not exempt any fleet completely from taking actions to clean up their fleets during the initial few years of the regulation.

Staff performed an analysis of the likely emissions benefits that would result from maintaining minimum BACT requirements for those fleets using the new credits. For this analysis, staff assumed that fleets using the new credits would be required to complete half of the adopted initial BACT requirements (i.e., four percent turnover, and 10 percent retrofits). Staff concluded that such minimum BACT requirements could indeed mitigate by 50 percent the potential loss in emission benefits from the legislatively directed amendments (as discussed in Chapter IV.B.1 above). Staff, however, did not propose the suggested minimum BACT requirements finding such a requirement to be inconsistent with the intent of AB 8 2X to provide needed relief to affected fleets during the current economic downturn.

3. Increase the stringency of the regulation to compensate for relief provided

Staff received the suggestion to increase the BACT requirements in the regulation in 2013 and 2014 for all fleets that took advantage of the new credits. While this approach could prevent any emission benefits losses from the new credits from 2014 and later, staff is not proposing it as part of the amendments described in this report because it could push annual compliance costs in 2013 and 2014 to levels that would not be affordable to many fleets. Additionally, staff believes that the proposal is inconsistent with the intent of AB 8 2X.

C. Other Amendments

As discussed in Chapter II, staff proposes to amend the definition of Non-Profit Training Center to include community college off-road vehicle training programs (community college programs) in order to lower potential compliance costs for such programs and give such programs more time to comply. When considering how to provide relief to the community college programs, staff considered including them in the exemption for job corps training centers in section 2449(e)(13) of the regulation rather than defining them as Non-Profit Training Centers. Section 2449(e)(13) completely exempts job corps training centers from all of the regulation's requirements except for reporting and labeling. Hence, if community college programs had been added to section 2449(e)(13), they would have been exempted from all of the turnover and retrofitting requirements of the regulation.

Staff opted to include the community college programs in with the Non-Profit Training Centers to (1) better maintain the emission benefits of the regulation, (2) maintain consistency between community college programs and very similar programs run by labor unions, and (3) encourage community college programs to obtain exhaust retrofits and thereby provide training to their students in the use and maintenance of retrofits. Because exhaust retrofits are expected to become commonplace in the future, having some exposure to the use of such retrofits would be useful to community college students who wish to become future equipment operators.

VI. REFERENCES

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APPENDIX A: AB 8 2X LANGUAGE

Assembly Bill No. 8

CHAPTER 6

An act to amend Section 11011 of the Government Code, to add Section 43018.2 to the Health and Safety Code, to add and repeal Sections 21080.41 and 21080.42 of the Public Resources Code, and to add Section 130240.5 to the Public Utilities Code, relating to state government.

[Approved by Governor February 20, 2009. Filed with Secretary of State February 20, 2009.]

LEGISLATIVE COUNSEL'S DIGEST

SEC. 2. Section 43018.2 is added to the Health and Safety Code, to read:

43018.2. (a) The state board shall amend Sections 2449.1 and 2449.2 of Title 13 of the California Code of Regulations to do both of the following:

(1) Modify the nitrogen oxides (NOx) and particulate matter (PM) best available control technology requirements to allow a fleet to achieve its cumulative turnover and retrofit requirements for the years 2011 to 2013, inclusive, by completing 20 percent of its cumulative turnover and retrofit obligations in 2011, an additional 20 percent in 2012, and the balance in 2013.

(2) (A) Modify the nitrogen oxides (NOx) and particulate matter (PM) credit provisions to reflect vehicle retirements that reduce total fleet horsepower between March 1, 2006, and March 1, 2010, and reduced activity between July 1, 2007, and March 1, 2010.

(B) "Reduced activity" for the purposes of this paragraph means the percentage reduction in the average annual hours of operation of the off-road fleet. That percentage shall be carried forward as a credit for nitrogen oxides (NOx) and particulate matter (PM) to offset the annual percentage reductions required for 2010 and 2011. The credit shall not be used to meet any obligations beyond 2011.

(b) The amendment of regulations required by this section is exempt from the Administrative Procedure Act (Chapter 3.5 (commencing with Section 11340) of Part 1 of Division 3 of Title 2 of the Government Code).

APPENDIX B: PROPOSED REGULATION ORDER FOR IN-USE OFF-ROAD DIESEL-FUELED FLEETS

Note: Proposed modifications are shown in underline to indicate additions and ~~strikeout~~ to indicate deletions, compared to the preexisting regulatory language. Modifications that were proposed at the January Board hearing are shown in **bold underline** to indicate additions and **bold ~~strikeout~~** to indicate deletions, compared to the preexisting regulatory language. The symbol "*****" indicates that regulatory language not being amended is not shown.

Amend sections 2449, 2449.1, and 2449.2, title 13, California Code of Regulation to read as follows.

§ 2449 General Requirements for In-Use Off-Road Diesel-Fueled Fleets

*****

(c) Definitions

*****

(26) ***"Forest operations"*** means (A) forest fire prevention activities performed by public agencies, including but not limited to construction and maintenance of roads, fuel breaks, firebreaks, and fire hazard abatement or (B) cutting or removal or both of timber, other solid wood products, including Christmas trees, and biomass from forestlands for commercial purposes, together with all the work incidental thereto, including but not limited to, construction and maintenance of roads, fuel breaks, firebreaks, stream crossings, landings, skid trails, beds for falling trees, fire hazard abatement, and site preparation that involves disturbance of soil or burning of vegetation following forest removal activities. Forest operations include the cutting or removal of trees, tops, limbs and or brush which is processed into lumber and other wood products, and or for landscaping materials, or biomass for electrical power generation. Forest operations do not include conversion of forestlands to other land uses such as residential or commercial developments.

(27) "Highest Level Verified Diesel Emission Control Strategy" (VDECS) means the highest level VDECS verified by ARB under its *Verification Procedure, Warranty and In-Use Compliance Requirements for In-Use Strategies to Control Emission from Diesel Engines* (*Verification Procedure*), title 13, CCR, sections 2700-2710, for a specific engine as of 10 months prior to the compliance date, which (1) can be used without impairing the safe operation of the vehicle as demonstrated per section 2449(e)(8), and (2) the diesel emission-control strategy manufacturer and authorized diesel emission-control strategy dealer agree can be used on a specific engine and vehicle combination without jeopardizing the original engine warranty in effect at the time of application.

Plus designations do not matter; that is, a Level 3 Plus is the same diesel PM level as Level 3; and Level 2 Plus is the same diesel PM level as Level 2.

The highest level VDECS is determined solely based on verified diesel PM reductions, not based on verified NOx reductions. All Level 3 diesel PM devices are higher than all Level 2 diesel PM devices. Level 1 devices are never considered highest level VDECS for the purpose of this regulation.

(28) ***"Hour Meter Log"*** means a log of the hours that a vehicle operated directly taken from the vehicle's hour meter.

(2928) ***"Implement of husbandry"*** is as defined in California Vehicle Code (Veh.Code) division 16.

(3029) ***"Local Municipality"*** means a city, county, city and county, special district, or other public agency, or two or more public entities acting jointly, or the duly constituted body of an Indian reservation or rancheria. Agencies of the United States of America or the State of California, and departments, divisions, public corporations, or public agencies of this State or of the United States are not considered local municipalities.

(3130) ***"Low-Population County Local Municipality Fleet"*** means a fleet owned by a local municipality (as defined above) that is located in a county as defined in title 13, CCR, section 2022(b)(2) and identified in section 2022(c)(2), Table 2, or, using the criteria set forth in title 13, CCR, section 2022.1(c)(4), a local municipality not located in a low-population county that has requested and has received Executive Officer approval to be treated like a municipality in a low-population county. Fleets owned by such local municipalities shall be treated as small fleets even if their total maximum power exceeds 2,500 horsepower.

(3231)***"Low-use vehicle"*** means a vehicle that operated in California less than 100 hours during the preceding 12-month period running from March 1 to end of February. For example, when reporting in 2009, the hours of use between March 1, 2008 and February 28, 2009 would be used to determine low-use status. To be considered a low-use vehicle, the fleet owner must submit engine operation data from a functioning non-resettable hour meter.

(A) **Vehicles used outside California** - Vehicles that operate both inside and outside of California can meet the low-use vehicle definition if they are used less than 100 hours per year in California.

(B) **Three-year rolling average** - A vehicle operated only in California for the previous three years and owned by the same owner during that period will be considered low-use if it operated on average less than 100 hours per year during that previous three-year period.

(C) **Emergency operation hours** - Hours used for emergency operations are not counted when determining low-use status.

(3332) "Maximum power" (Max Hp) means the engine's net horsepower or net flywheel power certified to Society of Automotive Engineers (SAE) Method J1349 or International Organization for Standardization (ISO) Method 9249. If the engine's net horsepower or net flywheel power certified to SAE Method J1349 or ISO Method 9249 is not readily available, another net horsepower or net flywheel power from the manufacturer's sales and service literature or horsepower from the engine label may be used.

(3433) "Model year" has the same meaning as defined in title 13, CCR, section 2421(a)(37).

(3534) "Motor vehicle" has the same meaning as defined in Veh. Code section 415.

(3635) "New fleet" means a fleet that is acquired or that enters California after March 1, 2009. Such fleets may include new businesses or out-of-state businesses that bring vehicles into California for the first time after March 1, 2009.

(3736) "NOx index" means an indicator of a fleet's overall NOx emission rate. The NOx Index for a specific fleet is determined by summing the product of the maximum power of each engine times the NOx Emission Factor, and dividing by the fleet's total maximum power.

(3837) "NOx target rate" means the NOx fleet average that a specific fleet must meet in a compliance year in order to show compliance with the fleet average requirements. The NOx Target Rate varies depending on a fleet's horsepower distribution. The NOx Target Rate for a specific fleet for each compliance year is determined by summing (adding) the product of the maximum power (Max Hp) of each engine times the NOx target, and dividing the resulting sum by the fleet's total maximum power.

(3938) "Non-Profit Training Center" means an entity that operates a program for training in the use of off-road vehicles and that (A) is a community college program that trains students in the use of off-road vehicles or (B) qualifies as a non profit or not for profit organization under title 26 Internal Revenue Code section 501(a), (c)(3), (c)(5), or (c)(6). Any vehicles that are not used for an off-road training program are not considered part of a non-profit training center and must be considered a separate fleet.

(4039) "Off-highway vehicle" is defined in Veh. Code division 16.5.

(41) "Operator Log" means a log of the hours that a vehicle operated taken from records of vehicle operator hours.

(4240) "Oxides of nitrogen" (NOx) means compounds of nitric oxide, nitrogen dioxide, and other oxides of nitrogen. Nitrogen oxides are typically created during combustion processes and are major contributors to smog formation and acid deposition.

(4341) "Post-2007 Flexibility Engine" means an engine certified on or after January 1, 2007 to the implementation flexibility standards in title 13, CCR, section 2423(d). Such flexibility engines are generally labeled as follows by the engine manufacturer:

> "THIS ENGINE COMPLIES WITH CALIFORNIA EMISSION REQUIREMENTS UNDER 13 CCR 2423(d)..." or
> "THIS ENGINE CONFORMS TO CALIFORNIA OFF-ROAD COMPRESSION-IGNITION ENGINE REGULATIONS UNDER 13 CCR, 2423(d)."

Post-2007 flexibility engines should use the emission standard to which the engine is certified. For example, a Tier 4 engine flexed back to Tier 2 emission levels should use the Tier 2 PM standard in title 13, CCR, section 2423(b)(1)(A) as the emission factor (converted from grams per kilowatt hour (g/kW-hr) to g/bhp-hr by multiplying by 0.746).

(4442) "Queuing" means the intermittent starting and stopping of a vehicle while the driver, in the normal course of doing business, is waiting to perform work or a service, and when shutting the vehicle engine off would impede the progress of the queue and is not practicable. Queuing does not include the time a driver may wait motionless in line in anticipation of the start of a workday or opening of a location where work or a service will be performed.

(4543) "Registered and driven safely on-road" means a vehicle meets the requirements to be registered for on-road operation in Veh. Code division 3, chap. 1, article 1, sections 4000 et seq. (i.e., required to be registered or could be registered), and the requirements to be driven safely on-road in "Equipment of Vehicles" requirements in Veh. Code division 12, chap. 1, sections 24000 et seq. and "Size, Weight, and Load" requirements in Veh. Code division 15, sections 35000 et seq. Having a California Special Construction Equipment plate as defined in California Veh. Code sections 565 and 570 does not constitute registration.

(46) "Replacement" means the addition of off-road diesel vehicles to a fleet that had retired one or more off-road diesel vehicles of an equivalent horsepower.

(4744) "Repower" means to replace the engine in a vehicle with another engine meeting a subsequent engine emissions standard (e.g., replacing a Tier 0 engine with a Tier 2 or later engine).

(4845) "Responsible Official" means one of the following:

(A) For a corporation: A president, secretary, treasurer, or vice president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation,

(B) For a partnership or sole proprietorship: a general partner or the proprietor, respectively

(C) For a municipality, state, federal, or other public agency: either a principal executive officer or ranking elected official. For the purposes of this part, a principal executive officer of a federal agency includes the chief executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., a Regional Administrator of the U.S. EPA).

(4946) "Retire" means to take an engine out of service and not operate it again in the State of California. To retire an engine, the vehicle with the engine may be moved outside of California, sold, or scrapped.

(5047) "Snow removal operations" means removing snow from public roads, private roads, or driveways.

(5148) "Specialty vehicle" means a vehicle for which no used vehicle with a cleaner engine that can serve an equivalent function and perform equivalent work is available.

(5249) "Tier 0 Engine" means an engine not subject to the requirements in title 13, CCR, section 2423; Title 40, Code of Federal Regulations (CFR), Part 89; or Title 40, CFR, Part 1039.

(5350) "Tier 1 Engine" means an engine subject to the Tier 1 new engine emission standards in title 13, CCR, section 2423(b)(1)(A) and/or Title 40, CFR, Part 89.112(a). This also includes engines certified under the averaging, banking, and trading program with respect to the Tier 1 Family Emission Limits (FEL) listed in title 13, CCR, section 2423(b)(2)(A) and/or Title 40, CFR, Part 89.112(d).

(5451) "Tier 2 Engine" means an engine subject to the Tier 2 new engine emission standards in title 13, CCR, section 2423(b)(1)(A) and/or Title 40, CFR, Part 89.112(a). This also includes engines certified under the averaging, banking, and trading program with respect to the Tier 2 FEL listed in title 13, CCR, section 2423(b)(2)(A) and/or Title 40, CFR, Part 89.112(d).

(5552) "Tier 3 Engine" means an engine subject to the Tier 3 new engine emission standards in title 13, CCR, section 2423(b)(1)(A) and/or Title 40, CFR, Part 89.112(a). This also includes engines certified under the averaging, banking, and trading program with respect to the Tier 3 FEL listed in title 13, CCR, section 2423(b)(2)(A) and/or Title 40, CFR, Part 89.112(d).

(5653) "Tier 4 Final Engine" means an engine subject to the final after-treatment-based Tier 4 emission standards in title 13, CCR, section 2423(b)(1)(B) and/or Title 40, CFR, Part 1039.101. This also includes engines certified under the averaging, banking, and trading program with respect to the Tier 4 FEL listed in title 13, CCR, section 2423(b)(2)(B) and/or Title 40, CFR, Part 1039.101.

(5754) "Tier 4 Interim Engine" means an engine subject to the interim Tier 4 emission standards (also known as transitional) in title 13, CCR, section 2423(b)(1)(B) and/or Title 40, CFR, Part 1039.101. This also includes engines certified under the averaging, banking, and trading program with respect to the Tier 4 FEL listed in title 13, CCR, section 2423(b)(2)(B) and/or Title 40, CFR, Part 1039.101.

(5855) "Total maximum power" means the sum of maximum power for all of a fleet's engines that are subject to this regulation. Low-use vehicles, dedicated snow-removal vehicles, and vehicles used solely for emergency operations need not be included in the sum.

(5956) "Verified Diesel Emission Control Strategy" (VDECS) means an emissions control strategy, designed primarily for the reduction of diesel PM emissions, which has been verified pursuant to the *Verification Procedures*. VDECS can be verified to achieve Level 1 diesel PM reductions (25 percent), Level 2 diesel PM reductions (50 percent), or Level 3 diesel PM reductions (85 percent). VDECS may also be verified to achieve NOx reductions. See also definition of Highest Level VDECS.

(6057) "VDECS Failure" means the condition of not achieving the emissions reductions to which the VDECS is verified. Such condition could be due to inappropriate installation, damage, or deterioration during use. If a Level 3 VDECS is emitting visible smoke, it should be assumed to have failed.

(6158) "Workover rig" means a mobile self-propelled rig used to perform one or more remedial operations, such as deepening, plugging back, pulling and resetting liners, on a producing oil or gas well to try to restore or increase the well's production.

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(e) Special Provisions/Compliance Extensions

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(6) ***Compliance Extension for Equipment Manufacturer or Installer Delays*** - A fleet owner who has purchased new equipment (including VDECS) or vehicles in order to comply with this regulation, will be excused from immediate compliance if the new equipment or vehicles have not been received due to manufacturing or installer delays as long as all the conditions below are met:

(A) The equipment or vehicle was purchased, or the fleet owner and seller had entered into contractual agreement for the purchase, at least four months prior to the required compliance date, or - for a VDECS purchased to replace a failed or damaged VDECS – the fleet owner and seller had entered into contractual agreement for the purchase within 60 days of the VDECS failure.
(B)Proof of purchase, such as a purchase order or signed contract for the sale, including engine specifications for each applicable piece of equipment, must be maintained by the fleet owner and provided to an agent or employee of ARB upon request.
(C)The new equipment or vehicles are immediately placed into operation upon receipt.
(D) Documentation from the manufacturer or the installer that there is a delay, such that the equipment or vehicle will be received or installed after the compliance date.

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(8) ***VDECS That Impairs Safe Operation of Vehicle*** - A fleet owner may request that the Executive Officer find that a VDECS should not be considered the highest level VDECS available because (A) it cannot be safely installed or operated in a particular vehicle application, or (B) its use would make compliance with federal or state requirements for safety or health, ~~occupational safety and health requirements, mining safety and health requirements,~~ or an ongoing local air district permit condition, such as for use of a diesel oxidation catalyst, impossible. If a VDECS manufacturer states that there is no safe or appropriate method of mounting its VDECS on the requesting party's vehicle, then the VDECS will not be considered safe. The Executive Officer shall accept the official findings of the responsible federal or state agency that compliance with the requirements of this regulation would make compliance with the federal and state safety or health requirements impossible. In the absence of such a declaration by the VDECS manufacturer or official findings of a responsible federal or state agency, the requesting party shall provide other documentation to support its claims. Documentation must include published reports and other findings of federal, state or local government agencies, independent testing laboratories, engine or equipment manufacturers, or other equally reliable sources. The request will only be approved if the requesting party has made a thorough effort to find a safe method for installing and operating the VDECS, including considering the use of mirrors, various locations for VDECS mounting, and use of an actively regenerated VDECS. The Executive Officer shall review the documentation submitted and any other reliable information that he or she wishes to consider and shall make his or her determination based upon the totality of the evidence. Upon finding that a VDECS cannot be installed without violating the safety standards prescribed under federal or state requirements for safety or health~~occupational safety and health requirements, mining safety and health requirements~~, the Executive Officer shall issue a determination that there is no highest level VDECS available. The Executive Officer shall inform the requesting party, in writing, of his or her determination, within 60 days of receipt of the request. Parties may appeal the Executive Officer's determination as described in (A) and (B)

below. During the appeal process described in (A) and (B) below, the requesting party may request the administrative law judge to stay compliance until a final decision is issued. If the stay is granted and the Executive Officer denies the requesting party's request, the requesting party has six months from the date of the Executive Officer's final written decision to bring his or her fleet back into compliance.

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(g) Reporting – Reporting is required for each and every fleet. Large and medium fleets may report separately for different divisions or subsidiaries of a given company or agency.

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(1) Initial reporting – All fleet owners must submit the information in section 2449(g)(1)(A) through (G) to ARB by their initial reporting date. In the initial reporting, fleet owners must report information regarding each vehicle subject to this regulation that was in their fleet on March 1, 2009. Systems or non-diesel fueled vehicles that are used in place of a vehicle that would be subject to this regulation must also be reported. The initial reporting date for large fleets is April 1, 2009. The initial reporting date for medium fleets is June 1, 2009. The initial reporting date for small fleets is August 1, 2009. Reports must include the following information:

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(G) Credit for Early Actions – Fleet owners claiming credit for early action must report information required under sections 2449(g)(1)(B)1. through 449(g)(1)(B)5. and sections 2449(g)(1)(C)1. through 2449(g)(1)(C)6. for each vehicle for which credit is claimed. As appropriate, the following information must also be reported:

1. For each vehicle within the fleet that was repowered with a Tier 1 or newer engine prior to March 1, 2009, the date of repower;
2. For each vehicle within the fleet that was retrofit with the highest level VDECS available at the time of retrofit prior to March 1, 2009, the date of retrofit and whether Carl Moyer Incentive Program funding was used to pay for the retrofit;
3. Fleet owners claiming early credit for retirement or replacement of any ~~Tier 0~~ vehicles per section 2449.1(a)(2)(A)2.a.ii. or 2449.1(a)(2)(A)(2)a.vi. or 2449.2(a)(2)(A)(2)a.v. must report information on each and every vehicle within the fleet between March 1, 2006 and March 1, 2010 ~~2009~~, as required under sections 2449(g)(1)(B)1. through 2449(g)(1)(B)4. and sections 2449(g)(1)(C)1. through 2449(g)(1)(C)6. as well as the date of any purchase and/or retirement between March 1, 2006 and March 1, 2010 ~~2009.~~
4. Fleet owners claiming credit for reduced activity in the fleet per section 2449.1(a)(2)(A)(2)a.iv. or 2449.2(a)(2)(A)2.a.iii. must report to the Executive Officer the total hours of use for each vehicle in the fleet, excepting vehicles claimed for early retirement credit, for the twelve month period January 1, 2007, to December 31, 2007 as well as the

twelve month period March 1, 2009, to February 28, 2010. Fleets that do not have hourly reporting records of each vehicle in the fleet must submit to the Executive Officer copies of information that is verifiable and substantively demonstrates a reduction in fleet activity from July 1, 2007, to March 1, 2010.

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(4) Selling Vehicles – Any person selling a vehicle with an engine subject to this regulation in California must notify ARB within 30 days from the date the vehicle was sold. If the reporting date under section 2449(g)(2) occurs within 30 days of the vehicle being sold, the annual reporting may serve as the notification to ARB that the vehicle was sold.

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(h) Record keeping - Fleet owners must maintain copies of the information reported under section 2449(g), as well as the records described in section 2449(h) below, and provide them to an agent or employee of the ARB within five business days upon request. Records must be kept at a location within the State of California.

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(8) Credit for Reduced Activity – Each fleet owner that claims credit for reduced fleet activity with vehicle specific data per sections 2449.1(a)(2)(A)(2)a.iv. or 2449.2(a)(2)(A)2.a.iii. shall maintain the records setting forth the total hours of use of each vehicle in the fleet for each of the twelve month periods indicated in 2449(g)(1)(G)4. A fleet that submits non-vehicle specific data claiming credit for reduced fleet activity, per sections 2449.1(a)(2)(A)(2)a.v. or 2449.2(a)(2)(A)(2)a.iv., must keep a record of all of the information submitted to ARB to support its claim of reduced fleet activity.

(9) Credit for Early Retirement or Replacement – Each fleet owner that claims credit for the retirement or replacement of vehicles from March 1, 2006, to March 1, 2010, per sections 2449.1(a)(2)(A)2.a.ii. or 2449.1(a)(2)(A)(2)a.vi. or 2449.2(a)(2)(A)(2)a.v shall maintain records substantiating the fleet's claim of previous ownership for those vehicles.

~~(8)~~(10) Record Retention – Each fleet owner shall maintain the records for each vehicle subject to the regulation ~~until it is retired and~~ for the overall fleet as long as the owner has a fleet or March 1, 2030, whichever is earlier. If vehicle ownership is transferred, the seller shall convey the vehicle records including vehicle data per section 2449(g)(1)(B), engine data per section 2449(g)(1)(C), and VDECS data per section 2449(g)(1)(D) to the buyer. If fleet ownership is transferred, the seller shall convey the fleet records including fleet data per sections 2449(g)(1)(A) through (G) to the buyer. ~~**Dealers**~~ **Any person selling a vehicle with an engine subject to this regulation in California** must maintain records of the disclosure of regulation applicability required by Section 2449(j) for three years after the sale.

Note: Authority cited: Sections 39002, 39515, 39516, 39600, 39601, 39602, 39650, 39656, 39658, 39659, 39665, 39667, 39674, 39675, 40000, 41511, 42400, 42400.1, 42400.2, 42400.3.5, 42402, 42402.1, 42402.2, 42402.4, 42403, 43000, 43000.5, 43013, 43016, ~~and~~ 43018, and 43018.2, Health and Safety Code. Reference: Sections 39002, 39515, 39516, 39600, 39601, 39602, 39650, 39656, 39657, 39658, 39659, 39665, 39667, 39674, 39675, 40000, 41511, 42400, 42400.1, 42400.2, 42402.2, 43000, 43000.5, 43013, 43016, ~~and~~ 43018, and 43018.2, Health and Safety Code.

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§ 2449.1 NOx Performance Requirements

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(a) Performance Requirements

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(2) BACT Requirements – Each year, each fleet must determine if it will be able to meet the fleet average requirements for the next March 1 compliance date, and if not, the following BACT requirement must be met. If a fleet does not meet the NOx target rate in section 2449.1(a)(1), it must meet the BACT turnover requirements in section 2449.1(a)(2)(A) below.

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(A) Turnover Requirements for Fleets Not Meeting NOx Target Rate –

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1. **Turnover Rate** – If a fleet does not meet the NOx Target Rate in section 2449.1(a)(1) ~~on a compliance date on or before March 1, 2015~~, it must demonstrate ~~on the applicable compliance date~~ that it has turned over ~~8~~ the required percent of the total maximum power of the fleet that existed on March 1of the previous year since March 1 of the previous year. Any carryover turnover credit previously accrued may be applied towards the turnover required in a later year. The required turnover percents to demonstrate on each compliance date are described below in a. through e.

a) 2010: 8 percent.
b) 201 1 and 2012: 4.8 percent.
c) 2013: 14.4 percent for large fleets that did not meet the NOx fleet average target in 2011 or 2012, 11. 2 percent for large fleets that met the NOx fleet average target in 2011 but not 2012, and 8 percent for large fleets that met the NOx fleet average target in 2012 and for all medium fleets.
d) 201 4: 8 percent.
e) 2015 and later: 10 percent.

~~If a fleet does not meet the NOx Target Rate in section 2449.1(a)(1) on a compliance date after March 1, 2015, it must demonstrate on the applicable compliance date that it turned over 10 percent of its total maximum power that existed on March 1 of the previous year since March 1 of the previous year.~~

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2. Carryover turnover credit –

a. Beginning - All fleets ~~other than those meeting the criteria in (i) or (ii) or (iii) below~~ begin with zero carryover turnover credit on March 1, 2009. All fleets may begin accumulating carryover turnover credit on March 1, ~~2010~~2009. To claim credit, fleets must submit to ARB and retain records as described in sections 2449(g) and (h).

i. Credit for Early Repowers - Fleets that have repowered their vehicles with Tier 1 or higher engines before March 1, 2009 ~~begin with~~ will accumulate a carryover turnover credit (in horsepower) equal to: the maximum power of Tier 1 or higher repower engines installed in affected vehicles before March 1, 2009. The credit can only be claimed for engines that remain in the fleet in the year that the credit is taken. ~~To claim credit, fleets must keep adequate records as described in section 2449(h).~~

ii. Credit for Early Replacement ~~Retirement~~ – Fleets that have replaced ~~retired~~ their Tier 0 vehicles at an average rate greater than 8 percent of total maximum power per year between March 1, 2006 and March 1, 2009 ~~begin with~~will accumulate carryover turnover credit (in horsepower) equal to: [(Total maximum power of Tier 0 vehicles retired between March 1, 2006 and March 1, 2009) minus (Total maximum power of Tier 0 vehicles added between March 1, 2006 and March 1, 2009) minus (Total credit for early retirement claimed under section (vi) below)] minus [(Total maximum power of fleet on March 1, 2007 times 0.08) plus (Total maximum power of fleet on March 1, 2008 times 0.08) plus (Total maximum power of fleet on March 1, 2009 times 0.08)]. Tier 0 vehicles repowered with newer engines are counted under (i) above and shall not be counted under (ii). ~~To claim such credit, fleets must keep adequate records as described in section 2449(h).~~

iii. Double Credit for Early NOx Retrofits – Fleets that have installed VDECS that have been verified as achieving NOx reductions on their vehicles before March 1, 2011~~09~~ ~~begin with~~ will accumulate a carryover turnover credit (in horsepower) equal to: 2 multiplied by (Verified Percent NOx Reduction divided by 60 percent) multiplied by (Maximum power on which VDECS verified to achieve NOx reductions was installed before March 1, 2011~~09~~).

iv. Credit for Reduced Fleet Activity– Fleets that demonstrate a reduction in fleet activity will accumulate carryover turnover credit (in horsepower). Fleet activity is defined as the sum of [(Total maximum power of the vehicle) times (Number of hours the vehicle was operated in the applicable 12 month period)] for each vehicle in the fleet.

1. Carryover turnover credit generated from reduced activity may only be applied toward the March 1, 2010, or March 1, 2011 compliance dates.

2. Fleets that receive credit for the retirement of any vehicle prior to March 1, 2010, per section (v) below, can not count that vehicle in the calculation of reduced activity credit.

3. Carryover turnover credit shall be calculated for the fleet, not including those vehicles retired for credit under section (v) below, as:

   [(Fleet activity for January 1, 2007, to December 31, 2007) minus (Fleet activity for March 1, 2009, to February 28, 2010, including vehicles added to the fleet) divided by (fleet activity for January 1, 2007, to December 31, 2007)] multiplied by (Total maximum power of fleet on July 1, 2007)

4. Fleet owners must use vehicle specific data, including but not limited to hour meter logs or operator logs linking operators to specific vehicles, from July 1, 2007, to March 1, 2010, as described in section 2449(g)(1)(G)4 to document vehicle activity.

5. Fleets that do not have hour meter logs or vehicle-specific operator logs or equivalent records that are verifiable and substantively demonstrate activity for all vehicles in the fleet:
   A. May use other verifiable indicators that are directly related to reduced vehicle operation to demonstrate an overall reduction in fleet activity from July 1, 2007, to March 1, 2010, including but not limited to records of overall off-road diesel fuel use for the fleet, as described in section 2449(g)(1)(G)4. However, such fleets must subtract the total credit for early retirement claimed under section (v) below from their reduced activity credit.

   B. May use indicators, including but not limited to revenue or total vehicle operator employment, that demonstrate a reduction in business or staffing but that do not directly correspond to vehicle or fleet activity. To qualify for a credit using such indirectly-correlated indicators, the fleet must be able to provide some evidence of overall reduced fleet activity. The Executive Officer will grant a fleet using such indicators a maximum 20 percent credit for demonstrated reduced activity not directly related to vehicular operation. Such fleets must also subtract from the 20 percent reduced activity credit any credits received for early retirement claimed under section (v) below credit. Fleets must not apply for credit using indicators that would demonstrate reduced business or staffing if the fleet has information or records

that demonstrate the fleet has not reduced overall vehicle activity.

v. Credit for Early Retirement – Fleets that reduce overall horsepower from March 1, 2006, to March 1, 2010, accumulate carryover turnover credit (in horsepower) equal to: (Total maximum horsepower of the fleet on March 1, 2006) minus (Total maximum horsepower of the fleet on March 1, 2010).

b. Accumulating carryover turnover credit –

i. 2010-2015 - From March 1, 2010 through March 1, 2015 for large fleets and from March 1, 2013 through March 1, 2015 for medium fleets, a fleet accumulates carryover turnover credit each year it turns over more than the required~~8~~ percent of its maximum power specified in section 2449.1(a)(2)(A)1. The amount accumulated is the maximum power turned over in excess of the required~~8~~ percent in the 12 months prior to March 1 of the year in which the carryover is calculated. From March 1, 2010, through March 1, 2012, a medium fleet accumulates carryover turnover credit each year the total horsepower it turns over exceeds 8 percent of its maximum power.

ii. After 2015 - After March 1, 2015, a fleet will accumulates carryover turnover credit each year it turns over more than 10 percent of its maximum power. The amount accumulated is the maximum power turned over ~~in excess of 10 percent~~ in the 12 months prior to March 1 of the year in which the carryover is calculated plus the carryover turnover credit used minus the required 10 percent.

iii. Repower Credit– From March 1, 2010 through March 1, 2012, a medium fleet that did not accumulate any credit under (i) above shall accumulate carryover turnover credit each year equal to the total maximum power of Tier 2 or higher repower engines installed in affected vehicles in the 12 months prior to March 1 of the year in which the carryover is calculated. From March 1, 2010 through March 1, 2011, a large fleet that did not accumulate any credit under (i) above shall accumulate carryover turnover credit each year equal to the total maximum power of Tier 2 or higher repower engines installed in affected vehicles in the 12 months prior to March 1 of the year in which the carryover is calculated.

c. Using carryover turnover credit - Accumulated carryover turnover credit may be applied to meeting the turnover requirements of section 2449.1(a)(2)(A)1 in a later year. The amount of carryover turnover credit used to meet the turnover requirements in any one year is subtracted from the carryover turnover credit total available in subsequent years. The amount of actual turnover plus the amount of carryover turnover credit used must equal the minimum BACT turnover required by section 2449.1(a)(2)(A)1.

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4. **Exemptions** A vehicle is exempt from the turnover of section 2449.1(a)(2)(A)1. if all vehicles in the fleet that do not qualify for an exemption under this section have been turned over and the vehicle meets one of the following conditions:

a. On the compliance date, the vehicle is less than 10 years old from the date of manufacture;

b. The vehicle meets all of the following specialty vehicle criteria:

i. The fleet has turned over all other vehicles first,

ii. No repower is available for the specialty vehicle, as demonstrated to the Executive Officer,

iii. A used vehicle with a cleaner engine is not available to serve a function and perform the work equivalent to that of the specialty vehicle, as demonstrated to the Executive Officer, and

iv. The specialty vehicle has been retrofit with highest level VDECS,

c. The vehicle has been retrofitted within the last six years with a Level 2 or 3 VDECS that was highest level VDECS at the time of retrofit, or

d. The vehicle has a Tier 4 interim or Tier 4 final engine.

e. The vehicle has the highest level VDECS installed prior to March 1, 2011, except that this exemption may be applied to no more than 15 percent of a fleet's total horsepower as of March 1, 2010.

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Note: Authority cited: Sections 39002, 39515, 39516, 39600, 39601, 39602, 43000, 43000.5, 43013, 43016, ~~and~~ 43018, and 43018.2, Health and Safety Code. Reference: Sections 39002, 39515, 39516, 39600, 39601, 39602, 39650, 39656, 39657, 39658, 39659, 39665, 39667, 43000, 43000.5, 43013, 43016, ~~and~~ 43018, and 43018.2, Health and Safety Code.

§ 2449.2 PM Performance Requirements

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(a) Performance Requirements -

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(2) BACT Requirements – Each year, each fleet must determine if it will be able to meet the fleet average requirements for the next March 1 compliance date, and if not, the following BACT requirement must be met. If a fleet does not meet the Diesel PM Target Rate in section 2449.2(a)(1), it must meet the BACT Retrofit Requirements in section 2449.2(a)(2)(A). Fleets that fail to meet both an applicable NOx target rate in section 2449.1(a)(1) and the Diesel PM Target Rates in section 2449.2(a)(1) in a compliance year must first meet the BACT turnover requirements in section 2449.1(a)(2) in that year and then meet the BACT Retrofit Requirements in section 2449.2(a)(2)(A) in that year.

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(A) PM Retrofit Requirements for Fleets Not Meeting Diesel PM Target Rate

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1. PM Retrofit Rate - If a fleet does not meet the Diesel PM Target Rate in section 2449.2(a)(1), it must demonstrate that it has retrofit the ~~20~~ required percent of its total maximum power (not including specialty vehicles retrofitted and exempted from turnover in section 2449.1(a)(2)(A)4.b.) with highest level VDECS since March 1 of the previous year, as described below. Any carryover retrofit credit previously accrued may be applied towards the ~~20 percent~~ retrofits required. If the VDECS is not new (i.e., is being reused), it must have been taken from a vehicle that is no longer operating in California. Fleets may count acquisitiont of vehicles with Tier 4 interim or Tier 4 final engines or retirement of Tier 0 vehicles toward the retrofit requirement as described below. The required retrofit percents to demonstrate on each compliance date are described below in a. through d.

a. 2010: 20 percent.
b. 2011 and 2012: 12 percent.
c. 2013: 36 percent for large fleets that did not meet the PM fleet average target in 2011 or 2012, 28 percent for large fleets that met the PM fleet average target in 2011 but not 2012, and 20 percent for large fleets that met the PM fleet average target in 2012 and for all medium fleets.
d. 2014: 20 percent.

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2. Carryover PM retrofit credit –

a. Beginning - All fleets ~~other than those meeting the criteria in (i) or (ii) below~~ for vehicles remaining in their fleets begin with zero carryover retrofit credit on March 1, 2009. All fleets may begin accumulating carryover retrofit credit on March 1, 2009.

i. Double Credit for Early PM Retrofits – Fleets that have installed the highest level VDECS on their vehicles before **January 1, 2010** ~~**March 1, 2009** begin with~~ will accumulate a carryover retrofit credit equal to: 2 multiplied by total maximum power of engines on which highest level VDECS was installed before **January 1, 2010** ~~**March 1, 2009**~~, unless the contract for funding the VDECS stipulates single credit for installation of the VDECS.

ii. ~~Single~~ Credit for Other PM Retrofits Before Initial Compliance Date – Small and ~~M~~medium fleets that install highest level VDECS on their vehicles ~~between **January 1, 2010** **March 1, 2009** and February 29~~ before March 1, 2012 will accumulate carryover retrofit credit equal to: 2 multiplied by total maximum power of engines on which highest level VDECS was installed. Small fleets that install highest level VDECS on their vehicles between March 1, 2012~~**January 1, 2010** **March 1, 2009**~~ and February 28, 2014 accumulate carryover retrofit credit equal to total maximum power of engines on which highest level VDECS was installed.

iii. Credit for Reduced Fleet Activity– Fleets that demonstrate a reduction in fleet activity will accumulate carryover retrofit credit (in

horsepower). Fleet activity is defined as the sum of [(Total maximum power of the vehicle) times (Number of hours the vehicle was operated in the applicable 12 month period)] for each vehicle in the fleet.

1. Carryover retrofit credit generated from reduced activity may only be applied toward the March 1, 2010, or March 1, 2011 compliance dates.

2. Fleets that receive credit for the retirement of any vehicle prior to March 1, 2010, per section (iv) below, can not count that vehicle in the calculation of reduced activity credit.

3. Carryover retrofit credit shall be calculated for the fleet, not including those vehicles retired for credit under section (iv) below, as:

   [(Fleet activity for January 1, 2007, to December 31, 2007) minus (Fleet activity for March 1, 2009, to February 28, 2010, including vehicles added to the fleet) divided by (fleet activity for January 1, 2007, to December 31, 2007)] multiplied by (Total maximum power of fleet on July 1, 2007)

4. Fleet owners may use vehicle specific data, including but not limited to hour meter logs or operator logs linking operators to specific vehicles, from July 1, 2007, to March 1, 2010, as described in section 2449(g) to document vehicle activity.

a. Fleets that do not have hour meter logs or vehicle-specific operator logs or equivalent records that are verifiable and substantively demonstrate activity for all vehicles in the fleet:

   A. May use other verifiable indicators that are directly related to reduced vehicle operation to demonstrate an overall reduction in fleet activity from July 1, 2007, to March 1, 2010, including but not limited to records of overall off-road diesel fuel use for the fleet, as described in section 2449(g)(1)(G)4. However, such fleets must subtract the total credit for early retirement claimed under section (iv) below from their reduced activity credit.

   B. May use indicators, including but not limited to revenue or total vehicle operator employment, that demonstrate a reduction in business or staffing but that do not directly correspond to vehicle or fleet activity. To qualify for a credit using such indirectly-correlated indicators, the fleet must be able to provide some evidence of overall reduced fleet activity. The Executive Officer will grant a fleet using such indicators a maximum 20 percent credit for demonstrated

reduced activity not directly related to vehicular operation. Such fleets must also subtract from the 20 percent reduced activity credit any credits received for early retirement claimed under section (iv) below. Fleets must not apply for credit using indicators that would demonstrate reduced business or staffing if the fleet has information or records that demonstrate the fleet has not reduced overall vehicle activity.

iv. Credit for Early Retirement – Fleets that reduce overall horsepower from March 1, 2006, to March 1, 2010, begin with carryover retrofit credit (in horsepower) equal to: (Total maximum horsepower of the fleet on March 1, 2006) minus (Total maximum horsepower of the fleet on March 1, 2010).

b. Accumulating carryover PM retrofit credit - Beginning March 1, 2010 for large fleets, March 1, 2013 for medium fleets, and March 1, 2015 for small fleets, a fleet will accumulates carryover retrofit credit each year the total horsepower it retrofits plus the carryover retrofit credit it uses exceeds ~~more than~~ the required ~~20~~ percent of its maximum power specified in section 2449.2(a)(2)(A)1. The amount accumulated is the maximum power retrofit plus the carryover retrofit credit used minus ~~percent of maximum power retrofit in excess of 20~~ the required percent in the past 12 months prior to March 1. **A large fleet also accumulates carryover retrofit credit on March 1, 2010 if the sum of the double retrofit credit earned from March 1, 2009 to January 1, 2010 plus the single retrofit credit earned from January 1, 2010 to March 1, 2010 exceeds 20 percent of its maximum horsepower. The amount accumulated is the sum of double credit retrofit credit earned from March 1, 2009 to January 1, 2010 plus the single credit earned from January 1, 2010 to March 1, 2010 in excess of 20 percent of fleet's maximum horsepower in the past 12 months.**

c. Using carryover PM retrofit credit - Accumulated carryover retrofit credit may be applied to meeting the retrofit requirements of section 2449.2(a)(2)(A)1. in a later year. The amount of carryover retrofit credit used to meet the retrofit requirements in any one year is subtracted from the carryover retrofit credit total available in subsequent years. The amount of actual retrofit plus the amount of carryover retrofit credit used must equal the minimum BACT retrofit.

*****

Note: Authority cited: Sections 39002, 39515, 39516, 39600, 39601, 39602, 39650, 39656, 39658, 39659, 39665, 39667, 39674, 39675, 40000, 41511, 42400, 42400.1, 42400.2, 42400.3.5, 42402, 42402.1, 42402.2, 42402.4, 42403, 43000, 43000.5, 43013, 43016, ~~and~~ 43018, and 43018.2, Health and Safety Code. Reference: Sections 39002, 39515, 39516, 39600, 39601, 39602, 39650, 39656, 39657, 39658, 39659, 39665,

39667, 39674, 39675, 40000, 41511, 42400, 42400.1, 42400.2, 42402.2, 43000, 43000.5, 43013, 43016, ~~and~~ 43018, and 43018.2, Health and Safety Code.

APPENDIX C: CREDIT EXAMPLES

These examples demonstrate how a fleet would receive credit using the new provisions in the legislatively directed changes as well as provisions in the current regulation, and how those credits could be used to meet the fleet's BACT requirements. Throughout the examples, the colors shown for the different credits below are used to help clarify which credit provisions the example is calculating. For each current provision and proposed provision in the regulation, the table below shows the regulatory citation, the pollutant that the credit for emission reductions is applied to, and what action the credit is given for.

2449.1(a)(2)(A)(2) on pg. 36 of regulation	NOx	Replacing Tier 0 engines from March 1, 2009, to March 1, 2010.
2449.1(a)(2)(A)(2)(a)(ii) on pg. 37 of regulation	NOx	Replacing Tier 0 engines above 8 percent of total hp on average, annually, from March 1, 2006, to March 1, 2009.
AB 8 2X 43018.2(a)(2)(B)	NOx PM	Retirement of **any** off-road diesel vehicles that reduce total hp, between March 1, 2006, and March 1, 2010.
2449.1(a)(2)(A) On pg. 36 of regulation 2449.2(a)(2)(A)1.b on pg. 43 of regulation	NOx PM	In the rare case that this provision provides more credit than the 2006 to 2010 reduced total hp credit above, fleets could instead choose: Retirement of ***Tier 0*** off-road diesel vehicles that reduce total hp, between March 1, 2009, and March 1, 2010.
AB 8 2X 43018.2(a)(2)(B)	NOx PM	Reduced activity in the off-road diesel fleet, defined as the reduction in average annual hours of use between January 1, 2007, to December 31, 2007, and March 1, 2009, to February 28, 2010

The following actions will also still provide credit to fleets, but are not included in the examples as there is little or no interaction between these credits and those proposed by staff to implement the legislatively directed changes. These credits will be applied to fleets in addition to the new credits.

2449.2(a)(2)(A)(2) on pg. 43 of regulation	PM	Installation of PM VDECS.
2449.1(a)(2)(A)(2).iii on pg.37 of regulation	NOx	Installation of VDECS that are verified to reduce NOx emissions.
2449.1(a)(2)(A)(2).i on pg.37 of regulation	NOx	Repowers to Tier 1 or higher, from a lower Tier, prior to March 1, 2009.

Credit Timeline

Each of the following examples demonstrates how the fleet would receive credits and how the fleet could choose the optimal credit option. The examples calculate credit awarded for actions from March 1, 2006, through March 1, 2010. In some cases the fleets will have credits that roll over to 2011 or beyond. For the sake of simplicity, and to focus on the early credit, the examples do not show the requirements for multiple years; however all carryover credits may be kept until they are used in future years, unless it is specifically noted that they expire in a certain year.

Replacements

Note that where the credits say "Tier 0 Replacements" it refers to a replacement of the hp, not the specific vehicle. That is, if the fleet's only actions are retiring a 500 hp Tier 0 scraper, and purchasing a 350 hp off-road crane for an entirely different purpose, the regulation will count this as 350 hp replaced, and 150 hp retired.

1: Fleet with Reduced Activity Only

Fleet on March 1, 2006:
100,000 hp

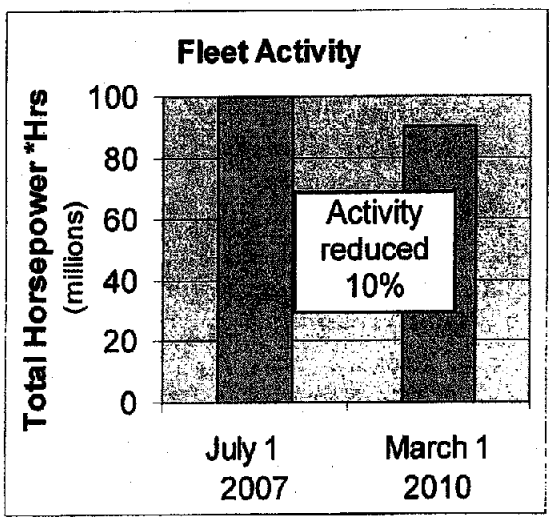
1. **Retirement / Turnover**
   The fleet does not retire or replace any vehicles.

2. **Activity**
   The fleet has reduced activity by 10 percent from July 1, 2007 to March 1, 2010.

   This fleet had 400 vehicles with 100,000 hp total working 1000 hours per year for their July 1, 2007, annual average.

   The fleet has the same 400 vehicles with 100,000 hp total working 900 hours per year for their March 1, 2010, annual average.

   This is a 10 percent reduction in total activity.



3. **Credit Available**

	NOx Credit (hp)	PM Credit (hp)
2009-2010 Replacements	0	n/a
Early Replacements (2006-2009)	0	n/a
Retirement Credit for Shrinking Fleets	0	0
New Reduced Activity Credit (expires in 2011)	10,000	10,000
Total Credit	**10,000 hp** (expires in 2011)[12]	**10,000 hp** (expires in 2011)

[12] Unless noted, the credits in these examples do not expire until they are used to meet the BACT requirements for the fleet.

Determining July 1, 2007 Fleet Activity

Dates	Vehicle hp	Hours Used	Activity (hp*Hrs)
Jan 1, 2007 To Dec 31, 2007	250	900	225,000
	291	1100	320,100
	173	725	125,425
Activity calculated and summed for all remaining vehicles here.			
Sum	**100,000**	**1,000**	100,000,000

Determining March 1, 2010 Fleet Activity

Dates	Vehicle hp	Hours Used	Activity (hp*Hrs)
March 1, 2009 To Feb 28, 2010	250	810	202,500
	291	750	218,250
	173	810	140,130
Activity calculated and summed for all remaining vehicles here.			
Sum	**100,000**	**900**	90,000,000

The fleet's final activity is subtracted from their initial activity, and then divided by the initial activity to determine a percent.

(100,000,000- 90,000,000) / 100,000,000 = 10%

Reduced Activity Credit

The fleet would receive credit for 10% of their July 1, 2007 hp, or
10% x 100,000 hp = **10,000 hp credit to PM and NOx.**

Calculating the BACT Requirements

Pursuant to AB 8 2X, the BACT requirements for 2011, 2012, and 2013, must be changed, but not the 2010 BACT requirements. Fleets that do not meet the fleet average targets in 2010 are required to meet NOx BACT requirements for 8 percent of their total fleet hp and meet PM BACT requirements for 20 percent.

	NOx	PM
March 1, 2009 Fleet Size	100,000 hp	100,000 hp
2010 BACT Requirement	8 %	20 %
BACT hp Requirements	**8,000 hp**	**20,000 hp**

Applying New Credit to the Regulation Requirements

	NOx (hp)	PM (hp)
2010 BACT Requirements	8,000	20,000

Credit Applied	-10,000	-10,000
Requirements After Credit	0	10,000
Credit Rollover	-2,000 (expires in 2011)	0

4. **Result:** The fleet receives enough credit so that it does not have to turn over any vehicles or engine in 2010 for NOx BACT requirements, and receives 2,000 hp credit towards their 2011 compliance requirements for NOx BACT.

   The fleet's retrofit requirements for 2010 are cut from 20,000 hp to 10,000 hp by the reduced activity credit.

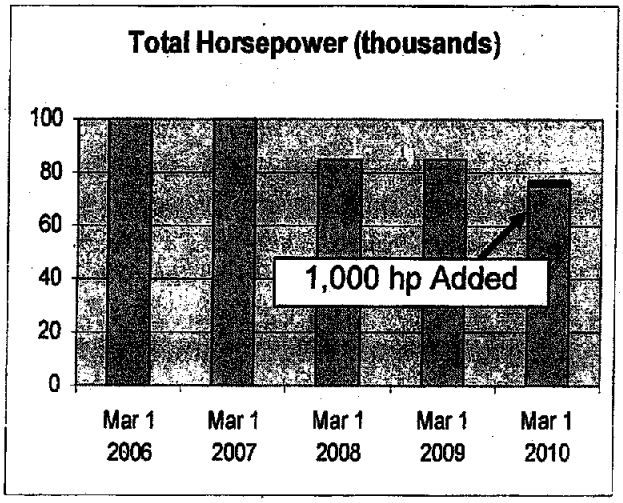
5. **Comparison of credit under current regulation versus proposed amendments**

   Prior to the proposed amendments, there was no credit granted for reduced activity.

	NOx (hp)	PM (hp)
Total Credit Available Before Changes	0	0
Total Credit Available After Legislatively Directed Changes	10,000	10,000

2: Fleet that has replaced Tier 0s and shrunk

Fleet on March 1, 2006:
100,000 hp



1. **Retirement / Turnover**
The fleet retired 15,000 hp of Tier 1, Tier 2, and Tier 3 vehicles in August, 2007. In July, 2009, the fleet retires another 10,000 hp of Tier 0 vehicles, and adds 1,000 hp back in the form of Tier 2 vehicles.

2. **Activity**
The fleet does not reduce activity overall, i.e. the fleet increases activity in their remaining vehicles so that total overall activity remains constant.

3. **Credit Available**

	NOx Credit (hp)	PM Credit (hp)
2009-2010 Tier 0 Replacements	1,000	n/a
Early Tier 0 Replacements (2006-2009)	0	n/a
Retirement Credit for Shrinking Fleets	24,000	24,000
New Reduced Activity Credit (expires in 2011)	0	0
Total	25,000 hp	24,000 hp

Credit for 2009 to 2010 Replacements

The fleet retires 10,000 hp in Tier 0s and adds back 1,000 hp of Tier 2s.
The fleet receives 1,000 hp credit to NOx only for Tier 0 replacements.

Credit under new provision for the retirement of any vehicle which reduces total hp

From March 1, 2006, to March 1, 2010, the fleet

- Retired 25,000 hp Tier 1s, 2s, and 3s
- Shrunk overall by 24,000 hp
  - The fleet receives **24,000 hp, to NOx and PM**

Calculating the BACT Requirements

Fleets that do not meet the fleet average targets are required to meet NOx BACT requirements for 8 percent of their hp and meet PM BACT for 20 percent by March 1, 2010.

	NOx	PM
March 1, 2009 Fleet Size	85,000 hp	85,000 hp
2010 BACT Requirement	8 %	20 %
BACT hp Requirements	**6,800 hp**	**17,000 hp**

Applying New Credit to the Regulation Requirements

	NOx (hp)	PM (hp)
2010 BACT Requirements	6,800	17,000
Credit Applied	-25,000	-24,000
Requirements After Credit	0	0
Credit Rollover	-18,200	-7,000

4. **Result:** The fleet has no requirements in 2010 for NOx or PM.

   The fleet receives 18,200 hp in NOx rollover credit, and 7,000 hp in PM rollover credit that can be applied to the BACT requirements in future years.

5. **Comparison of credit under current regulation versus proposed amendments**

   Currently in the regulation, for a fleet to get credit for Tier 0 retirements prior to March 1, 2009, whether replaced or not, the retirements had to exceed 8 percent of the fleet's hp each year on average, from 2006 to 2009 (i.e., greater than 24 percent total in that three-year period). There is no credit for early retirement of higher tier vehicles. This fleet did not retire any Tier 0s from March 1, 2006 through March 1, 2009 and therefore would have received no early retirement credit.

0 hp *early* credit Available prior to legislatively directed changes

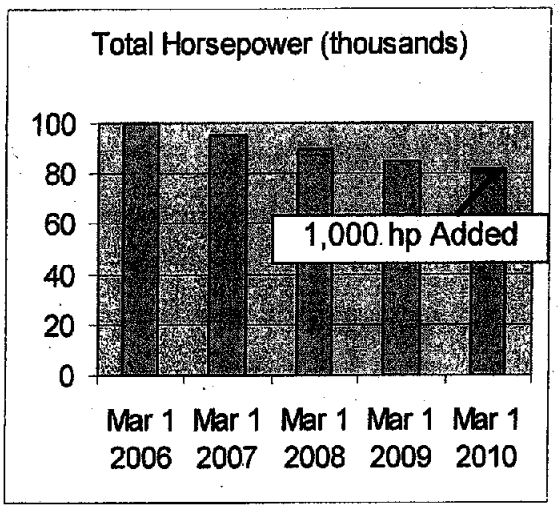
Total Tier 0 Retirements from March 1, 2009 to March 1, 2010: **10,000 hp**
Total Reduction in Fleet size from March 1, 2009, to March 1, 2010: **9,000 hp**

	NOx (hp)	PM (hp)

Total Credit Available Before Changes	10,000	9,000
Total Credit Available After Legislatively Directed Changes	25,000	24,000

3: Fleet that has retired Tier 0s and reduced activity

Fleet on March 1, 2006:
100,000 hp



1. Retirement /Turnover

The fleet retires 5,000 hp of Tier 0 vehicles per year from 2006 to 2010.

The fleet also adds another 1,000 hp of Tier 1s in August, 2009.

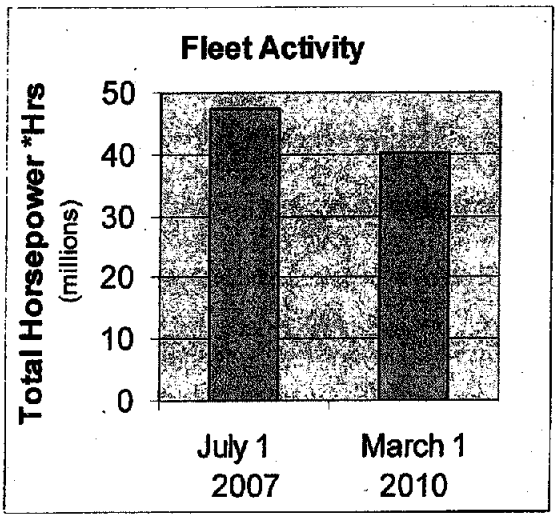
2. Activity

The fleet has reduced activity by 15 percent from July 1, 2007 to March 1, 2010, when comparing

- Total (hp * hours) of the 80,000 hp which was not retired, from January 1, 2007, to December 31, 2007

Vs

- Total (hp * hours) of the entire fleet from March 1, 2009, to February 28, 2010.



3. Credit Available

	NOx Credit (hp)	PM Credit (hp)
2009-2010 Replacements	1,000	n/a
Early Replacements (2006-2009)	0	n/a
Retirement Credit for Shrinking Fleets	19,000	19,000
New Reduced Activity Credit (expires in 2011)	12,150	12,150
Total	32,150 hp	31,150 hp

Credit for 2009 to 2010 Replacements

The fleet retires 5,000 hp in Tier 0s and adds back 1,000 hp of Tier 1s.
The fleet receives **1,000 hp credit towards NOx requirements for Tier 0 replacements**.

Credit for early replacement of Tier 0s

To get credit for early replacement of Tier 0s, the fleet would have had to replace Tier 0s at a rate exceeding 8% of their hp on average from March 1, 2006, to March 1, 2009

Year	Total hp	8% of hp
March 1, 2007	95,000	7.600
March 1, 2008	90,000	7,200
March 1, 2009	85,000	6,800
		21,600

Therefore, to receive credit, the replacement of Tier 0s must exceed: **21,600hp**
Actual Fleet Replacement from March 1, 2006 to March 1, 2009: **15,000 hp**

Credit: 0

Credit under new provision for the retirement of Tier 0s

From March 1, 2006, to March 1, 2010, the fleet

- Retired 20,000 Tier 0s
- Shrunk overall by 19,000 hp
  - The fleet receives **19,000 hp, to NOx and PM**

Credit from Reduced Activity

Determining July 1, 2007 Fleet Activity

Dates	Vehicle hp	Hours Used	Activity (hp*Hrs)
Jan 1, 2007	250	500	125,000
To	291	500	145,500
Dec 31, 2007	173	500	86,500
*Activity calculated and summed for all vehicles **which were not retired by March 1, 2010.***			
Sum			47,500,000

Determining March 1, 2010 Fleet Activity

Dates	Vehicle hp	Hours Used	Activity (hp*Hrs)
March 1, 2009	461	505	232,805
To	237	505	119,685
Feb 28, 2010	245	505	123,725
*Activity calculated and summed for **all vehicles in the fleet at any time from March 1, 2009 to February 28, 2010.***			
Sum			40,375,000

(47,500,000- 40,375,000) / 47,500,000 = 15%

The fleet would receive credit for 15% of their March 1, 2007 hp, or 95,000, minus the 14,000 hp that was retired for credit prior to March 1, 2010 - or 81,000 hp.

15% * 81;000 = 12,150

12,150 hp credit to PM and NOx.

Calculating the BACT Requirements

Fleets that do not meet the fleet average targets are required to meet NOx BACT requirements for 8 percent of their hp and meet PM BACT for 20 percent by March 1, 2010.

	NOx	PM
March 1, 2009 Fleet Size	85,000 hp	85,000 hp
2010 BACT Requirement	8 %	20 %
BACT hp Requirements	**6,800 hp**	**17,000 hp**

Applying New Credit to the Regulation Requirements

	NOx (hp)	PM (hp)
2010 BACT Requirements	6,800	17,000
Credit Applied	-32,150	-31,150
Requirements After Credit	0	0
Credit Rollover	-25,350	-14,150

Note that any remaining credit for reduced activity would expire if not used in 2011.

4. **Result:** The fleet receives 24,600 hp in NOx rollover credit, and 13,400 hp in PM rollover credit that can be applied to the BACT requirements in future years. The fleet receives enough credit so that it does not have to turn over any vehicles or engines in the early years of the regulation. In 2010, the fleet will need to do minimal retrofits to meet the PM BACT requirements.

5. **Comparison of credit under current regulation versus proposed amendments**

To determine how much hp the fleet would have to retire prior to receiving credit, fleets can perform the following calculation.

Year	Total hp	8% of hp
March 1, 2007	95,000	7.600
March 1, 2008	90,000	7,200
March 1, 2009	85,000	6,800
		21,600

Therefore, to receive credit, the retirement of Tier 0s must exceed: **21,600hp**
Actual Fleet Tier 0 retirement from March 1, 2006 to March 1, 2009: **15,000 hp**

0 hp *early* credit available under current regulatory provisions

Total Tier 0 Retirements from March 1, 2009 to March 1, 2010: **5,000 hp**
Total Reduction in Fleet size from March 1, 2009, to March 1, 2010: **4,000 hp**

	NOx (hp)	PM (hp)
Total Credit Available Before Changes	5,000	4,000
Total Credit Available After Legislatively Directed Changes	32,150 hp	31,150 hp

APPENDIX D: LIST OF ACRONYMS

ARB --- Air Resources Board

ATCM --- Air Toxic Control Measures

BACT --- Best Available Control Technology

CAA --- Federal Clean Air Act

CCR --- California Code of Regulations

DOORS --- Diesel Off-Road On-Line Reporting System

EIN --- Equipment Identification Number

HP --- Horsepower

HP-Hours ---Horsepower Hours

HEALTH & SAF. CODE --- California Health and Safety Code

NAAQS --- National Ambient Air Quality Standards

NO_X --- Oxides of Nitrogen

OAL --- Office of Administrative Law

ORIAG --- Off-Road Implementation Advisory Group

PM --- Particulate Matter

PM2.5 --- Fine Particulate Matter

SIP --- State Implementation Plan

TAC --- Toxic Air Contaminants

TPD --- Tons Per Day

U.S. EPA --- United States Environmental Protection Agency

VDECS --- Verified Diesel Emission Control System

CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC MEETING TO CONSIDER A STATUS REPORT ON THE ZERO-EMISSION BUS REGULATION

The Air Resources Board (ARB or Board) will conduct a public meeting at the time and place noted below to consider an informational update on the implementation of the Zero-Emission Bus (ZBus) regulation purchase requirement.

DATE: July 23, 2009

TIME: 9:00 a.m.

PLACE: County Administration Center
1600 Pacific Highway
Board Chambers Room 310
San Diego, California 92101

This item will be considered at a one-day meeting of the Board, which will commence at 9:00 a.m., July 23, 2009. Please consult the agenda for the meeting, which will be available at least 10 days before, to determine the approximate time for which this item will be considered.

If you require special accommodations or language needs, please contact the Clerk of the Board at (916) 322-5594 or by Fax at (916) 322-3928 as soon as possible, but no later than 10 business days before the scheduled Board hearing. TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

As directed in 2006, the staff will present the Board with a review of the technologies and the feasibility of implementing the ZBus purchase requirement that is part of the transit agency fleet regulations. The original ZBus purchase requirement was adopted into regulation in 2000 and the Board has since modified the requirement two times. The most recent modifications in 2006 included an advanced demonstration requirement for diesel path transit agencies and an extension of the ZBus purchase requirement until 2026.

The current regulation includes a purchase requirement for large transit agencies (those with more than 200 buses). For transit agencies on the diesel fuel path, a minimum of 15 percent of purchases and leases, when aggregated annually, for 2011 through 2026 model-year urban buses must be ZBuses. For transit agencies on the alternative fuel path, the 15 percent ZBus purchase requirement starts with model year 2012 and runs through model year 2026. A transit agency introducing a ZBus earlier than required will earn credits that may be used in meeting the overall purchase requirement.

Staff's review of the technologies and the feasibility of implementing the ZBus purchase requirement is intended to provide the Board with an opportunity to reassess and decide whether to proceed with, or to adjust, the current purchase requirement.

In 2006, when the Board directed staff's review, the Board recommended staff's consideration of the following implementation criteria:

Table 1: Implementation Criteria

	Implementation Criteria
Purchase Cost Fuel Cell vs. Electric Trolley Bus	1.25 : 1
Fuel Cell Durability or Warranty	20,000 hours
Reliability (Miles between Propulsion Related Road Calls)	10,000 miles

Technology Status: To date, two ZBus demonstrations have been initiated by large transit agencies and one optional ZBus demonstration is underway by a non-regulated transit agency. Of the three demonstrations, one is complete while the other two are ongoing. Operation results from the demonstrations show improved fuel efficiency but reduced availability and reliability when compared to a similar diesel bus. An advanced demonstration of 12 ZBuses has been initiated by a joint partnership of five Bay Area transit agencies and is scheduled to begin mid 2010. Delays in securing funds and in bus production have caused the demonstration timeline to slip by approximately 18 months from what had been planned. Staff had hoped to have operational data from the Bay Area's advanced demonstration for this report; however, those data will not be available until at least December 2011.

In addition to the above efforts in California, a battery dominant ZBus will be deployed by the City of Burbank in the fall of this year. ZBus demonstrations are also scheduled for South Carolina and Connecticut here in the U.S. and current demonstrations are taking place in Brazil, China, Hamburg, Amsterdam, and Brussels with planned demonstrations coming to London and Vancouver.

ZBus technology remains expensive. A fuel cell bus costs approximately $2.2 million which is 1.8 times the cost of am electric trolley bus and nearly six times the cost of a diesel transit bus. In addition, results from the first ZBus demonstrations showed the average fuel cell durability to be 3,000 hours and the average reliability to be 1,100 miles between road calls. In comparison to the implementation criteria as identified in Table 1, these early demonstrations indicate that ZBus technology is still developing.

Proposed Next Steps: Based on the delay in implementing the advanced demonstration and given the continued high cost of ZBus technologies, staff is recommending a delay in the ZBus purchase requirement. Staff recommends establishing implementation criteria within the regulation, similar to the criteria identified in Table 1, specifying key technology attainment goals that must be achieved prior to implementing a mandatory purchase requirement. Furthermore, staff also recommends that once implemented, the purchase requirement be aligned for all large transit

agencies regardless of fuel path. Finally, staff recommends that the purchase requirement be gradually phased in, allowing for a ramp-up period that will ultimately reach the current 15 percent purchase requirement.

Staff will also discuss a longer term concept that broadens the requirements to reduce transit green house gas emissions while incentivizing innovation and increased transit ridership.

ARB staff will make an oral presentation at the meeting. Copies of the presentation may be obtained from ARB's website at http://www.arb.ca.gov/msprog/bus/zeb/zeb.htm.

Interested members of the public may also present comments orally or in writing at the meeting, and in writing or by email before the meeting. To be considered by the Board, written comments submissions not physically submitted at the meeting must be received **no later than 12:00 noon, July 22, 2009,** and addressed to the following:

Postal mail: Clerk of the Board, Air Resources Board
1001 I Street, Sacramento, California 95814

Electronic submittal: http://www.arb.ca.gov/lispub/comm/bclist.php

Please note that under the California Public Records Act (Government Code section 6250 et seq.), your written and oral comments, attachments, and associated contact information (e.g., your address, phone, email, etc.) become part of the public record and can be released to the public upon request. Additionally, this information may become available via Google, Yahoo, and any other search engines.

The Board requests, but does not require 20 copies of any written submission. Also, ARB requests that written and email statements be filed at least 10 days prior to the meeting so that ARB staff and Board members have time to fully consider each comment. Further inquiries regarding this matter should be directed to Mr. Craig Duehring, Air Resources Engineer, at (916) 323-2361, or to Mr. Gerhard Achtelik, Manager, ZEV Infrastructure Section, at (916) 323-8973.

CALIFORNIA AIR RESOURCES BOARD

James N. Goldstene
Executive Officer

Date: July 7, 2009

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website at www.arb.ca.gov.