

Appendix C
San Joaquin Valley Agricultural Equipment Incentive Measure
Excerpts from 2017 Moyer Guidelines

THE CARL MOYER PROGRAM GUIDELINES

2017 Revisions

VOLUME I: PROGRAM OVERVIEW, PROGRAM ADMINISTRATION AND PROJECT CRITERIA



Approved by the Board: APRIL 27, 2017

California Environmental Protection Agency

 **Air Resources Board**

CHAPTER 2: GENERAL CRITERIA

The criteria listed below apply to all Carl Moyer Memorial Air Quality Standards Attainment Program (Moyer Program) projects. In addition to the criteria below, Moyer Program projects must also meet the additional project criteria found in the applicable source category chapter and the Program Administration Chapter. In cases where there is a conflict between the Guidelines and statute, the Moyer Program statutory provisions take precedence over the Guidelines. In cases where the source category requirements conflict with either the criteria listed below or Program Administration requirements, the source category requirements take precedence.

- A.** Covered emission reductions obtained through Moyer Program projects must not be required by any federal, State or local rule or regulation, memorandum of agreement, memorandum of understanding, settlement agreement, mitigation requirement, or other legal mandate.
- B.** If a Moyer Program project contract has not been fully executed prior to the approval date of an air quality management district or air pollution control district (air district) governing board or Air Resources Board (ARB) rule or regulation (or the promulgation date of a federal regulation) the air district must consider the rule or regulation when evaluating a project's eligibility. If a Moyer Program project contract has been fully executed prior to that date, the air district does not need to consider the rule in evaluating whether the project's emission reductions are surplus.
- C.** An air district must consider all applicable rules or regulations when determining eligibility for a project. If an existing contract is amended to increase the total Moyer Program funding of the project, then the air district must reevaluate eligibility and consider all applicable rules or regulations. If the total dollars do not increase, then the air district does not need to reevaluate eligibility.
- D.** A grant applicant subject to an in-use regulation may be eligible to receive funding through the Moyer Program if the applicant has met all compliance requirements of applicable regulations. Documentation of regulatory compliance must be provided by applicants to air districts prior to funding.
- E.** Participating air districts retain the authority to impose additional more stringent requirements in order to address local concerns.
- F.** No project funded by the Moyer Program may be used for credit under any federal or State emission averaging, banking or trading program throughout the contract term. No covered emission reductions generated by the Moyer Program may be used as marketable emission reduction credits, or to offset any emission reduction obligation of any person or entity throughout the contract term (Health and Safety Code (H&SC) § 44281(b)).

- G.** The new engine, vehicle, or equipment must remain in service for the entire contract term, which must extend to the end of the project life. Throughout the contract term, the emission reductions funded by the Moyer Program must not be used to generate credits or compliance extensions and must be excluded when determining regulatory compliance (H&SC § 44281(b)).
- H.** The State Board and the air districts shall take all appropriate and necessary actions to ensure that all covered emission reductions achieved from a Moyer Program project are creditable in the State Implementation Plans (SIP) and are enforceable, surplus, quantifiable and permanent (H&SC § 44286(g)).
- I.** When Moyer funds are used for co-funded projects, the Moyer Program will account for all covered emission reductions for SIP purposes (H&SC § 44287.2(a)(4)).
- J.** ARB will provide protocols for calculating surplus covered emission reductions over the life of representative project types (H&SC § 44283(c)).
- K.** Engines operating under flexibility provided by an enforcement discretion advisory, mail-out or other advisory issued by ARB, an air district, or the United States Environmental Protection Agency (U.S. EPA) are not eligible for funding.
- L.** Projects funded by the Moyer Program must be included when determining the size of the fleet for regulatory compliance.
- M.** Projects selected for funding must meet cost-effectiveness limits per weighted ton of oxides of nitrogen (NOx), reactive organic gases, and particulate matter reduced, as calculated in accordance with Appendix C, except in the case of infrastructure projects.
- N.** Moyer funds, all local air district AB 923 funds, and match funds must be included in the project cost-effectiveness calculation and are subject to cost-effectiveness limits (H&SC § 44283(d)). Funds from sources other than those listed here are not required to be included in the project cost-effectiveness calculation (H&SC § 44287.2(a)).
- O.** Applicants must report to air districts all private or public financial incentives applied for or used to co-fund Moyer projects (H&SC § 44283(g)). The air district must ensure that the sum of the other incentive funds and the Moyer funds does not exceed the total project cost (H&SC § 44287.2(b)). Appendix C contains an example of the calculation methodology.
- P.** Projects co-funded with Moyer and other public funds must meet all requirements of the contributing programs. Grantees from non-public entities must provide at least 15 percent of the Moyer eligible cost from non-public sources.

- Q.** Moyer Program grants can be no greater than a project's incremental cost. Incremental cost is defined in Appendix B, and some source category chapters provide additional guidance.
- R.** Moyer Program funds cannot be used to pay for energy or fuel costs. However, local funds under an air district's budget authority or fiduciary control (i.e., match or other local funds) may be used to fund energy or fuel costs other than standard gasoline or diesel fuel, when those costs are integral to a project receiving grant funding under the Moyer Program (H&SC § 44283(f)).
- S.** Projects must have at least 75 percent of their total activity for the project life in California, unless otherwise stated in the source category chapters. Activity outside of California is excluded from the covered emission reductions used to determine grant funding and SIP emissions benefits.
- T.** Project engines and retrofits must use only the fuel allowed by the engine certification or retrofit device verification during the project life. Fuel additives are prohibited unless specifically allowed in the engine certification or retrofit device verification.
- U.** Emission reduction technologies must be certified or verified by ARB. If an ARB certification or verification process does not exist or if engines or retrofits are preempted from ARB certification/verification, then an engine or retrofit must be certified/verified to Federal standards as applicable. For the purposes of the Moyer Program, a technology granted a conditional certification/verification by ARB is considered certified/verified. An ARB certification process may not exist for some zero-emission technologies. See the relevant source category chapter for specific requirements for zero-emission technologies.
- V.** In circumstances where an eligible vehicle or piece of equipment has more than one engine, the air district may choose to base the cost-effectiveness calculation on overall vehicle/equipment emission reductions rather than on a per engine basis. The project must meet the current project cost-effectiveness limit.
- W.** Prior to destruction, an engine that is required to be dismantled may be used as a test engine for purposes of retrofit or fuel verification. This can occur as long as the engine complies with the requirements of the guidelines, and the old engine must be destroyed before a payment to the grantee is issued for the new engine.
- X.** Funding is not available for projects where a spark-ignition engine (i.e., natural gas, gasoline, etc.) is replaced with a diesel engine.
- Y.** For repower and replacement projects the replacement engine must achieve an annual NOx emissions benefit of at least 15 percent to receive any funding for NOx reductions.

- Z.** For a repower project, the installation of the engine must be completed in a manner that does not void the engine warranty provided by the manufacturer or any remaining warranty provided by the equipment/vehicle manufacturer.
- AA.** No public monies are allowed for the support of any sectarian or denominational school, or any school not under the exclusive control of the officers of the public schools. (Cal. Const. Art. 16 § 5 and Art. 9 § 8).
- BB.** The revised cost-effectiveness limit and capital recovery factors may be used by air districts once the Board adopts the updated Moyer Program Guidelines, but must be used by July 1 following its adoption. ARB will update the cost-effectiveness limit and capital recovery factors annually through a Mail-Out.
- CC.** ARB may approve, on a case-by-case basis, projects that vary from the requirements of these Guidelines or that do not meet all eligibility criteria in the Guidelines. Projects with case-by-case approvals must provide permanent, surplus, quantifiable, enforceable, cost-effective emission reduction benefits in California for the full contract term. Additional information regarding approval of case-by-case projects is found in the Program Administration chapter.

CHAPTER 3: PROGRAM ADMINISTRATION

TABLE OF CONTENTS

A. Background.....	3-1
B. Grant Fund Allocation and Solicitation.....	3-1
C. Air District Applications for Grant Funds.....	3-2
D. Grant Application Review and Grant Award.....	3-4
E. Fund Disbursement	3-5
F. Redirection of Funds.....	3-6
G. Rural Assistance Program.....	3-7
H. AB 923 - \$2 Motor Vehicle Fee.....	3-9
I. Air District Match Funds.....	3-10
J. Air District Administration Funds.....	3-11
K. Accounting Principles.....	3-12
L. Co-funding Moyer Program Projects with Other Funding Sources.....	3-14
M. Yearly Report.....	3-16
N. Progress Tracking.....	3-18
O. Funding Year Liquidation.....	3-19
P. Return and Reallocation of Funds.....	3-20
Q. Program Nonperformance.....	3-20
R. Incentive Program Review.....	3-22
S. Requirements for Project Applications.....	3-23
T. Application Evaluation and Project Selection.....	3-25
U. Case-by-Case Determination Process.....	3-26
V. Minimum Contract Requirements.....	3-27

W. Project Pre-Inspection.....	3-31
X. Project Post-Inspection.....	3-33
Y. Project Invoice and Payment.....	3-35
Z. Grantee Annual Reporting.....	3-37
AA. Air District Audit of Projects.....	3-37
BB. Nonperforming Projects.....	3-38

CHAPTER 3: PROGRAM ADMINISTRATION

This chapter describes the administrative requirements that the Air Resources Board (ARB), air quality management districts or air pollution control districts (air districts), and interested parties must follow to ensure that Carl Moyer Memorial Air Quality Standards Attainment Program (Moyer Program) projects achieve State Implementation Plan (SIP)-creditable emission reductions.

A. Background

An air district may choose to require more stringent administrative procedures in implementing its local program. Some source category chapters of the Moyer Program Guidelines (Guidelines) give additional administrative requirements. In a case where the source category requirements conflict with requirements specified in this chapter, the source category requirements take precedence.

These Guidelines must be used for all projects funded with fiscal year 2017-18 (Moyer Program Year 20) and subsequent years' funds. The 2017 Guidelines may be utilized for previous year funds after the Board approval date, and applied to projects for which contracts are fully executed after the Board approval date. When an air district begins applying the 2017 Guidelines to projects, it must continue to apply only the 2017 Guidelines to all subsequently funded projects. ARB will follow these 2017 Guidelines for administration of the Moyer Program following Board approval.

For projects funded using fiscal year 2016-17 (Year 19) and previously awarded funds, an air district may use either the 2011 Guidelines or these 2017 Guidelines, with any applicable program advisories and mail-outs. An air district may not apply elements of both Guidelines to a project.

B. Grant Fund Allocation and Solicitation

- 1. Grant Funds Notification.** During each fiscal year, ARB will send a solicitation letter to each air district's Air Pollution Control Officer (APCO) with notification that Moyer Program funds for that year are available. Enclosures with the letter will include the application for funds, a tentative allocation of regular program funds (not including State Reserve funds) for all air districts showing a breakdown of project and administrative funds, and any associated match funds requirement.
- 2. Tentative and Final Funds Allocation.** After a review of projected revenues for the current fiscal year, a tentative funds allocation for all air districts will be determined by ARB under the requirements of Health and Safety Code (H&SC) section 44299.2(a); it may include funds returned or reverted to ARB under section 44287(j). Following receipt and review of air district applications, ARB will determine a final funds allocation that (a) considers any update in projected revenues and (b) redistributes any funds declined by air districts to other air districts that have requested additional funds. This redistribution will also follow

the allocation requirements of Health and Safety Code section 44299.2(a). The typical timeline for the initial allocation, air district application, final allocation, disbursement and subsequent expenditure of a fiscal year's grant funds is provided in Table 3-1.

**Table 3-1
Moyer Program Regular Funds Timeline**

Date	Action
By end of January	ARB sends application packet to air districts
By end of March	Air districts apply to ARB for funds
By end of April	ARB notifies air districts of final awards
By end of May	Air districts return signed grant agreements
June 30 of Following Year	Target date for contracts to be executed
June 30 of Second Year	Deadline for air districts to receive fund disbursements.
June 30 of Fourth Year	Deadline for air districts to liquidate funds

3. **State Reserve Funds.** ARB may direct up to ten percent of Moyer Program funds available each fiscal year to eligible projects selected in accordance with Health and Safety Code section 44286(d). ARB shall annually post on its website a solicitation packet for State Reserve projects. The solicitation packet will include the application requirements and due date, project eligibility criteria, and project selection criteria.

C. Air District Applications for Grant Funds

1. **Air District Options.** An air district may consider the following options upon receiving the solicitation:
 - (A) Accept the tentative allocation in full without change, and commit to the associated match funds amount;
 - (B) Accept the tentative allocation but request additional funds, and commit to the associated match funds amount;
 - (C) Accept the minimum allocation of \$200,000, with no match requirement;
 - (D) Accept the minimum allocation and authorize the funds be designated to the Rural Assistance Program, for the current year and up to four additional years unless rescinded in a future year;
 - (E) Accept the tentative allocation and authorize the funds be designated to a lead air district for Moyer Program funding in the region, for the current year and up to four additional years unless rescinded in a future year;
 - (F) Decline an allocation. In this case the air district's share of funds will be redistributed with the final funds allocation.

- 2. Application and Resolution.** Within 60 calendar days of the date of the solicitation letter, an air district accepting or designating funds will provide ARB a completed application indicating the option chosen above and signed by the APCO. The application will include a board resolution or minute order that supports the option chosen, and will indicate the district is maintaining a Moyer Program Policies and Procedures manual that meet the requirements of this section. For air districts accepting funds the resolution or minute order will commit the district to participate in the Moyer Program, comply with Program requirements, and commit to providing matching funds if requesting funds above the minimum allocation. If the air district board is unable to consider the Moyer Program application within the 60 days following the solicitation letter, the application will indicate when a resolution or minute order will be considered by the board.
- 3. Match Funds.** An air district requesting the tentative allocation or a greater amount must make a match funds commitment equal to 15 percent of State funds requested. The district will indicate on its application the source of match funds. An air district may account for up to 15 percent of its match requirement with in-kind contributions. Sources and requirements for match funds are described in Section I of this chapter.
- 4. Policies and Procedures.** To remain eligible for continued funding, an air district will maintain a Moyer Program Policies and Procedures Manual. The manual will focus on the district's local implementation of the Moyer Program Guidelines, including roles and responsibilities within the district and local application of Moyer Program policies. Air district staff will review the manual at least once a year and make it available when requested by ARB staff or a member of the public. The manual will include at least the following elements:

 - (A) Roles and responsibilities within the air district for program implementation, including staff or positions responsible for: responding to ARB funding solicitations; evaluation, selection and inspection of projects; and obtaining governing board approval for program participation and projects to be funded;
 - (B) Identification of the project source categories supported by the air district Moyer Program, and the schedule for solicitation and review of applications to be submitted under these source categories;
 - (C) Procedures for project selection, including cost-effectiveness or other criteria applied to rank projects, or whether projects are selected in order of application receipt (first-come, first-serve); and any procedures that vary by source category;
 - (D) Procedures for notifying successful applicants of their grant awards, and for notifying applicants who have not been awarded grants;

- (E) Where applicable, project selection procedures that ensure priority for funding projects that will reduce air pollution in communities with the most significant exposure to air pollution (H&SC § 43023.5);
- (F) Where applicable, the procedures for selecting projects to be funded with Moyer Program match funds;
- (G) The method for calculating interest earned on Moyer Program funds held by the air district;
- (H) Procedures for grantees to submit program invoices and receive payment, including itemization required to limit reimbursement to eligible costs, conditions for progress or partial payment, and practices for withheld payments pending grantee reporting;
- (I) Methods the air district will use to verify the destruction of engines and equipment when required, consistent with minimum standards specified in these Guidelines by source category;
- (J) Methods the air district will use to store and retrieve digital photographs documenting project inspections along with associated project-specific information;
- (K) Procedures, schedules and required content for grantee reports;
- (L) The types of acceptable documentation for establishing historical annual usage, and procedures for considering and granting usage waiver requests, including supporting information to be provided by the grantee;
- (M) Procedures for working with nonperforming grantees to gain full compliance with contracts and program requirements;
- (N) Any air district program requirements that are more stringent than those specified in Moyer Program Guidelines and Mail-Outs;
- (O) Any ARB approvals of air district program elements that vary from those required by Moyer Program Guidelines and Mail-Outs, e.g., methods of ensuring engine or equipment destruction that vary from those specified in the source category chapters.

D. Grant Application Review and Grant Award

- 1. Review Period.** ARB will review an application immediately upon receipt and, when necessary, provide the air district with a written explanation of what is missing from the application within ten working days of its receipt. ARB will approve completed applications that fulfill all criteria no later than 60 working days after receipt, including time for ARB review and comment on air district Policies and Procedures if desired (H&SC § 44287(m)).
- 2. Conditional Approval.** ARB may elect to approve an application that is missing a particular item and make the submittal of that item a Special Term and Condition of the Grant Agreement. For example, sometimes air district staff is unable to obtain a board resolution or minute order before the application

deadline. In such a case, ARB may allow a board resolution or minute order to be submitted with the signed Grant Agreement or prior to the air district's initial disbursement.

- 3. Policies and Procedures Review.** The grant application includes the air district's statement that it is maintaining a manual of current policies and procedures consistent with the requirements above. ARB may choose to review an air district's Policies and Procedures Manual, and an air district may request ARB's review of its manual's completeness and consistency with these Guidelines. ARB comments on an air district's Policies and Procedures Manual will be provided by email or in other written format. An air district's policies and procedures as implemented can only be fully evaluated during a program review process.
- 4. Grant Award Notification and Signature.** ARB will prepare and submit to qualifying air districts each year a notification of final grant awards, accompanied by a Grant Agreement for review and signature. A deadline for air district acceptance of the grant award will be specified in a cover letter sent with the Grant Agreement. The Grant Agreement package will include two copies of a cover sheet indicating the amounts of funds granted for projects and for administration, the required amount of match funds if applicable, any Special Terms and Conditions, and General Terms and Conditions for the grant. The district APCO will sign both copies of the cover sheet and return them with original signatures to ARB. Following signature by ARB Budgets Chief, ARB will return one original copy to the air district for its records.

E. Fund Disbursement

- 1. Procedure.** ARB may disburse funds following signature of the Grant Agreement by both parties. To obtain funds the air district will submit a completed current Grant Disbursement Request Form, available on the Moyer Program website. The Grant Disbursement Request Form must include an original signature by a party authorized and designated by the air district's Governing Board. Any Special Terms and Conditions in the Grant Agreement must be met before ARB will disburse funds associated with the grant award. Disbursement requests must be received by ARB by May 15 each year to ensure payment within the fiscal year. Any funds not disbursed by June 30 two years following the award will be reallocated to all districts in the subsequent grant cycle.
- 2. Initial and Additional Disbursements.** An air district may request an initial disbursement of \$200,000 or 10 percent of its project funds, whichever is greater. The air district may request additional disbursements when the criteria below have been met.
 - (A) The preceding Yearly Report demonstrates on-time liquidation consistent with Health and Safety Code section 44287(j); or if not, any funds not

liquidated on time have been received by ARB. ARB will not require a return of funds under executed contract. ARB may require an air district to change the funding years from which funds are assigned to projects in the statewide database (Clean Air Reporting Log or CARL) to facilitate on-time liquidation.

- (B) The Grant Disbursement Request Form is accompanied by a list of projects under executed contract with invoices pending, approved by an air district governing board, or under air district staff review for eligibility and funding. The total cost of the projects listed should equal or exceed the amount of the disbursement request.

- 3. Administration Funds.** An air district may also request some or all of its administrative funds with an initial disbursement. The air district will receive one check for both program administration and project funds, but must account for the expenditure of administration and project funds separately.

F. Redirection of Funds

- 1. Procedure.** An air district may redirect funds to another air district or the Rural Assistance Program by submitting to ARB the items below. For funds already disbursed by ARB and due for liquidation by June 30 of the current fiscal year, the air district must submit these items no later than March 31 to allow time for processing new grant agreements. For funds not yet disbursed by ARB and due for disbursement by June 30 of the current fiscal year, the air district must submit these items no later than March 15 to allow time for processing new grant agreements and subsequent processing of a disbursement request for the air district receiving the redirected funds. A redirection request includes:

- (A) The Moyer Program Redirection of Funds form, with the appropriate portions completed in consultation with ARB staff and indicating the sums of project and administrative funds to be redirected, which may include interest or other earned funds due for liquidation;
- (B) Resolutions or minute orders adopted by the boards of the air districts transferring and receiving funds that authorize the redirection;
- (C) A memorandum of understanding (MOU) or equivalent signed by the air pollution control officers of the affected air districts. The MOU must:
 - (1) Specify the details and conditions of the redirection of funds;
 - (2) Identify which air district is responsible for any required match associated with the redirected funds;
 - (3) Identify the funding year and the associated liquidation deadline for the redirected funds;
 - (4) Specify how and when payment will be made to the air district receiving the funds, including one of the following:

- a. If the transferring air district has not submitted a disbursement request to ARB, the MOU will specify that the air district that is receiving the funds will submit the request to ARB following ARB approval of revised grant agreements.
 - b. If the transferring air district has the funds already, the MOU will specify that it will pay the receiving air district directly, following ARB approval of revised grant agreements.
- 2. Amended Grant Agreements.** After receiving the items above from the transferring air district, ARB staff will develop new or amended grant agreements. District APCOs must sign and return the grant agreement cover sheets for signature by the ARB Budgets Chief. After ARB signature of both revised grant agreements, the receiving air district may request either a disbursement of funds from ARB or payment from the transferring air district. An air district receiving funds from another district will submit a copy of the check to Moyer Program staff.
- 3. Retention of Administrative Funds.** Air districts redirecting project funds but retaining, with approval of the receiving air district, associated administrative funds must provide to ARB by the close of the fiscal year in which the funds were transferred a description of how administrative funds were utilized for the period since the grant award, including but not limited to the following:
 - (A) A summary of air district activities to solicit project applications, including copies of any written grant solicitations and lists of potential applicants to which outreach was directed;
 - (B) A list of project applications submitted and reviewed;
 - (C) A breakdown of staff time devoted to Moyer Program activities;
 - (D) A summary of any Moyer Program training activities for air district staff.

G. Rural Assistance Program

- 1. Purpose.** The Rural Assistance Program (RAP) is a partnership among rural air districts, the California Air Pollution Control Officers Association (CAPCOA), and ARB to enhance rural air district participation in the Moyer Program. RAP facilitates air district participation by streamlining the grant administrative process and by encouraging the pooling of financial and technical resources. The reduction in cost and staff resources lowers the threshold for participation in the Moyer Program and maximizes project funding in rural areas.
- 2. Designation or Redirection to RAP.** An air district may designate funds to RAP in its application for Moyer Program funds (see Section C.1.(D)). An air district may also redirect funds to RAP after it has executed a grant with ARB, but must do so by March 1 of the year by which funds must be disbursed, as shown in the example timeline below. RAP funds that have been disbursed to air districts and

subsequently returned to ARB will be reallocated to other RAP projects whenever possible.

**Table 3-2
Example RAP Funds Calendar:
Moyer Program Year 18 (Fiscal Year 2015-2016)**

January–April 2016	Air district applies for funds and executes Year 18 Grant Agreement; funds are designated to RAP.
March 1, 2018	Deadline to redirect air district’s grant funds to RAP
June 30, 2018	Deadline for air districts to receive fund disbursements. Target date to expend Year 18 grant award.
June 30, 2020	Deadline to liquidate Year 18 grant award

3. Roles and Responsibilities among RAP Program partners are as follows:

- (A) ARB notifies CAPCOA of funds designated or redirected to RAP, and develops and administers grant agreements between ARB and recipient air districts.
- (B) CAPCOA selects a program administrator, which may be CAPCOA staff, an air district, or a third party. CAPCOA also establishes criteria for project selection and approves projects selected by the Program Administrator.
- (C) The RAP Program Administrator provides outreach for RAP, prepares the application and project solicitation, performs initial application screening, ensures project eligibility, ranks projects based on CAPCOA criteria, selects projects, and determines recipient air districts.
- (D) Donor air districts designate all or a portion of their Moyer allocations to RAP on their Moyer grant award application, or redirect grant funds already accepted to RAP using the procedure in Section F of these Guidelines. Air district boards approve designation or redirection of RAP funds via resolution or minute order.
- (E) Recipient air districts sign grant agreements with ARB to accept funds for RAP projects, maintain a Policies and Procedures Manual, and are responsible for grant obligations, including contracts with grantees for project implementation, project inspections, monitoring and reporting. Air district boards approve receipt of RAP funds via resolution or minute order.

H. AB 923 - \$2 Motor Vehicle Fee

1. **Project Eligibility.** State law allows air districts to collect an additional \$2 motor vehicle registration surcharge (MV Fee) (H&SC § 44223) which must be used to fund the following project categories (summarized) (H&SC § 44229(b)):
 - (A) Projects eligible for grants under the Moyer Program.
 - (B) The new purchase, retrofit, repower or add-on equipment for previously unregulated agricultural sources of air pollution (Agricultural Assistance Program, H&SC § 39011.5).
 - (C) Purchase of new school buses or the repower or retrofit of emissions control equipment for existing school buses pursuant to the Lower-Emission School Bus Program adopted by the Board.
 - (D) An accelerated vehicle retirement or repair program that is adopted by ARB.
 - (E) Onboard natural gas tank replacements in existing school buses 14 years or older or the enhancement of deteriorating natural gas fueling dispensers of fueling infrastructure pursuant to the Lower-Emission School Bus Program adopted by the Board.
 - (F) Alternative fuel and electric infrastructure projects solicited and selected through a competitive bid process.
2. **Match.** \$2 MV Fees used to meet the Moyer Program match fund requirement (See Section I) are subject to the same eligibility, reporting, review and auditing requirements as State-provided Moyer Program funds. \$2 MV Fee funds used to meet the match requirement are not required to be expended within two years from the date of their collection. However, air districts must expend sufficient match funds to meet the obligations for the Moyer Program funds received each year.
3. **Reporting and Oversight.** Reporting and oversight of the \$2 MV Fee depends upon whether the fee is used to meet the Moyer Program's match requirement and whether the air district takes SIP credit for \$2 MV Fee projects. Table 3-3 summarizes the various scenarios for treatment of \$2 MV Fee funds and projects. Sections M and R of this chapter further describe \$2 DMV fee reporting and oversight.

**Table 3-3
Summary of \$2 MV Fee Requirements and Oversight**

Requirement	\$2 MV Fee Used as Match	\$2 MV Fee Used for SIP Credit	\$2 MV Fee Not Match/ not SIP
Liquidation of funds within four years	(a)	--	--
Meet full and complete Moyer Program Guideline criteria	√	--	--
Subject to ARB Incentive Program Review	√	--	(b)
Subject to ARB project eligibility evaluation (e.g., cost-effective and surplus)	√	√	√
Fiscal reporting to ARB (list total funds expended in seven basic categories)	√	√	√
Detailed reporting to ARB (project specifics submitted in current database)	√	√	--

(a) Sufficient funds must be liquidated, regardless of their year of origin or source, to provide the required match by that year's liquidation deadline. For example, for Year 18, air districts must complete liquidation of applicable Year 18 match funds by June 30, 2020. When those funds were received is not a factor in determining this deadline.

(b) Non-match projects funded with AB 923 \$2 MV Fee may be evaluated by ARB in conjunction with Incentive Program Review. Evaluation of these projects will be limited to project eligibility. Any irregularities regarding non-match AB 923 \$2 MV Fee project eligibility must be reported separately from Incentive Program Review findings.

I. Air District Match Funds

- 1. Requirement.** Air districts participating in the Moyer Program are required to provide match funding. Air districts implementing the Moyer Program must commit match funds equaling 15 percent of the regular Moyer Program funds received. An air district receiving the minimum grant award of \$200,000 is exempt from this match requirement.

- 2. Federal Funds.** Air districts may use federal funds as Moyer Program match if written confirmation is received from the administering federal agency (for example, the United States Environmental Protection Agency) that (1) the administering agency has no objection to the air district using those funds as match, and (2) the emission benefits obtained from those funds will not be used by the administering agency in a State Implementation Plan. The air district must also ensure that it will not use such funds as match for any other program and that the use of the funds as Moyer Program match does not conflict with any State or local requirements regarding the funds. If this option is used, supporting documentation must be included in all relevant project files.

- 3. Program Basis.** Air districts may meet their matching fund requirement on an overall program basis rather than a project-by-project basis. In other words, air

districts do not need to provide match funds towards each project funded, but must fund enough projects (in total or in part) with match funds in order to meet the match requirement. Match funds are included in cost-effectiveness calculations and subject to the same cost-effectiveness limits as other Moyer program funds.

4. **Match Fund Sources.** Match funds may be any funds under an air district's budget authority or fiduciary control that are committed to be expended in accordance with Moyer program requirements. Match funds may also be provided by a port authority, or a local government teamed with an air district. Match funds provided by a port authority or a local government shall not exceed 30 percent of the total required matching funds in any air district that applies for more than \$300,000 of the state board funds (H&SC § 44287(e)). Port authorities may participate through projects involving their own equipment, or by soliciting port tenants to apply for project funding.
5. **In-Kind Contributions.** Up to 15 percent of an air district's match requirement may be fulfilled through in-kind contributions (H&SC § 44287(h)). Air districts may use any funds under their budget authority, except for Moyer Program administrative funds and interest or other funds earned on Moyer Program funds, to cover their in-kind contributions. When using air district funds for in-kind match, air districts must follow all relevant statute, guidelines, and other legal requirements for expending such funds. In-kind contributions have the same expenditure timeline as match funds. Air district in-kind match funds spent on program administration and outreach must meet the documentation requirements in Section J.
6. **Eligible Projects.** Match funds may be used to pay for any project that meets all Moyer Program criteria. Match funds may also be used to pay for the incremental cost of electricity or alternative fuels serving a Moyer program eligible source category.

J. Air District Administration Funds

1. **Air District Funding.** Air districts with one million or more inhabitants may use up to 6.25 percent of their Moyer Program funds on program outreach and administration, while air districts with under one million inhabitants may use up to 12.5 percent of their Moyer Program funds (H&SC § 44299.1(c)-(d)). Air districts shall maintain an outreach program consistent with Health and Safety Code section 44290.
2. **Allowable Costs.** Table 3-4 lists allowable administration costs and documentation that the air district is required to maintain for Moyer Program administrative funds. Air districts will make available the documentation shown in the table for review during ARB or other State agency monitoring visits, reviews and audits. Such administrative records for a given funding year must be retained for a minimum of five years following the applicable funding year

liquidation deadline. For example, for Year 16 (fiscal year 2013-2014) funds, the funding year liquidation deadline is June 30, 2018, and administrative records would be retained through June 30, 2023.

**Table 3-4
Administration and Outreach Costs and Documentation**

Allowable Cost	Required Documentation
Air district staff time	Personnel documentation that may include timesheets or output of labor tracking software; duty statements or job descriptions indicating percentage of staff time; or written summaries of Moyer Program staff activities with time estimates by activity or task.
Consultant fees	Consultant contracts and invoices
Printing and mailing costs	Receipts and invoices. Copies of solicitations and outreach materials indicating availability of grants
Travel expenses	Receipts and invoices. Travel cost criteria must be consistent with written air district travel policies for other air district programs, cited in the Policies and Procedures Manual or local administrative manual.
Indirect costs	Indirect cost calculation methodologies must be described or cited in the Policies and Procedures Manual or local administrative manual, and calculated costs must be documented.

- 3. Mitigation for Unallowable Costs.** An air district that charges unallowable costs for program administration or outreach must substitute eligible administration and outreach expenses equal to the dollar amount found ineligible, or return the funds for the unallowable cost to ARB.

K. Accounting Principles

Air districts must establish accounting practices for Moyer Program funds consistent with the requirements below, as early as practicable and no later than July 1, 2019.

- 1. Moyer Funds Account.** Moyer Program funds (Moyer funds) must be accounted for as separate funds within the air district’s general ledger following generally accepted accounting principles (GAAP). An air district receiving a total allocation of one percent or more of all Fiscal Year 2016-17 Moyer Program funds must use a Special Revenue Fund for Moyer funds accounting. Other air districts may use a Trust Fund.
- 2. Timing of Recognition in Financial Statements.** Moyer Program grants are voluntary non-exchange transactions to the air district. As such the air district should recognize revenues in the fiscal period when all eligibility requirements have been met and the resources are available. For reference see Governmental Accounting Standards Board (GASB) Statements 33 and 34.

3. Required Financial Statements. Financial statements containing at minimum the following account balances and transaction classes, as applicable, will be prepared at least annually.

(A) Balance Sheet:

- (1) Cash and Cash Equivalents (cash, investment pools, petty cash)
- (2) Moyer Program Fund Revenue Receivable (grant funding from ARB)
- (3) Recapture Revenue Receivable (recapture funds receivable from grant participants for unmet contractual obligations)
- (4) Salvage Revenue Receivable (revenue receivable from retired equipment sold or auctioned for scrap metal)
- (5) Accounts Payable (vendor invoices pending for Moyer projects)
- (6) Fund Balance
 - a. Restricted for Air District Projects
 - b. Restricted for State Reserve, Multi-District, RAP Projects
 - c. Restricted for Administration and Operating Costs

(B) **Statement of Revenues, Expenditures, and Changes in Fund Balance:**

- (1) Revenue Subsidiary Ledgers
 - a. Regular Moyer Funds Project Revenue
 - b. State Reserve and Multi-District Project Revenue
 - c. Rural Assistance Program Project Revenue
 - d. Administration and Operating Revenue
 - e. Recapture Revenue
 - f. Salvage Revenue
 - g. Interest Revenue
- (2) Expenditure Subsidiary Ledgers:
 - a. Project Expenditures (from regular Moyer grant, recapture, salvage, interest)
 - b. State Reserve and Multi-District Project Expenditures
 - c. Rural Assistance Program Project Expenditures
 - d. Administration and Operating Expenditures including indirect costs
- (3) Awards Returned: Moyer Program air district money returned to ARB for reallocation
- (4) Transfers In/Out

4. Interest Revenue. Any interest earned on investment of Moyer fund cash balances must be deposited in the Moyer funds account and used to fund

Moyer-eligible projects, or to fund administration up to the portion provided for in Health and Safety Code section 44299.1(c)-(d), or be remitted to ARB.

- (A) An air district electing not to invest Moyer Program fund cash balances but investing other cash balances should deposit the Moyer Program funds in a separate checking account to clearly indicate that no such moneys were invested.
- (B) When invested, Moyer Program funds should receive equitable pro-rated interest earned on the total funds invested. As State funds, Moyer Program funds may be invested only in accounts or instruments that reflect the risk appetite of the State. For reference see Office of the State Treasurer Local Agency Investment Guidelines. Any loss from investments not made in accordance with standards set forth in California Government Codes must be covered by the air district.

- 5. Recapture and Salvage Revenue.** Revenues earned or collected by the air district through Moyer Program resources, including revenues obtained through salvage and sale of scrapped equipment, must be reported and either retained as a supplemental source of funds for Moyer projects or forwarded to ARB for deposit to the Air Pollution Control Fund. If recaptured funds or salvage revenues are invested, such revenues must meet the requirements of Section K.4.(B) above. Air districts are not required to earn funds through program actions, or expected to base business decisions on their ability to generate returns or collect funds through program activity.
- 6. Expenditures for Moyer Program Projects.** All project expenditures out of the Moyer funds account must meet the Moyer Program Guidelines current at the time of contract execution, including any revisions to those Guidelines in effect at the time of contract execution.
- 7. Reporting Requirements.** No later than six months after the air district fiscal year end, the district will append to its Yearly Report a Balance Sheet and a Statement of Revenues, Expenditures and Changes in Fund Balance, in formats consistent with GAAP.
- 8. Records Retention.** Grant receipts and expenditure documents including invoices, contracts, vouchers, personnel and payroll records should be retained for five years after the grant liquidation period or the last recorded grant transaction, whichever is later.

L. Co-funding Moyer Program Projects with Other Funding Sources

- 1. Purpose.** Senate Bill 513 (Beall, 2015) provides new opportunities to co-fund Moyer Program projects with other funding sources. These Guidelines specify requirements that apply when multiple funding sources are proposed to support a Moyer Program eligible project. All co-funded projects must adhere to the Moyer Program objective to achieve cost-effective and surplus emission reductions to

be credited toward California's legally enforceable obligations in the SIP (H&SC § 44286(g)). There is no limit on the number of co-funding sources to fund a project as long as total project costs are not exceeded and the applicant cost share requirement is met.

- 2. Designation of Non-Moyer Funds:** Funds other than Moyer Program grant funds may be used to co-fund Moyer Program eligible projects, when all program criteria associated with each funding source are met. Funding sources are grouped into the following categories. Definitions of these categories can be found in Appendix B.
 - (A) Federal funds;
 - (B) State funds;
 - (C) Local funds;
 - (D) Penalty funds;
 - (E) Other applied funds.
- 3. Mitigation Funds.** Mitigation funds may be used to co-fund a Moyer project if an air district submits a request for a case-by-case determination in accordance with Section U and receives ARB approval.
- 4. Cost-effectiveness Calculation.** The non-Moyer funds described above are not required to be included in Moyer project cost-effectiveness calculations (H&SC § 44287.2(a)). Match funds and all AB 923 \$2 DMV Fees are required to be included in project cost-effectiveness calculations.
- 5. Applicant Cost Share.** An applicant that is not a public entity must provide at least 15 percent of a project's Moyer eligible cost from non-public sources. The applicant cost share cannot be covered through in-kind contributions. An air district may request a case-by-case determination from ARB to waive all or part of an applicant's cost share, in accordance with Section U. In its waiver request, an air district must identify the source(s) and amount(s) of the proposed project's funding and explain the reasons for the cost share waiver, discussing at a minimum either or both of the following factors:
 - (A) The public benefit of the project that is above and beyond the emission reductions achieved;
 - (B) How the project will advance newer and cleaner technology.
- 6. Applicant Disclosure and Payment.** The sum of project funding from all sources may not exceed the total project cost (H&SC § 44287.2(b)). Applicants must disclose all sources of funding applied for at the time of the Moyer project application, and again when submitting each invoice to the air district, prior to payment of Moyer Program grant funds (H&SC § 44283(g)). An air district may not issue payment of Moyer Program grant funds until all funding sources have

been identified and verified and the air district can ensure that the sum of the grants awarded to the project, including both Moyer and non-Moyer funds, does not exceed the total project cost.

- 7. Emission Reductions.** All covered emission reductions achieved from a project with multiple funding sources will be credited as reductions from the Moyer Program to ensure proper SIP accounting, improve the likelihood of federal credit, and avoid risk of double-counted reductions. Other emission reductions, such as greenhouse gases, may be claimed by other programs that co-fund a project.
- 8. Reporting of Project Data.** For co-funded projects an air district will report in CARL consistent with the reporting requirements of Section M. The air district will also report other co-funding sources and funding amounts. When reporting project funding sources to CARL, air districts will categorize certain co-funding sources as specified below.
 - (A) Funding from investor owned utilities will be reported as “other applied funds,” and funding from publicly owned utilities as “local funds.”
 - (B) Supplemental environmental project funds will be reported as “other applied funds.”
 - (C) Funds from local transit agencies will be reported as “local funds.”

M. Yearly Report

- 1. Reporting Requirement.** Each year by June 30, ARB will prepare and make available to air districts a certification form with instructions for completion of the Yearly Report. Air districts will complete, certify and submit the Yearly Report by August 29. An air district that has designated to another air district or the Rural Assistance Program all grant funds for all years covered in the Yearly Report is not required to complete a report.
- 2. Reporting in CARL.** Air districts will report project information in the Clean Air Reporting Log (CARL) database, either via CARL forms or batch import, sufficient to populate the required data fields and to calculate covered emission reductions and cost-effectiveness for source categories where required. The air district will ensure the information in CARL is complete, correct, and supported by documentation. The air district will report on projects funded in whole or part with these funds:
 - (A) Granted Moyer Program funds;
 - (B) Match funds;
 - (C) Interest and other non-grant revenues earned to support the Moyer Program;
 - (D) Multi-district and State Reserve funds;

- (E) Rural Assistance Program funds;
- (F) Non-Moyer funds as specified in Section L;
- (G) AB 923 \$2 DMV fees used for projects claimed for SIP credit;
- (H) Other funds that ARB oversees relative to the Moyer Program.

3. Report Content. The Yearly Report will include the following information as of June 30, the end of the past fiscal year:

- (A) Output generated by the Required Reports utility of CARL for the default years specified in the utility.
- (B) Contract execution and liquidation status of Moyer Program funds, including match funds, earned interest funds, multi-district and State Reserve funds, RAP funds, and other funds for which the air district has a Moyer Program obligation during the fiscal years covered by the report. Funds will be reported relative to the progress milestones identified in Sections N and O below.
- (C) A funding summary by project type of non-match projects funded with AB 923 \$2 MV fees when no SIP credit is claimed. Projects funded with AB 923 \$2 DMV fee funds not used as match and not claimed for SIP credit need not be entered into CARL, but the air district will summarize in the Yearly Report the amounts of such funds expended for each of the project categories identified in Section H.1.
- (D) For the most recent fiscal year, additional funds available to the Moyer Program from the following sources. These funds will be included in the target for the funding year due for liquidation in four years unless the air district directs ARB staff to include them in an earlier year target.
 - (1) The amount of any interest accrued on Moyer Program funds held in local accounts. An air district may choose to designate in the Yearly Report all or a portion of this interest for remittance to ARB.
 - (2) Funds recaptured from liquidated projects, including funds provided back to the air district following ARB enforcement actions, identified by project name and funding year.
 - (3) Non-grant revenue earned for the Moyer Program by the air district, such as from the sale of scrapped engines or equipment.
- (E) A list of any projects identified as non-performing and a brief narrative of any related enforcement actions.
- (F) The portion of match funds to be met through in-kind contributions, as provided in Section I.5.

4. Report Certification and Documentation. The air district APCO, Chief Financial Officer (CFO), and Moyer Program administrator must sign and certify that the project and fiscal information contained within the Yearly Report is, to the

best of their knowledge, accurate and complete. The APCO may also serve as the Moyer Program Administrator. The APCO may designate an alternate to the CFO if the designated alternate is someone other than the APCO or Program Administrator. The air district will maintain documents in support of the report at the air district office, and make them available to ARB staff upon request.

5. **Project Eligibility.** Receipt of a Yearly Report by ARB does not imply ARB approval of project eligibility. Air district staff is responsible for project approval and funding eligibility determinations. Air districts that are found to have funded ineligible projects will be required to substitute eligible projects equal to the amount found ineligible or return the ineligible amount to ARB.

N. Progress Tracking

1. **Progress Milestones.** To support timely emission reductions and track progress toward statutory fund liquidation requirements, air districts and ARB will work together to meet recommended progress milestones as follows. After execution of a grant agreement with ARB for Moyer Program funds, air districts will make every effort to have 50 percent of the project funds awarded under executed contract by June 30 of the next calendar year, and 100 percent of the project funds under executed contract by June 30 of the second calendar year after the agreement. Air districts will also make every effort to have 50 percent of project funds liquidated within two years, and 75 percent of project funds liquidated within three years. Similar progress milestones apply to any match funds associated with granted project funds. Progress will be reported in Yearly Reports. Table 3-5 shows an example of progress milestones for the 2018 Yearly Report.

**Table 3-5
Example Progress Milestones: 2018 Yearly Report**

Timeline	Fiscal Year	Funding Year	Milestone
1 year	2016-17	19	50% of project funds under executed contract
2 years	2015-16	18	100% of projects funds under executed contract
			50% of project funds liquidated
3 years	2014-15	17	75% of project funds liquidated
4 years	2013-14	16	100% of grant funds liquidated (Section O)

2. **Cumulative Tracking.** ARB will provide tools in CARL to track district progress toward milestones. Except in the case of a four-year funds liquidation deadline, districts may track progress on a cumulative basis. In the table above, for

example, an air district demonstrating the portion of funding year 17 project funds liquidated would count any funds liquidated from funding years 18 to 20.

- 3. Funding Targets.** To assist cumulative tracking and reporting, ARB will maintain in CARL appropriate progress tracking targets for each funding year. These funding targets will include the total funds required to meet contract execution and liquidation progress milestones. ARB will adjust progress tracking targets to account for the movement of funds into and out of an air district's account, including redirected funds, RAP grants, adjustments for in-kind match, and other changes agreed to in consultation with districts.
- 4. Execution Progress for Vouchers.** For Moyer voucher programs, the voucher issue date is used in lieu of executed contract date to gauge progress in contract execution.
- 5. Cancelled Contracts.** Any funds associated with an engine, vehicle, or equipment cancelled from a contract prior to the liquidation of the contract as a whole will no longer be considered executed beginning at the time of the cancellation.
- 6. Follow-up Actions.** Progress milestones are advisory in nature. ARB liaisons and management will work with air districts that do not demonstrate sufficient progress toward contract execution and project liquidation targets in the Yearly Report. When an air district cannot demonstrate at least one-half of funds are under contract after two years, and one-half of funds liquidated after three years, the district will append to the Yearly Report a progress statement. The statement will address the reasons for delays in executing contracts or completing payment for projects, and the schedule for follow-up actions. Such actions may include specific steps to improve progress or the redirection of funds to air districts better equipped to meet statutory liquidation deadlines.

O. Funding Year Liquidation

- 1. Liquidation Requirement.** By June 30 of each year, air districts must have liquidated all Moyer Program funds associated with the funding year four calendar years prior, as well as interest, recaptured funds, and other funds added to the funding target for that year. For example, funds awarded for Year 18 (fiscal year 2015-2016) must be fully liquidated by June 30, 2020. Before submitting the Yearly Report an air district may attempt to resolve an apparent liquidation shortfall by modifying in the CARL database the funding years from which funds are assigned to projects.
- 2. Match Liquidation.** Match funds must be liquidated by the same liquidation deadline as the Moyer Program funds with which they are associated regardless of the date such funds were collected by the air district.
- 3. Liquidation Terms.** Air districts are advised of the distinction between project liquidation used for cumulative progress tracking in Section N and funding year

liquidation as required in this section. Project liquidation is demonstrated when all funded equipment in a project are paid-in-full and post-inspected; liquidated projects are credited in cumulative progress tracking. Funding year liquidation is demonstrated when all funds assigned to a funding year have been paid out in full, with the exception of any withheld payments. Liquidated projects are credited in cumulative progress tracking.

4. **Data Completion.** A funding year that has been liquidated by an air district and all associated projects will be removed from cumulative tracking. Projects associated with liquidated funding years may not be revised in or removed from the CARL database after the funding year is liquidated, except in unusual circumstances following consultation with and written approval by ARB staff.
5. **Withheld Payments.** For completed projects for which all invoices have been paid except for a small amount withheld pending grantee reporting, both the paid funds and the withheld funds will be considered liquidated for the purpose of funding year liquidation. Withheld payment practices must be addressed in the project's contract and in the air district's Policies and Procedures Manual. Withheld progress payments considered to be liquidated per this section that are not ultimately paid to the grantee due to non-performance will be reported as recaptured funds.

P. Return and Reallocation of Funds

1. **Return of Unliquidated Funds.** If the Yearly Report identifies a liquidation shortfall that cannot be resolved through reassignment of liquidated funds from more recent years, and the remaining unliquidated funds are not under executed contract, the air district must submit and ARB must receive a check for the shortfall amount by September 28 (i.e., 90 days after the June 30 liquidation deadline and 30 days after the Yearly Report deadline). ARB will provide Instructions for the return of funds in the Yearly Report certification form. No additional disbursements will be made to the air district until funds subject to return have been received by ARB.
2. **Return of Other Funds.** An air district choosing to remit to ARB all or a portion of earned interest, or to return other funds following consultation with ARB, may do so following instructions in the Yearly Report certification form.
3. **Reallocation.** ARB will add funds returned by air districts to the subsequent cycle of Moyer Program funding, following the allocation requirements of Health and Safety Code section 44299.2.

Q. Program Nonperformance

1. **Monitoring Nonperformance.** As directed by Health and Safety Code section 44291(d), ARB monitors air district programs to ensure that participating air districts conduct their programs consistent with the criteria and guidelines established by the Board. Program non-performance is an air district's

non-compliance with program Guidelines or statute that is not corrected by the air district in a timely or satisfactory fashion. ARB may become aware of possible air district non-performance through Yearly Reports, Incentive Program Review, district self-reporting or other means. Examples of program non-compliance with program guidelines or statute include, but are not limited to, the following:

- (A) Failure to return unliquidated funds within 90 days of the liquidation deadline (H&SC § 44287(j));
- (B) Misuse of Moyer Program funds, including funding of ineligible projects;
- (C) Insufficient or improper program oversight and enforcement, including widespread deficiencies in project contracting, inspections, reviews or audits;
- (D) Insufficient, incomplete, or inaccurate project documentation;
- (E) Failure to submit timely and accurate reports to ARB;
- (F) Other non-compliance with program guidelines or statute.

2. Nonperformance Procedures. When ARB determines that an air district program is not complying with program guidelines, the ARB liaison and manager will work with air district staff to understand the issues, and develop a plan and timeline to resolve them. If the ARB Branch Chief determines that the issues related to program nonperformance have not been resolved, ARB will send by email to the air district program contact a program nonperformance notification, that contains the following:

- (A) Description of the unresolved issues, including pertinent details such as names of involved persons and projects, dates, dollar amounts, and citations of relevant program guidelines sections, Health and Safety Code sections, and regulations; and
- (B) Possible solutions to the problem, if some have been identified, and/or an offer ARB assistance; and
- (C) Arrangements for a possible meeting between the ARB Branch Chief and the air district APCO to agree on a plan and timeline for resolving the problem. The plan and timeline shall be recorded by the ARB air district liaison and emailed to the air district APCO within five business days of the meeting.

3. Withholding of Funds by ARB. Lacking satisfactory resolution of the issues that have resulted in the nonperformance notification, the ARB Executive Officer will determine if the nonperformance warrants withholding funds that have been granted to the air district and not yet awarded to approved projects. If so, ARB will send a letter of program non-performance to the district APCO. The letter will set a public meeting to be held at the air district's offices (or other appropriate

facility within the air district). The purpose of the meeting will be to consider public comments prior to withholding any funds.

R. Incentive Program Review

- 1. Purpose.** ARB conducts Incentive Program Reviews to help ensure that air district programs achieve expected emission reductions and are implemented in a manner consistent with these Guidelines and State law (H&SC § 44291, 39500). ARB Incentive Program Reviews place emphasis on collaboration with the affected air district in the review process. Features of this approach include a joint initial review of project files, ongoing and regular communication with air district staff throughout the file review process, and where possible an opportunity for districts to correct problems prior to their inclusion as findings in the final report.
- 2. Scale of Review.** ARB uses a risk-based approach to select specific air district programs and projects to review, and to select fiscal years within the scope of each review. Air districts are selected for Incentive Program Review based on identified need or with consideration of program funding amount. ARB's objective is to review over a five-year period air district programs receiving at least 80 percent of Moyer Program funds. Air district implementation of other State incentive programs will be selected as appropriate for review at the same time as the Moyer Program review.
- 3. Fiscal Compliance Audits.** ARB may also contract with independent auditors including the California Department of Finance Office of State Audits and Evaluations, to conduct audits of incentive program fiscal compliance. The independent auditors will conduct these audits in accordance with Generally Accepted Government Auditing Standards, and will prepare reports on the results of the audits including any findings. ARB retains final authority with respect to corrective measures and follow-up, in consultation with the air district.
- 4. ARB Responsibilities.** ARB will conduct Incentive Program Reviews in a manner that reflects its entrusted accountability and responsibilities.
 - (A) ARB will generally define the scope of a Moyer Program review to cover a period of up to five fiscal years not covered in the previous review. The scope of years within review may vary for other incentive programs. Once a funding year is reviewed, ARB will not review it again unless warranted. ARB may investigate possible fraud or misuse of funds in any program year.
 - (B) ARB will maintain open channels of communication with the air district during the review. ARB will fully explain the review's scope and procedure at the beginning of the process, discuss preferred channels of communication with the air district, inform the air district of potential issues as they unfold, provide full and ongoing opportunity for air district input, provide the air district opportunities to correct problems that arise during

the review process, thoroughly discuss any findings and recommendations with the air district before and during the exit interview, and provide the air district an opportunity to formally respond to the Incentive Program Review report.

- (C) To ensure objectivity and predictability, ARB will base its findings and recommendations on State law, applicable guidelines and Mail-Outs, grant agreements, email communications between ARB and the air district, the air district's Policies and Procedures Manual, case-by-case determinations, and the air district's local requirements.
- (D) All Incentive Program Review reports, air district responses, and related documents shall be made available to the public via posting on ARB's Moyer Program website.
- (E) ARB will conduct follow-up activities to ensure any deficiencies remaining following review are promptly and effectively mitigated. ARB will offer its assistance to air districts working to correct deficiencies.

5. Air District Responsibilities. Air district staff and management will participate in entrance and exit interviews, support collaborative review and open communication with ARB staff, ensure that program files and other requested information are available to reviewing staff of ARB and the Department of Finance, work to fully and promptly mitigate deficiencies identified during the review, work to resolve any disagreements, and request assistance from ARB as necessary.

6. DMV Fee Project Evaluation. AB 923 \$2 MV Fee projects are subject to Incentive Program Review or evaluation as follows:

- (A) A Moyer Program match project funded with the AB 923 \$2 MV Fees will be subject to the same review and oversight requirements and protocols as other Moyer Program match projects.
- (B) A non-match project funded with the AB 923 \$2 MV Fee may be evaluated by ARB in conjunction with an Incentive Program Review. Evaluation of these projects will be limited to project eligibility. Any irregularities regarding non-match AB 923 \$2 MV Fee project eligibility will be reported separately from other Incentive Program Review findings.

S. Requirements for Project Applications

- 1. Data Required for CARL.** Project applications must include the information needed for calculation of project cost-effectiveness in the CARL database.
- 2. Existing Engine Usage.** Project applications must include documentation of existing engine usage, such as miles traveled, hours operated, or fuel consumed per year, for 24 months or as specified in these guidelines by source category.

This information will be used to evaluate project cost-effectiveness and the maximum grant award amount.

- 3. Active Duty Military Applicants.** If an applicant has been on active military duty at any time during the previous 24 months, documentation prior to deployment and covering the same length of time as the deployment period may be used to meet the title, registration, usage, and operation in California requirements as applicable for each source category. The applicant must submit a copy of DD Form 214, Certificate of Release or Discharge from Active Duty to verify military service during the deployment period.
- 4. Third Party Signature.** Applications must include a signature and date section for third parties. A third party may complete an application or part of an application on an owner's behalf if the vehicle, engine, or equipment owner signs and dates the application.
- 5. Applicant Certification.** Project applications must include language informing the applicant that by signing and submitting the application, the applicant certifies under penalty of perjury that the information in the application is accurate and true. In addition, the application must include the following statements that the applicant or the applicant's designee must certify as accurate and true:
 - (A) A disclosure statement consistent with Section L.6. of this chapter, specifying whether the applicant has submitted an application for incentive funds to any other entity or program for the same equipment (for example, repowering of the same engine). The applicant must disclose to whom other applications were submitted, whether funds have been awarded or may be awarded, and the amount or potential amount of other funding.
 - (B) A regulatory compliance statement certifying that the applicant is currently in compliance with all federal, State, and local air quality rules and regulations at time of application submittal, and is not aware of any outstanding or pending enforcement actions.
- 6. Applicant Non-Disclosure.** An applicant who is found to have applied for or received incentive funds from another entity or program for the same project without disclosing that information as required by these Guidelines shall be disqualified from funding for that project from all sources within the control of an air district or ARB. The air district or ARB may also seek civil penalties for such non-disclosure.
- 7. Subsequent Applications.** An applicant may re-apply for project funding if a previous application for the same project has been rejected by the air district and is no longer being considered for funding.

T. Application Evaluation and Project Selection

1. **Review for Completeness.** Air districts must review all applications for completeness upon receipt, and notify an applicant within 30 working days of receipt if the application is not complete (H&SC § 44288(a)). The air district must make every effort to clearly state to the applicant what is required to make the application complete. The application and all correspondence with the applicant should be kept in the applicant's project file. Additionally, the record of each project's rating and ranking as applicable, receipt date, and other project selection criteria must be maintained with the project file.
2. **Credibility.** Air districts are responsible for determining that project applications are credible, made in good faith, and in compliance with the Moyer Program and its objectives.
3. **Eligibility.** Air districts must ensure that the emission reductions provided by selected projects are eligible and surplus to adopted regulations and other legal requirements. This should include checking to ensure the project meets the minimum requirements in the appropriate source category chapter, including:
 - (A) Documentation of historical vehicle, equipment, or engine usage;
 - (B) Documentation of project costs;
 - (C) Engine or retrofit device Executive Orders, if applicable;
 - (D) Proof of a vehicle compliance check as needed for on-road projects;
 - (E) Other documentation identified in the source category chapter.
4. **Application Tracking.** Air districts must have a system for tracking applications. CARL may be used to satisfy this requirement if an air district enters the data from all applications received into this database, whether the application is provided funding or not. Air districts not using CARL will track the information needed to populate required CARL data fields. A tracking system is not required for air districts receiving under one-half percent of the current fiscal year total Moyer Program Funds, or \$450,000, whichever is less.
5. **Project Selection.** After reviewing applications for project eligibility, the air district must follow its Policies and Procedures Manual in selecting projects to fund. Projects approved for funding must meet all applicable requirements of these guidelines.
6. **Communities with Most Significant Exposure.** Air districts with a population of one million or more residents must select projects from their applicant pools in a way that ensures that 50 percent or more of their Moyer Program funds are expended to reduce air pollution in communities with the most significant exposure to air pollution, including communities of minority and low-income populations (H&SC § 43023.5). Air districts may track this on a cumulative basis.
7. **Project Evaluation.** An air district must evaluate projects to ensure each project selected for funding meets the emission reduction and cost-effectiveness

requirements of the Moyer Program as applicable. Projects may not be funded when CARL indicates these requirements are not met. In such cases, an air district representative believing a project should qualify may contact his or her ARB liaison to further evaluate project eligibility.

- 8. Recordkeeping.** The air district must maintain a file for each project selected for funding. Files may be retained in an electronic format if complete and easily accessible. Unless otherwise specified by source category or in Section K.8., project files must be retained three years following the end of the contract term. In the event final payment has not been issued prior to the end of the contract term, the three-year clock is re-started upon final payment. Applications for unfunded projects must be kept a minimum of two years following the solicitation period, or two years from receipt if there is not a specified solicitation period.
- 9. Subsequent Application and Double-Counting.** Moyer Program participants that received funding and are still under contract may not apply for funding for the same project from the Moyer Program (including a Voucher Incentive Program), from the Proposition 1B Goods Movement Emission Reduction Program, or any other program.
 - (A) If an air district chooses to amend a contract to reduce the term, the amended project must be cost-effective during the reduced contract term, based on the cost-effectiveness values and limit that applied when the original contract was executed. If an air district agrees to accept a prorated repayment of the Moyer Program grant, the repayment and amended contract execution must both occur prior to the execution of any new contract for funding.
 - (B) Emissions reductions from previously funded projects must not be included as emissions benefits of any subsequent project for the Moyer Program (including a Voucher Incentive Program) or the Proposition 1B Goods Movement Emission Reduction Program.

U. Case-by-Case Determination Process

- 1. Limitations.** ARB Moyer Program staff may approve on a case-by-case basis a project that varies from specific requirements of these Guidelines only if such approval will not adversely affect achievement of surplus, quantifiable, enforceable and permanent emission reductions. Case-by-case approvals also may not result in an exceedance of the applicable cost-effectiveness limit, or reduce program transparency, or cause a violation of law or regulation. Air districts are required to request a case-by-case determination even if they believe a project is similar to previously-approved case-by-case projects.
- 2. Procedure.** An air district may request ARB review of the project for a case-by-case determination using the procedure below. After receipt of all

information needed, ARB will respond to the air district within 15 business days with a determination or estimated date of determination.

- (A) The air district will submit the following to the Moyer Program air district liaison:
 - (1) A summary of the request, with reference(s) to the pertinent area(s) of the Guidelines for which the air district is asking for additional guidance and approval;
 - (2) Documents providing information essential to the determination, including but not limited to: baseline and new engine information; the associated ARB engine Executive Orders and/or U.S. EPA Certificates of Conformity for baseline and new engines; other related applicant information from a completed application;
 - (3) Other information and documents as requested by Moyer Program staff.
- (B) ARB will make one of the following determinations:
 - (1) Approved. Approval of a project does not imply or equate to “blanket approval” of other similar projects.
 - (2) Not Approved. Non-approval of a project does not imply or equate to “blanket non-approval” of other similar projects.
 - (3) No Action / Case-by-Case Approval Not Required: ARB evaluation concludes that a case-by-case determination is not required as the request already conforms to the requirements or intent of the Guidelines.

3. Public Availability and Recordkeeping. ARB will post on the Moyer Program website all case-by-case determinations submitted for review. Air districts will keep a copy of the determination, either approved or not approved, in the project file.

4. After Contract Execution. Air Districts should always attempt to request a case-by-case determination prior to contract execution. ARB will consider requests for case-by-case determination subsequent to contract execution only when an unforeseen event leads to a project or program element that varies from the requirements of these Guidelines.

V. Minimum Contract Requirements

1. General Requirements. Except as specified for on-road and off-road voucher incentive programs, air districts participating in the Moyer Program must execute contracts with prospective grantees who will receive funds under the Moyer Program. All Moyer Program project contracts must include the elements described in this section. Projects funded by the Moyer Program may not be used to generate a compliance extension or credit for regulatory compliance. All

executed project contracts and contract amendments must be kept in the air district's project files.

- 2. Party Names and Date.** All contracts must state the name of the air district and the grantee as parties to the contract. Contracts must include signature blocks with an area for the dates the contract is signed, or the execution date must otherwise be clearly indicated in the contract. In any case where digital signature is used in lieu of original signature, the digital signature must comply with California Government Code section 16.5 and Title 2, California Code of Regulations, sections 22000 – 22005.
- 3. Notices.** All contracts must include contact information for both parties to the contract, including how to send and receive notices.
- 4. Funds from Other Sources.**
 - (A) Grantees must certify that they have disclosed all funding sources that they have applied for or received for a project, and that the grantee will notify the air district of additional sources of funding received for the total cost of the project, including any sources that become available after contract execution (H&SC § 44283(g)).
 - (B) Grantees that co-fund a project must meet all criteria associated with each funding source used to fund the project (H&SC § 44287(a)).
 - (C) A grantee that is not a public entity must provide at least 15 percent of a project's Moyer eligible costs from non-public sources (see Section L). The contract must prohibit the grantee from receiving grants and other funds that exceed the total project cost.
 - (D) A grantee may receive Moyer Program funding from multiple air districts for the same project if these entities are coordinating to jointly fund portions of the project. The contract must list the entities involved and funding provided.
- 5. Contract Term.** All contracts must specify the term of the contract. The contract term shall include two time frames – “project completion” and “project implementation” – to ensure that the air district and ARB can fully enforce the contract during the life of the Moyer Program-funded project.
 - (A) **Project Completion.** Project completion is the time frame starting with the date of execution of the contract to the date the project post-inspection confirms that the project has become operational. This includes the time period when an engine, equipment, or vehicle is ordered, delivered and installed. The contract must include a specified time frame in which project completion will occur so that the contract is liquidated within four years from the original date of contract execution. Under no circumstance may the liquidation date be extended beyond four years from the original date of contract execution.

- (B) Project Implementation. The project implementation time frame is the second part of the contract term, and must equal the project life used in the project cost-effectiveness calculation. The contract must specify that the grantee is required to operate and maintain their Moyer Program funded project according to the terms of the contract for the full project implementation period.

6. Project Specifications. All contracts must include detailed information on the baseline and new vehicles, equipment, and/or engines that were used in the project cost-effectiveness calculation. This requirement may be met by including the project application as an attachment to the contract as long as the application is accurate and complete.

- (A) A program-eligible replacement vehicle, equipment and/or engine that is verified or certified to achieve equivalent or greater reductions than the original project replacement vehicle, equipment and/or engine may be substituted with prior approval of the air district.
- (B) At least 24 months of documented and verified historic usage is required for the baseline engine, such as miles traveled, hours operated, or fuel consumed, and in this case usage is not required to be in the contract. If this information is not available, the air district may estimate the usage for the old engine and the estimated usage must be included in the contract.
 - (1) The types of acceptable documentation for establishing historical annual usage will be clearly defined in each air district's Policies and Procedures Manual and will be subject to ARB approval.
 - (2) Additional forms of documentation to verify historical annual usage that are not included in an air district's Policies and Procedures Manual can be evaluated and approved by ARB on a case-by-case basis.
- (C) Contracts must also contain a statement that the project complies with the Moyer Program Guidelines and that the grantee will meet the following requirements:
 - (1) Certify that the grantee's fleet, engine(s), or equipment/vehicle is in compliance with all applicable federal, State, and local air quality rules and regulations at time of contract execution.
 - (2) Maintain compliance with all applicable federal, State, and local air quality rules and regulations for the full contract term.
 - (3) For repower projects, the installation of the engine must be completed in a manner such that it does not void the engine warranty provided by the manufacturer and any remaining warranty provided by the equipment/vehicle manufacturer.
- (D) Contracts must specify the following:

- (1) Projects funded by the Moyer Program must be included when defining the size of the fleet for determining regulatory requirements.
 - (2) Throughout the contract term, projects funded by the Moyer Program must not be used to generate credits or compliance extensions, and must be excluded when determining regulatory compliance.
- 7. Maintenance.** All contracts must require the grantee to maintain the vehicle, equipment, engine, and/or funded infrastructure according to the manufacturer's specifications for the life of the project, and include a prohibition on engine tampering. The grantee must maintain a working hour meter for projects that use hours of operation as a means of calculating emission reductions and cost-effectiveness. If the hour meter fails, the grantee must immediately notify the air district, and remain responsible for validating any hours not recorded by the hour meter. The grantee must either repair or replace the non-operating meter or provide other documentation of equipment operating hours acceptable to the air district.
- 8. Payment.** Before a Moyer Program payment may be made to a project participant, the project contract must be executed, an eligible invoice must be received by the air district, and the project post-inspection must be successfully completed to document the completion of the work specified in the invoice. The equipment must be operational before the final payment is issued. All contracts must include the following payment terms:
 - (A) **Maximum Contract Amount.** The maximum contract amount must not exceed the maximum funding level corresponding to the current program cost-effectiveness limit, nor may the maximum contract amount exceed the project incremental cost. The maximum contract amount must also comply with any funding caps and other criteria for the specific project category as identified in these Guidelines.
 - (B) **Itemized Invoices.** Payment terms must require itemized invoices from the engine or equipment supplier for repowers and infrastructure projects, paid invoices from the vehicle owner for new vehicles, and satisfactory post-inspection by the air district prior to payment of the owner's invoice. An invoice payment for a specific vehicle, engine, or equipment may not exceed the amount indicated on the project contract for that vehicle, engine, or equipment. The contract should be clear that the air district will pay the lower of the contract amount or the final invoice amount. Invoices must meet the minimum requirements of Section Y to be eligible for Moyer Program funding.
- 9. Reporting.** All contracts must include a provision for grantees to submit annual reports commencing no later than 18 months after project post-inspection and continuing annually thereafter throughout the project implementation phase of the

contract. The air district must include the dates the grantee Annual Report is due.

- (A) During the project implementation phase, the air district is responsible for monitoring the project to assure the project is operational and the project emissions reductions are realized.
- (B) The contract must inform the grantee that noncompliance with the reporting requirements will require on-site monitoring or inspection(s).

10. On-Site Inspections, Audits and Records. All contracts must include language that allows the air district, ARB, or their designee to conduct an inspection or audit of the project, including the engine, vehicle or equipment and associated records, during the contract term. Contracts must also require the owner to maintain and retain usage and other records associated with the project for at least three years after the end of the contract term.

11. Repercussions for Nonperformance. Air districts must include repercussions for non-compliance with the obligations of the contract.

- (A) The contract must specify that by executing the contract, the grantee understands and agrees to operate the vehicle, equipment, and/or engine according to the terms of the contract and to cooperate with the air district and ARB in implementation, monitoring, enforcement, and other efforts to assure the emission benefits are real, quantifiable, surplus, and enforceable.
- (B) The contract must describe the repercussions to the grantee for noncompliance with contract requirements, including but not limited to cancelling the contract and recapturing project funds in proportion to any loss of emission reductions or underutilization as agreed to in the contract (H&SC § 44291(c)).
- (C) The contract must inform the grantee that ARB and the air district have the authority to seek any remedies available under the law for noncompliance with Moyer Program requirements and nonperformance with the contract.
- (D) The contract must state that ARB, as an intended third party beneficiary, reserves the right to enforce the terms of the contract at any time during the contract term to ensure emission reductions are obtained.

W. Project Pre-Inspection

1. Requirements. Upon confirming a project's eligibility the air district must complete a pre-inspection prior to contract execution, except as specified in this section.

- (A) All projects must be pre-inspected personally by air district staff, except that air districts may choose to allow public agencies (e.g., public works departments, transit organizations, and school districts) to provide

documentation of the engine(s), equipment, and usage in lieu of a pre-inspection.

- (B) Air districts receiving less than one-half of one percent of the current fiscal year total Moyer Program Funds, or \$450,000, whichever is less, may reduce their required project pre-inspections to a minimum of 25 percent of the total number of projects associated with the current fiscal year funds. At least one project must be selected from each source category funded, however.

2. Documentation. The pre-inspection form and information to be documented must include, at a minimum, the following:

- (A) Information regarding the baseline engine, vehicle, or equipment as needed to uniquely identify, establish eligibility, provide a basis for emission calculations, populate the CARL database, and ensure contract enforceability. Such information includes (as applicable) make, model, year, horsepower, fuel type, engine family, engine tier, serial number, vehicle identification number (VIN), and any additional information pertinent to the project. Engines without a visible and legible serial number must be uniquely identified by having the engine block stamped with a Moyer Program number or alternative permanent marking such as an engine tag.
- (B) The project usage (hours or miles) meter reading if used in the project cost-effectiveness calculation. The inspector must verify that stated project usage is reasonable given the usage meter reading.
- (C) Verification that the engine is operational (with a start-up) and that the engine is working as described in the application (document function and use).
- (D) Photo documentation of the engine, vehicle, or equipment information. The photos must include the legible serial number of the engine (if available) and/or any other identifying markings.
- (E) Other relevant information including, but not limited to:
 - (1) Name of inspector;
 - (2) Date of inspection;
 - (3) Name and contact information of engine or equipment owner; and
 - (4) Location of the engine or equipment.

3. Compliance Certification. No later than the time of pre-inspection the air district must obtain certification and submission of supporting documentation from the applicant that their engine(s), vehicle/equipment, or project fleet is currently in compliance with the applicable rules or regulations affecting the engine(s), vehicle/equipment for which they are requesting funding.

4. **Recordkeeping.** The air district must maintain a hard copy of the completed pre-inspection form in the air district's project file.
5. **Inspection after Contract Execution.** The project pre-inspection must be completed prior to a project contract execution and the information in the contract must be consistent with the information gathered during the pre-inspection. An air district may apply to ARB for approval to conduct pre-inspections after contract execution only on a case-by-case basis. Case-by-case approval of such a procedure will depend upon the following conditions being met:
 - (A) The air district describes the program benefits it would achieve by conducting pre-inspections after contract signature.
 - (B) The project contract includes language to indicate contract terms may be adjusted or the contract may be deemed void based upon information collected during the pre-inspection. The air district must also include a process for informing the prospective grantee of such.
 - (C) The air district's Policies and Procedures Manual clearly specifies the process for conducting pre-inspections after contract execution and any additional procedures enacted to ensure the project achieves real, surplus, enforceable, and quantifiable emission reductions. Work on the project engine, vehicle, or equipment may not commence until after the pre-inspection.

X. Project Post-Inspection

1. **Requirement.** An air district must gather and document post-inspection information on all projects funded under the Moyer Program. For post-inspection of infrastructure projects, see Chapter 10 for further guidance.
 - (A) The air district will conduct a post-inspection after it receives an invoice for a project from the grantee or otherwise receives notice the project is complete. Information on the invoice must be consistent with the information gathered at the post-inspection. If the post-inspection occurs before the air district receives the project invoice, the invoice must be reviewed for consistency with the new engine, vehicle, or equipment information from the post-inspection form.
 - (B) When 20 or more vehicles are included in a vehicle replacement project for a public fleet or transit agency, the air district is not required to post-inspect each replacement vehicle, but must inspect no fewer than five percent of the vehicles included in the project.
 - (C) The inspector must record, at a minimum, information regarding the new project engines, vehicles/equipment, and retrofit devices as needed to uniquely identify, establish eligibility, provide a basis for emission calculations, and ensure contract enforceability. Information sufficient to populate all required fields in CARL must be recorded. Submersible pump

inspections may have the applicant take a picture of the motor name plate information including, make, model, and serial number prior to installation inside the irrigation well. The air district will verify the make, model and horsepower rating information with the project invoice.

- (D) The engine must be operational in the equipment or vehicle as stated in the contract. The inspector must visually witness all engine startups and operation of all mobile projects.
- (E) The engine, vehicle/equipment, and retrofit information must be documented with photos. The photos must include the serial number of the engine or retrofit (if legible) and/or any other identifying markings. Photos of the scrapped or destroyed engine must be included.
- (F) The post-inspection form must also contain other relevant information including, but not limited to:
 - (1) Name of inspector;
 - (2) Date of inspection;
 - (3) Name and contact information of engine or equipment owner; and
 - (4) Location of the engine or equipment.
- (G) The air district must maintain a hard copy of the completed post-inspection form in the air district's project file.

2. Equipment Labels. Post-inspection of a retrofit device requires the collection of additional information from the labels affixed on both the retrofit device and the engine. If the proper labels are missing, payment may not be made until this is corrected. Potential scenarios are summarized below, which air district staff must address prior to payment:

- (A) The retrofit device is properly labeled but the engine lacks a label: An engine label should be readily obtainable from the retrofit manufacturer by reference to the serial number. The air district may make payment once the grantee has been informed that the engine must also be labeled.
- (B) The retrofit device is labeled but the label does not have the required items: The air district may make payment once it gets approval from ARB regarding an approved alternate label or a compliant label has been installed on the retrofit device.
- (C) The engine is properly labeled but the retrofit device lacks a label: The air district may make payment once a compliant label has been installed on the retrofit device.
- (D) No label is found on either the engine or the retrofit device: The air district may make payment once a compliant label has been installed on both the engine and the retrofit device.

3. **Electric Motors.** Post-inspection of a new electric motor on an agricultural pump must also include recording of the serial number of the variable frequency device if the project includes one.
4. **Verification of Destruction.** The air district must verify that the existing (old) engine is destroyed and rendered permanently unusable and irreparable, consistent with requirements in the source category chapters of these guidelines and with the air district Policies and Procedures Manual.
 - (A) Air district staff must verify and document through photographic or video evidence that the destroyed engine serial number matches that on the project contract.
 - (B) Air district staff must verify that engines without a visible and legible serial number are uniquely identified by the correct air district stamp or other permanent marking prior to engine destruction.
5. **Consistency with Contract.** The air district must verify that the information collected in the post-inspection is consistent with the project contract.

Y. Project Invoice and Payment

1. **Prior to Payment.** Except as specified below, an air district will make payment for a project or equipment only after air district post-inspection finds the project or equipment in place and operational, and the district receives an invoice itemized in sufficient detail to ensure that only completed and eligible project costs are reimbursed, and other sources and amounts of funding for the project are reviewed to ensure the sum of all project funds does not exceed the total project cost (per Section L). Exceptions are limited to progress or partial payments in cases where the grantee provides the air district with sufficient evidence of completing milestones specified in the contract, consistent with conditions specified in air district Policies and Procedures. The air district must maintain a clear record of progress payments in the project file and in records of the district administration or fiscal unit. Progress payments include final payments that are withheld until all reporting requirements are met (also known as “withheld payments”).
2. **Eligible Costs.** Equipment and parts on engine repower or retrofit projects are eligible for funding only if they are required to ensure the effective installation and functioning of the new engine or retrofit, and are not part of typical vehicle or equipment maintenance or repair. Taxes and the installation and transport costs for eligible hardware are eligible for funding at the air district’s discretion. For labor expenses paid, the invoice must detail the number of hours charged and the hourly wage. See source category chapters for additional specification of eligible costs.

- 3. Ineligible Costs.** Ineligible repower costs include tires, axles, paint, brakes, and mufflers. See source category chapters for additional specification of ineligible costs.
- 4. Limitations on Applicant Action before Air District Approval.** An applicant may not order or make a down payment on a new engine, piece of equipment, or vehicle prior to contract execution or approval by the air district governing board or board designee. Dealers ordering engines, equipment, or vehicles prior to air district approval of grant applications assume all financial risk and are in no way ensured program funds. A grantee may not receive engines, equipment, or vehicles, nor may work begin on a repower or retrofit project, until the project contract is fully executed, unless the air district has provided the potential grantee with written notification that any work performed is not guaranteed funding until a contract is executed. For infrastructure projects, discretionary costs may be accrued by an applicant prior to contract execution, but such costs are not reimbursable until after contract execution.
- 5. Invoice Procedures.** The air district will maintain copies of all invoices and documentation of payment in the project file or otherwise keep copies on-site at the air district office and be readily available. Invoices received after the project post-inspection has been complete must be evaluated for consistency with the information gathered during the project post-inspection. Additional project invoicing requirements may also be included in the source category chapters of these guidelines.
- 6. On-Road Compliance Checks.** For all on-road and emergency vehicle projects, should a compliance check indicate that there is an outstanding violation with any vehicle in the applicant's fleet, no payment may be made until the applicant provides proof to the air district that each violation has been corrected and each fine has been paid.
- 7. Regulatory Compliance.** Where a contract requires a grantee to demonstrate that specific regulatory compliance requirements have been met in order to receive funding (such as engines subject to the Portable Equipment Airborne Toxic Control Measure), air districts may not pay invoices until the grantee has provided documentation that the requirements have been met. A project participant may demonstrate this via a detailed letter signed by the vehicle or equipment owner or legal representative or, if the regulation requires ARB (or the air district) to certify compliance, through ARB (or air district) certification. For more information, see the associated source category chapter. Air districts are not to be held liable if a grantee falsifies this documentation.
- 8. Payment Recipients.** Payments typically will be made directly to the grantee. Payments may be made directly to a dealer or distributor only if such payment arrangements are specified in the contract.

Z. Grantee Annual Reporting

1. **Requirement.** Air districts will require all grantees to submit annual reports within 18 months of the project post-inspection and annually thereafter for the term of the contract.
2. **Report Format.** The air district will prescribe a format for the project annual report, to include the following information:
 - (A) Grantee name, address, and telephone number.
 - (B) Information needed to uniquely identify the project engine, vehicle, or equipment, such as engine make, model, horsepower, and serial number.
 - (C) Estimated percentage of time the vehicle or equipment has been operated in California since the previous annual report.
 - (D) Readings of the usage device (e.g., hour meter, odometer, or electronic monitoring unit).
 - (E) Except for projects in which usage is not required to be specified in the contract (as allowed per Section V.6.(B)(1) above), if usage is more than 30 percent below that identified in the project application, the grantee must describe any conditions that are likely to have affected project usage, such as weather, permits, or major maintenance. In instances where annual usage is significantly lower than the contracted level due to unforeseen circumstances beyond the control of the grantee, the grantee may request a waiver from the air district per Section BB(4).
3. **Air District Review.** The air district will review the annual report for completeness, accuracy, and reported usage, and will maintain in the project file a copy of the report that is initialed and dated by the reviewing staff. An air district choosing an alternative method to indicate its review and approval of annual reports will specify the method in its Policies and Procedures Manual.
4. **Unsatisfactory Reporting.** If an annual report is incomplete, inaccurate or not received from the grantee on schedule, the air district will make a reasonable attempt to obtain a complete and accurate report from the grantee. If the air district is unable to obtain the report, the air district will identify the project for audit as described in Section AA below.
5. **Subsequent Grants.** Grantees that have not submitted complete required reports will not be granted funds for new Moyer Program projects until all reports are satisfactorily submitted.

AA. Air District Audit of Projects

1. **Requirement.** The air district will conduct audits of projects funded with Moyer Program funds. On an annual basis these audits will include five percent of

active projects or 20 active projects (whichever is less), including any audits conducted following unsatisfactory annual reporting as described in Section Z.4.

2. **Project Inspection.** Audits must be completed by air district staff and will at a minimum include an inspection that verifies that the engines, equipment, and emission control devices paid for are still owned by the grantee named in the contract, are still operational in the same equipment, and meet the mileage, fuel usage, or hours of operation indicated in the executed contract. This must be performed by checking the serial number of the engine; witnessing the operation of the engine; and checking the usage meter or fuel receipts.
3. **Multiple Equipment.** Audits of multiple equipment or engine projects of up to 25 pieces must include inspection of at least two pieces or equipment, and for projects of over 25 pieces must include inspection of at least five pieces.

BB. Nonperforming Projects

1. **Requirement.** The air district will work with nonperforming project grantees to ensure Moyer Program project requirements are met and emission reductions are achieved, consistent with procedures outlined in the district Policies and Procedures Manual. Air districts may consider unforeseen circumstances beyond the grantee's control in determining repercussions for nonperformance.
2. **Off-Road Contract Extension.** Off-road contracts for which usage requirements are not being met may be extended to capture the required usage, even if the contract extension overlaps the required compliance date. This revision only applies to off-road contracts that have been executed prior to August 15, 2008, and does not modify similar Moyer policy for other eligible categories.
3. **Recapturing Funds.** When an air district is not successful in gaining grantee compliance with the usage and program requirements specified in a contract, the district will make all reasonable efforts to recapture Moyer Program funds from the grantee. Recaptured funds will be reassigned to projects that achieve the shortfall in emission reductions or usage. The air district's efforts to recapture funds may be guided by circumstances such as suspected or actual fraud or misuse of funds, the amount of Moyer Program funding involved, or the ability of the grantee to repay the funds.
4. **Usage Threshold and Waiver Procedure.** The air district must take appropriate action to ensure emission reductions are realized for engines, equipment, vehicles or fleets, as well as usage for infrastructure projects. Except for projects in which usage is not required to be specified in the contract (as allowed per Section V.6.(B)), when average usage over a three year period for a contracted engine, equipment, vehicle or fleet is less than 70 percent of the activity required in the contract, the air district may choose, but is not limited to, the options below to address the underutilization. (In cases of projects which

may have a contracted project life of less than three years, the same activity threshold of less than 70 percent applies, averaged over the project life.)

- (A) Extend the project contract for additional years (precluding overlap with an applicable rule implementation requirement).
- (B) Return funds in proportion to the loss in emission reductions.
- (C) Transfer ownership of the engine, vehicle, or equipment to another entity committed to complying with the contract terms.
- (D) Recalculate a project's cost-effectiveness based on the reported decrease in usage. Based on this recalculation, if the project is still below the cost-effectiveness limit, consistent with the limit and methodology in effect on the date of contract execution and prior to the end of the contract, the air district must continue to monitor the project over the next year to determine if additional actions are necessary. (This option does not apply to infrastructure projects not subject to a cost-effectiveness limit.)
- (E) Grant a usage waiver, without penalty, to the grantee for a defined time period. The grantee must demonstrate to the air district's satisfaction that the engine, vehicle, or equipment is not being underutilized in favor of operating other, higher-polluting equipment, and that the underutilization was due to unforeseen conditions beyond the grantee's control.
 - (1) The conditions under which a waiver may be issued include, but are not limited to, the following:
 - a. A decrease in usage due to economic recession;
 - b. Unforeseen fluctuations in water allocations or pumping needs for agricultural irrigation pump engines; or
 - c. Significant land fallowing for off-road agricultural equipment and agricultural irrigation pump engines.
 - (2) To be considered for a waiver, the grantee must provide a written request to the air district along with documentation that substantiates the need for the waiver and verifies that higher-polluting equipment is not consequently receiving more use.
 - a. The air district will specify the length of time for which the waiver is valid. The waiver will not exempt the grantee from any contract requirement to provide annual usage reports.
 - b. The waiver will be documented in writing, approved by the Air Pollution Control Officer or designee, and included in the project file.
 - (3) For projects that include multiple pieces of equipment or engines the air district may review and recalculate the funded equipment collectively to see if the project as a whole has performed as expected. A waiver is not required in this event.

- 5. Funds Recaptured Following ARB Enforcement.** Program funds recaptured from a project grantee as a result of a settlement agreement executed by ARB shall be returned to the air district that granted the funds. Any penalties resulting from a settlement agreement executed by ARB or the Attorney General shall be deposited in the Air Pollution Control Fund (H&SC § 44291(e)).

CHAPTER 5: OFF-ROAD EQUIPMENT

This chapter describes the minimum criteria and requirements for Carl Moyer Memorial Air Quality Standards Attainment Program (Moyer Program) mobile, portable and stationary, off-road compression-ignition (CI or diesel), and large spark-ignition (LSI) projects such as construction, agricultural, and industrial equipment. Air quality management districts or air pollution control districts (air districts) may set more stringent requirements based upon local priorities.

A. Projects Eligible for Funding

The following off-road equipment projects may be eligible for funding.

- 1. Repower of Existing Equipment.** The replacement of the existing engine with a newer emission-certified engine instead of rebuilding the existing engine to its original specifications.
- 2. Retrofit Purchase.** The installation of an Air Resources Board (ARB) verified emission control system on an existing engine. Examples include, but are not limited to particulate filters and diesel oxidation catalysts.
- 3. Equipment Replacement.** The purchase of new or used equipment with an engine certified to the current emission standard or Tier to replace an older, fully functional piece of equipment that is to be scrapped.
- 4. Infrastructure.** See the infrastructure chapter (Chapter 10) for details regarding applicant eligibility and project types for infrastructure in support of off-road equipment. This includes infrastructure such as alternative fuel and charging stations for construction, cargo handling, and ground support equipment, as well as agricultural pump electrification.

Please see Sections C and D for determining maximum grant amounts and minimum eligibility requirements for all off-road project categories.

B. Engine Emission Standards

ARB and the United States Environmental Protection Agency (U.S. EPA) have adopted regulations for exhaust emission standards for new off-road CI and LSI engines and equipment. For reference, Tables 5-1 and 5-2 below summarize the hydrocarbon (HC), oxides of nitrogen (NO_x), and particulate matter (PM) standards in grams per brake-horsepower-hour (g/bhp-hr) for off-road CI Tier 1, 2, 3, and 4 engines. The actual standards, in grams per kilowatt-hour (g/kW-hr), may be found in the California Code of Regulations (CCR), title 13, sections 2449, et seq. Table 5-3 summarizes the exhaust emission standards for LSI engines. The complete emission standards for LSI engines may be found in the CCR, title 13, sections 2430, et seq.

**Table 5-1
ARB and U.S. EPA Tier 1, 2, and 3 Exhaust Emission Standards for
New Off-Road Diesel Engines \geq 25 Horsepower (hp)
grams per brake horsepower-hour (g/bhp-hr)**

Maximum Rated Power hp (kW)	Tier	Model Year	NOx	HC	NOx + NMHC	PM
25≤hp<50 (19≤kW<37)	Tier 1	1999-2003 ^(a)	—	—	7.1	0.60
	Tier 2	2004-2007	—	—	5.6	0.45
50≤hp<75 (37≤kW<56)	Tier 1	1998-2003 ^(a)	6.9	—	—	—
	Tier 2	2004-2007	—	—	5.6	0.30
	Tier 3 ^(b)	2008-2011	—	—	3.5	0.30
75≤hp<100 (56≤kW<75)	Tier 1	1998-2003 ^(a)	6.9	—	—	—
	Tier 2	2004-2007	—	—	5.6	0.30
	Tier 3	2008-2011	—	—	3.5	0.30
100≤hp<175 (75≤kW<130)	Tier 1	1997-2002 ^(a)	6.9	—	—	—
	Tier 2	2003-2006	—	—	4.9	0.22
	Tier 3	2007-2011	—	—	3.0	0.22
175≤hp<300 (130≤kW<225)	Tier 1	1996-2002	6.9	1.0	—	0.40
	Tier 2	2003-2005	—	—	4.9	0.15
	Tier 3 ^(c)	2006-2010	—	—	3.0	0.15
300≤hp<600 (225≤kW<450)	Tier 1	1996-2000	6.9	1.0	—	0.40
	Tier 2	2001-2005	—	—	4.8	0.15
	Tier 3 ^(c)	2006-2010	—	—	3.0	0.15
600≤hp≤750 (450≤kW≤560)	Tier 1	1996-2001	6.9	1.0	—	0.40
	Tier 2	2002-2005	—	—	4.8	0.15
	Tier 3 ^(c)	2006-2010	—	—	3.0	0.15
hp>750 (kW>560)	Tier 1	2000-2005	6.9	1.0	—	0.40
	Tier 2	2006-2010	—	—	4.8	0.15

^(a) EPA model year. ARB model year for Tier 1 starts at 2000 for 25 hp ≤ to <175 hp.

^(b) Engine families in this power category may meet the Tier 3 PM standard instead of the Tier 4 interim PM standard in exchange for introducing the final Tier 4 PM standard in 2012.

^(c) Caterpillar, Cummins, Detroit Diesel Corporation, and Volvo Truck Corporation agreed to comply with these standards by 2005.

**Table 5-2
ARB and U.S. EPA Tier 4 Exhaust Emission Standards for
New Off-Road Diesel Engines \geq 25 hp
(g/bhp-hr)**

Maximum Rated Power hp (kW)	Tier	Model Year	NOx	HC	NOx + NMHC	PM
25≤hp<50 (19≤kW<37)	Tier 4 Interim	2008-2012	—	—	5.6	0.22
	Tier 4 Final	2013 and later	—	—	3.5	0.02
50≤hp<75 (37≤kW<56)	Tier 4 Interim ^(a)	2008-2012	—	—	3.5	0.22
	Tier 4 Final	2013 and later	—	—	3.5	0.02
75≤hp<100 (56≤kW<75)	Tier 4 Phase-In	2012-2014	0.30	0.14	—	0.01
	Tier 4 Phase-Out		—	—	3.5	0.01
	Tier 4 Alternate NOx ^(b)		2.50	0.14	—	0.01
	Tier 4 Final	2015 and later	0.30	0.14	—	0.01
100≤hp<175 (75≤kW<130)	Tier 4 Phase-In	2012-2014	0.30	0.14	—	0.01
	Tier 4 Phase-Out		—	—	3.0	0.01
	Tier 4 Alternate NOx ^(b)		2.50	0.14	—	0.01
	Tier 4 Final	2015 and later	0.30	0.14	—	0.01
175≤hp<750 (130≤kW<560)	Tier 4 Phase-In	2011-2013	0.30	0.14	—	0.01
	Tier 4 Phase-Out		—	—	3.0	0.01
	Tier 4 Alternate NOx ^(b)		1.50	0.14	—	0.01
	Tier 4 Final	2014 and later	0.30	0.14	—	0.01
hp>750 (kW>560)	Tier 4 Interim	2011-2014	2.60	0.30	—	0.07
	Tier 4 Final	2015 and later	2.60	0.14	—	0.03

^(a) Engine families in this power category may meet the Tier 3 PM standard instead of the Tier 4 interim PM standard in exchange for introducing the final Tier 4 PM standard in 2012.

^(b) The implementation schedule shown is the three-year alternate NOx approach. Other schedules are available.

**Table 5-3
Exhaust Emission Standards for
New Off-Road LSI Engines >1.0 liter
(g/bhp-hr)**

Model Year	NOx+ Non-Methane Hydrocarbons (NMHC)
2001-2006 ^(a)	3.0
2007-2009	2.0
2010 and later	0.6

^(a) Standards phased in from 2001 – 2004

C. Maximum Eligible Funding Amounts (Determining Grant Amounts)

1. Table 5-4 summarizes the maximum eligible funding for each project type as a percentage. All projects are also subject to the cost-effectiveness limits specified in Appendix C.

**Table 5-4
Maximum Percentage Eligible for
Moyer Program Off-Road Projects**

Project	Maximum Percentage Eligible
Diesel repower	85%
LSI repower	85%
Repower to zero-emission	85%
Mobile equipment replacement	80%
Portable equipment replacement (excludes stationary)	80%
Retrofit	100%

The ARB has adopted in-use fleet rules affecting equipment with off-road CI and off-road LSI engines. For equipment subject to these rules, additional limitations may apply according to Sections E through I.

2. Project Life:

- (A) Maximum project life

**Table 5-5
Maximum Project Life**

Type		Project Life
Repower only (no retrofit)		7 years
Farm equipment ⁽¹⁾ (all projects)		10 years ^(a)
Replacement and repower to zero-emission		10 years ^(b)
Retrofit only		5 years
Replacement	Excavators Skid steer loaders Rough terrain forklifts	3 years
	All other non-farm (existing diesel only)	5 years
	All other non-farm (existing LSI only)	3 years

^(a) Air districts are required to offer a ten year project life for farm equipment; however, applicants may request a project life fewer than ten years. Farm equipment is defined in Appendix B and does not include stationary agricultural equipment.

^(b) Section C.2.(E) allows a maximum project life of ten years for zero-emission replacements.

- (B) The maximum project life does not consider regulatory requirements that may shorten the eligible project life. Regulatory requirements may reduce actual project lives below these maximum values.
- (C) Unless otherwise stated in this chapter (see Sections D.2.(I) and E.2.(H)(1)), the minimum project life allowed is three years.
- (D) In accordance with SBx2 3 (Health and Safety Code (H&SC) § 44282.5(a)), mobile and portable farm equipment may be eligible for funding up to the compliance date of an applicable in-use regulation and a 10-year project life. In order to be eligible, farm equipment projects must be under a fully executed contract, and must be installed in the equipment and in operation prior to the applicable compliance date.
- (E) For zero-emission replacement equipment, Senate Bill 467 (H&SC § 44287.1) allows the replacement of off-road internal combustion equipment with zero-emission off-road equipment to incorporate the maximum life allowed of the equipment being scrapped (three to five years, as applicable per Section C.2.(A)) and the remaining useful life up to ten years of the equipment the applicant would have bought at the time

of normal attrition (five to seven years, as applicable). For zero-emission replacement of off-road equipment, the emission benefits from two separate transactions may be included in the cost-effectiveness calculations:

- (1) Emission reductions from existing older equipment, as applicable, to zero-emission equipment.
- (2) Emission reductions from a new piece of equipment meeting the emission standards at the time of purchase to zero emission.

2. Usage. Cost-effectiveness calculations must be hour-based. Calculation of funding amounts must be based on the average of at least the two most recent years of documented equipment usage. For projects in which the two most recent years of documented usage are not available, the minimum annual usage is required to be specified in the contract (Chapter 3, Section V.6.(B)). Fleet averages cannot be used. All project engines or equipment must have a fully operational hour meter for the project life. If during the project life the hour meter fails for any reason, the hour meter must be repaired or replaced as soon as possible at the owner's expense.

D. Project Criteria

The minimum qualifications for off-road projects are listed below. All projects must also conform to the requirements in Chapter 2: General Criteria and in Chapter 3: Program Administration. Participating air districts retain the authority to impose additional requirements in order to address local concerns.

1. General Criteria:

- (A) New and existing CI and LSI engines greater than or equal to 25 horsepower on mobile or portable off-road equipment and stationary agricultural equipment are eligible for funding. LSI engines above 25 horsepower but with a displacement of less than or equal to one liter may be eligible for funding on a case by case basis.
- (B) Air districts have discretion to use good engineering judgment to determine project horsepower for an existing or new engine or equipment based on the engine label, manual, engine records, or other verifiable records.
- (C) For existing equipment in which the actual engine horsepower cannot be determined based upon the engine label, manual, and engine records, air districts may determine existing engine horsepower by the following formula: Engine horsepower = Power Take Off (PTO) x 120 percent.

- (D) Future annual hours of equipment operation for determining emission reductions must be based upon readings from an installed and fully operational hour meter.
- (E) The certification emission standard and/or Tier designation for the existing engine (if applicable) and the new engine must be determined from the ARB Executive Order or U.S. EPA Certificate of Conformity (for federally preempted engines) issued for that engine. ARB Executive Orders for off-road engines may be found at <http://www.arb.ca.gov/msprog/offroad/cert/cert.php>.
- (F) For existing equipment with engines manufactured under the flexibility provision, detailed in CCR, title 13, section 2423(d), the baseline emission rates shall be determined by using the previous applicable Tier emission standard for the existing engine model year and horsepower rating. Alternatively, the baseline emission rates may be determined based upon the standard or Tier associated with the actual reference family listed on the emission control information label of the existing equipment. The ARB Executive Order for these engines indicates that the engines are certified under the flexibility provision. Air districts must retain this documentation in the project file.
- (G) New engines that are participating in the “Tier 4 Early Introduction Incentive for Engine Manufacturers” program, as detailed in CCR, title 13, section 2423(b)(6), are eligible for funding provided that they are certified to the Tier 4 Final emission standards. The ARB Executive Order for these engines indicates that the engines are certified under this provision. The emission rates for these engines used to determine cost-effectiveness shall be equivalent to the emission factors associated with Tier 3 engines. Air districts must retain this documentation in the project file.
- (H) Notwithstanding Section D.1.(J) below, new engines certified to the interim Tier 4 (interim Tier 4, Tier 4 Phase-Out, Tier 4 Phase-in/Alternate NOx) and Tier 4 Final emission standards participating in the averaging, banking, and trading program that are certified to FEL higher than the applicable emission standards are eligible for funding. The appropriate emission factor for calculating emission reductions and cost-effectiveness shall be equivalent to the emission factors associated with the Tier 3 for engines 50 to 750 horsepower and Tier 2 for engines less than 50 horsepower or greater than 750 horsepower.
- (I) Notwithstanding section D.1.(J) below, new engines certified to the interim Tier 4 and Tier 4 Final emission standards participating in the averaging, banking, and trading program that are certified to a FEL below the applicable emission standards are eligible for funding. The appropriate emission factor for calculating emission reductions and cost-effectiveness

shall be the emission factor associated with the applicable interim Tier 4 (interim Tier 4, Tier 4 Phase-Out, Tier 4 Phase-in/Alternate NOx) or Tier 4 Final emission standard.

- (J) New engines eligible for off-road projects must meet the current applicable standard or Tier. If repowering or replacing with an engine meeting the current applicable standard is technically infeasible, unsafe, or not available when the air district commits to the proposed project, the new engine must meet the most practicable previously applicable emission standard. For purposes of this section, the air district's commitment (as defined in Appendix B) to a proposed project shall be consistent with that stated in their Policies and Procedures Manual. The air district shall determine eligibility of repower and replacement projects using an engine certified to a previous emission standard using the criteria listed below:
- (1) At the applicant's request, confirmation of availability of an engine meeting the most recent emission standards or Tier may be limited to the same manufacturer as the existing engine.
 - (2) If the air district and the applicant do not execute a contract for the project within six months of project commitment, then the air district must recheck for the availability of engines meeting the current standard.
 - (3) Documentation that engines meeting the current applicable standards are unavailable must be included in the air district's project file. Acceptable documentation that engines meeting the most recent emission standards are unavailable include:
 - a. Verifiable information from the engine manufacturer, engine distributor, and/or engine dealer regarding the unavailability of engines meeting the current emission standards or Tier.
 - b. Confirmation (a written declaration by the air district is acceptable) that engines from a specific manufacturer meeting the current emission standards or Tier are not certified (Executive Order is not available on ARB website). Executive Orders for off-road engines may be found at <http://www.arb.ca.gov/msprog/offroad/cert/cert.php>.
 - c. For repower projects, a written statement of reason(s) provided by the engine manufacturer verifying that a particular piece of equipment cannot accommodate an engine meeting current standards without major modifications or safety risks. The letter must include information on the equipment being repowered, the engine being replaced, the reason why an engine meeting the currently applicable standard cannot be used (including

applicable supporting documentation), and the proposed replacement engine. Air districts must retain the written statement of reasons in the project files.

- d. For repower projects, the engine manufacturer has provided ARB with sufficient information on engine and/or equipment models for which repowers are available, and engine and/or equipment models for which repowers are not available or feasible. Engine manufacturers who are interested in pursuing this option should contact ARB. ARB staff will maintain a list of such engines and/or equipment models and make that list available to air district staff.
- (K) Existing zero- or low-emission equipment are required for worker safety in the following industries, and therefore these projects are not eligible for funding: food retail stores, cold storage, and confined space operations (such as freezers).
- (L) The horsepower rating for the replacement engine must not be greater than 125 percent of the original manufacturer rated horsepower (baseline horsepower) for the existing engine. In limited situations, such as where equipment in the original horsepower range is not available or the higher horsepower equipment will result in equal or lower annual emissions, the air district may approve a greater than 25 percent increase in horsepower.
- (M) Notwithstanding D.1.(L), at an air district's discretion, new engines or equipment may be funded with horsepower greater than 125 percent of existing equipment. However, the eligible funding amount must be based upon the cost of an engine or equipment whose horsepower is no higher than 125 percent of the existing engine horsepower. The applicant must pay the additional costs associated with the higher horsepower engine, and the emission reduction calculation must be based upon the funded (higher horsepower) engine. The air district's project file must include documentation of the cost of the funded (higher horsepower) equipment as well as the method used to determine the basis for the project grant amount (e.g. dealership cost estimate of lower horsepower equipment).
- (N) New electric motors and equipment that are rated less than 19 kW are eligible for funding provided it can serve the same function and perform the same work as equipment with a 25 horsepower or greater engine that it is replacing.
- (O) No funds will be issued for maintenance or repairs related to the operation of the existing or new equipment. The participant takes sole responsibility for ensuring that the engine and/or equipment is/are in operational condition throughout the agreement period.

- (P) Existing engines replaced as part of an off-road project must be destroyed and rendered useless. At a minimum, the destruction of an engine must include:
- (1) A hole in the engine block with a diameter of at least three inches at the narrowest point. The hole must be irregularly shaped (i.e. no symmetrical squares or circles) and
 - (2) A section of the oil pan flange must be removed as part of the hole or have a line cut through it that connects the hole.
- (Q) For portable/stationary agricultural projects, State and air district rules impacting agricultural sources must be considered when determining whether projects provide emission reductions surplus to regulatory requirements. Moyer eligibility may be based on the requirements of the local rule if the local rule meets the requirements of Health and Safety Code section 39666(d). An air district requesting to have eligibility based on local rules must have its Air Pollution Control Officer self-certify via email or letter to their ARB Moyer liaison that the local rule is equally as effective as or more stringent than the Airborne Toxic Control Measure for Stationary Compression Ignition Engines (CCR, title 17, section 93115 et. seq.). Note: The self-certification described in this section applies solely to the Moyer Program and does not relieve the air district of their responsibilities under Health and Safety Code section 39666 or any other ARB program or requirement.

2. Repower

- (A) New engines manufactured under the “Flexibility Provisions for Equipment Manufacturers” as detailed in CCR, title 13, section 2423(d), are ineligible for funding to repower equipment.
- (B) New engines manufactured under the “replacement engine” provisions of CCR, title 13, section 2423(j) and/or the provisions of 40 Code of Federal Regulations (CFR) 1068.240 which are used to repower equipment are eligible for funding.
- (C) For repower plus retrofit projects, the cost of data logging the replacement engine is not eligible. Please refer to Section D.3. for additional criteria.
- (D) For repower projects with new off-road compression-ignition engines equipped with original engine manufacturer after treatment devices, addition of a retrofit is ineligible due to issues with engine warranty and anti-tampering provisions.
- (E) Repower to convert to zero-emission technology is eligible for funding. Except for stationary agricultural equipment, zero-emission repower

projects must include a three-year or 5,000-hour warranty. The warranty must cover zero-emission system parts and labor.

- (F) Variable frequency devices (VFD) may be eligible for funding provided the air district reports VFD cost and serial number information in the Clean Air Reporting Log (CARL).
- (G) In stationary electric motor projects, the grantee must provide documentation of application or payment to the local utility company for power installation.
- (H) An electric motor on an agricultural irrigation pump project that is under contract may be considered for invoice payment once the motor has been delivered to the project site, and the motor has been connected to the electricity grid.
- (I) For portable/stationary agricultural projects, except for remotely located or less than 50 hp agricultural engines (as defined in Appendix B), only Tier 3 engines are eligible to be repowered. These must repower to Tier 4 Final engines. Air districts with a local rule may repower uncontrolled, Tier 1, and Tier 2 engines to Tier 4 Final engines as long as there is at least one year of surplus emissions reductions prior to the compliance date of the local rule for the specific tier. The minimum project life in these instances is one year. When repowering a Tier 3 engine, air districts are encouraged to consider the feasibility of repowering with zero-emission technology, such as an electric motor, over a Tier 4 Final engine.

3. Retrofit

- (A) Existing off-road CI engines equipped with original engine manufacturer aftertreatment devices are ineligible for funding.
- (B) The retrofit must be verified by ARB to the highest level available for the engine being retrofitted.
- (C) Eligible project costs include:
 - (1) Retrofit system (including all essential components)
 - (2) Installation
 - (3) Maintenance (for duration of project life)
 - (4) Hour meter (if none existed on existing equipment)
- (D) The data logging cost of a retrofit-only project is not eligible.

- (E) Additional information on verified diesel retrofit systems may be found on ARB's website at <http://www.arb.ca.gov/diesel/verdev/verdev.htm>. Information on verified LSI retrofit systems may be found at: <http://www.arb.ca.gov/msprog/offroad/orspark/verdev.htm>.

4. Equipment Replacement

- (A) Equipment replacement projects are limited to mobile and portable equipment.
- (B) Equipment manufactured under the "Flexibility Provisions for Equipment Manufacturers" (Flex equipment), as detailed in CCR, title 13, section 2423(d) is eligible for funding as replacement equipment, provided the equipment meets the requirements of section D.1.(J) above.
 - (1) Eligible Flex equipment whose reference engine family is certified to an FEL is also subject to the provisions of Section D.1.(H) and (I).
 - (2) Flex equipment with an engine whose reference engine family meets a standard, Tier, or FEL less stringent than Tier 3 standard (or Tier 2 standard for engines less than 50 horsepower or greater than 750 horsepower), is ineligible for funding.
- (C) The replacement of two (or more) pieces of existing equipment with one piece of replacement equipment is eligible for funding. Each piece of existing and replacement equipment must comply with all of the appropriate criteria in this section. The replacement equipment must execute the same job as the existing pieces of equipment. For baseline emissions calculation, the annual emissions of the two pieces of existing equipment are summed. For the replacement equipment emissions calculation, the annual usage of the two pieces of existing equipment is summed for the replacement equipment usage. The horsepower rating for the replacement equipment must not be greater than 125 percent of the original manufacturer rated horsepower (baseline horsepower) for the lowest horsepower of the two existing equipment engines (unless the grantee pays for the horsepower upgrade as specified in Section D.1.(M)).
- (D) If air districts use equipment dealers in implementing the equipment replacement program, reimbursement cannot be issued until all necessary documentation is received and approved by the air district. Participants may purchase the replacement equipment from a private party, provided all required documentation is submitted and approved by the air district. This includes warranty requirements and all other equipment replacement requirements.
- (E) Existing Equipment Requirements:

- (1) Equipment Ownership: the applicant must have owned the existing equipment in California for the previous two years. The applicant must provide documentation of the following specific to the existing equipment (select one):
 - a. Bill of sale for the old existing equipment (preferred)
 - b. Tax depreciation logs
 - c. Property tax records
 - d. Equipment insurance records
 - e. Bank appraisals for equipment
 - f. Maintenance/service records
 - g. General ledgers
 - h. Fuel records specific to the existing equipment that identify the equipment owner
 - i. Other documentation approved by ARB

- (2) Operational Requirements: the existing equipment must be in operational condition to qualify for funding. A pre-inspection of the existing equipment must be performed prior to funding to verify the operational status of the equipment. In addition, the applicant must provide documentation to demonstrate that the equipment was operational for the previous year. The following types of documents are acceptable:
 - a. Revenue and usage records that identify operational, standby, and down hours for the equipment
 - b. Routine inspections which document the operating condition of the existing equipment (Occupational Safety and Health Administration or workplace required)
 - c. Employee timesheets linked to specific equipment use
 - d. Preventative maintenance/service records tied to specific hours of equipment use
 - e. Repair work orders specific to the equipment
 - f. Other documents approved by ARB

- (3) Pre-Inspection Requirements: Pre-inspection must verify the operational condition of the existing equipment. The pre-inspection must verify, at a minimum, the following items:
- a. Tires in usable condition (able to hold air, sufficient tread or tracks, etc.)
 - b. Steering wheel operational
 - c. Equipment able to start up and move backwards and forwards
 - d. Buckets, blades, rollers, etc. are working
 - e. Undercarriage structurally sound
 - f. Fuel tank in usable condition
 - g. No parts stripped
 - h. Equipment not vandalized
 - i. Clear photographs of the existing equipment must include the following views listed below. The air district will specify the required digital format.
 - i. Right side - hood down
 - ii. Front - hood down
 - iii. Left side - hood down
 - iv. Equipment serial number
 - v. Engine serial number - either tag or stamp on block
 - vi. Diesel Off-Road Online Reporting System (DOORS) Equipment Identification Number (EIN), if applicable
 - vii. Rear
- (4) Destruction and Salvage Requirements: Equipment replacement requires that the existing equipment be scrapped to permanently remove it from service. This ensures that emission reductions are real and prevents the existing equipment from being moved into another locale to continue emitting high levels of pollutants.
- a. Destruction of the equipment may occur either at an air district approved salvage yard or another facility in conjunction with an air district salvage inspection.

- b. Both the existing engine and equipment must be destroyed. Refer to Section D.1.(P) for the engine destruction method. The destruction method of the equipment will vary depending on the structure of the equipment:
 - i. Equipment with permanent frame rails running the length of the equipment: complete cuts of both frame rails between the front and rear axles.
 - ii. Equipment with removable/bolt-on frame rails: structural damage, with cuts or otherwise, that renders the main body of the equipment inoperable and unrepairable.
 - iii. Equipment without frame rails: structural damage, with cuts or otherwise, that renders the main body of the equipment inoperable and unrepairable.
 - iv. Articulated equipment: damage, cuts or otherwise, to the articulation joints of front and rear halves of the equipment so that neither half can be joined.
 - v. Other equivalent methods of destruction are acceptable if approved by the air district.
- c. The existing engine and equipment must be destroyed within 60 days of being replaced. Documentation of the destruction must be provided to the air district within 10 days of destruction.
- d. Funding is not available for the salvage of any existing equipment.
- e. The existing equipment salvage value will be negotiated between either the applicant, the dealership, and/or the salvage yard.
- f. A salvage inspection of the existing equipment must be performed by either the air district or a contracted salvage yard.
- g. Air districts which perform their own salvage inspections must be notified within 10 days of destruction so that a salvage inspection can occur.
- h. Salvage inspection must include clear photographs of the following views:
 - i. DOORS EIN (if applicable)
 - ii. Equipment serial number

- iii. Engine serial number either stamped on the block or on the tag
 - iv. Destroyed engine block as described in Section D.1.(P).
 - v. Cut structural components as described in Section D.4.(E)(4)b.
 - vi. Other views dependent on the method of equipment destruction
- i. Salvage inspection of the existing equipment must be completed prior to disbursement of funds.

(F) Replacement Equipment Requirements

- (1) The replacement equipment must serve the same function and perform the same work equivalent as the existing equipment (e.g., replacement of an agricultural tractor with another agricultural tractor).
- (2) Only items essential to the operation of the equipment and the minimum attachments normally sold with the original equipment, as determined by the air district, are eligible for reimbursement on the replacement equipment. Equipment owners may remove non-emission related body components and place them on the replacement equipment as long as the components do not exist on the replacement equipment and are not part of the paid components for the replacement equipment.
- (3) Applicants may purchase the replacement equipment from a private party, provided all required documentation is submitted and approved. This includes warranty requirements and all other equipment replacement requirements.
- (4) If an applicant elects to install a retrofit with the replacement equipment, then the retrofit must be installed prior to equipment delivery to the grantee and must stay in operation on the replacement equipment for the project life. The retrofit must meet all the requirements per Section D.3.
- (5) Warranty Requirements
 - a. All new or used replacement equipment must have a minimum one-year or 1600-hour powertrain warranty. The warranty must cover parts and labor. A separate supplemental minimum one-year or 1600-hour power and drivetrain warranty must be

purchased if the equipment does not have one. The supplemental warranty costs are not eligible for funding.

- b. It is recommended that the highest grade warranty be purchased in order to avoid expensive repairs in the future.
- c. Warranty documentation must be provided to the air district.

(6) Post-Inspection Requirements

- a. Post-inspection of the replacement equipment must be completed prior to disbursement of funds.
- b. The post-inspection must include clear photographs of the following views:
 - i. Pictures(s) of full equipment
 - ii. Equipment serial number
 - iii. Engine serial number and engine information
 - iv. Retrofit (if available)
 - v. Hour meter reading

(G) Air District Requirements

- (1) Air districts must establish an off-road equipment replacement plan before funding projects. The plan must include criteria for the following:
 - a. Development of grantee contracts which must include a generic statement of work
 - b. Inspections (pre-, post-, salvage). The required digital format for the inspections photographs must be specified.
 - c. Reimbursement procedures
 - d. Monitoring and enforcement considerations
 - e. If applicable, for air districts that contract with dealers and salvage yards, the off-road equipment replacement plan must identify the air district's requirements for dealer and/or salvage yard contracts, and the process for oversight and review of program requirements that are expected of each entity, and the repercussions for non-compliance with the terms of the contract

for each entity. For air districts that contract with dealer(s), liaison training must be provided to the dealership staff.

- (2) Air districts may fund equipment replacement projects through a regional program administered by a designated air district. The designated air district could be either an air district located within the regional program or a large air district located outside of the regional program. A regional equipment replacement implementation plan must be established, containing all the required components as required in an individual air district's equipment replacement implementation plan. A regional equipment replacement plan must also contain a detailed description of the funding mechanism among the participating air districts. All air districts participating in the regional program must sign the regional equipment replacement implementation plan and must adhere to all the requirements specified in such regional implementation plan.
- (3) Air districts are encouraged, but are not required to establish contracts with dealers and salvage yards for participation in the program.
- (4) Air districts must ensure the following are performed:
 - a. Pre-inspection of the existing equipment. This may be performed by an air district approved dealer.
 - b. Verification that the replacement equipment proof of sale and if applicable, proof of financing have been received from the dealer or participant.
 - c. Post-inspection of the replacement equipment. This may be performed by an air district approved dealer.
 - d. Salvage inspection of the existing equipment. This may be performed by an approved salvage yard.
 - e. Verification that all post-inspection of replacement equipment and salvage inspection of existing equipment were completed and all documentation is submitted and approved prior to disbursement of funds.
- (5) The air district is allowed to make full payment to the dealer at the time the dealer delivers the replacement equipment to the applicant under the following framework:
 - a. The air district must complete the pre-inspection of the existing equipment and post-inspection of the replacement equipment to

make sure that all equipment complies with program requirements.

- b. The air district must sign a contract with the dealer and the salvage yard that contains, at a minimum, the program requirements that are expected of each entity and the repercussions for non-compliance with the terms of the contract for each entity. This shall include, but is not limited to, the requirement that the dealer delivers the existing equipment to a qualified salvage yard within 30 days of the date that the existing equipment was turned in to the dealer by the applicant.
- c. The air district must ensure the equipment is scrapped within 60 days of the salvage yard's receipt of the equipment through salvage inspection with the salvage yard to properly document the destruction of the existing equipment in accordance with the Moyer Program equipment replacement program requirements.

(H) Dealer Requirements

- (1) Equipment dealers that enter into a contract with an air district must:
 - a. Provide basic information to potential applicants about the equipment replacement category. Air districts must also provide liaison training to dealership staff.
 - b. Inform potential applicants of rights and responsibilities as outlined in the air district and ARB guidelines.
 - c. Help the potential applicants correctly complete the application. It is important that the participant understands the meaning of the program and the subsequent air district contract if approved for funding. The air district will provide all forms and certificates as appendices to the application.
 - d. Ensure that an application package is complete. The dealer must verify that all the following items are included in the application package:
 - i. A signed and complete application.
 - ii. All documentation as required in Sections D.4.(E)(1) and (2).
 - iii. The following information must also be included in the documentation:
 - (a) Make

- (b) Model
- (c) Model year
- (d) Equipment serial number
- (e) Engine make
- (f) Engine serial number
- (g) Expected delivery date of existing equipment

iv. Documentation of replacement equipment warranty.

e. Submit the completed application package to the air district.

(2) After the application and all required documentation have been approved by the air district, the dealer must provide the air district with proof of sale and if applicable, proof of financing of the replacement equipment. The financing package will enable the air district to determine the reimbursement costs that may be accrued in case the participant defaults on the contracted performance requirements. Proof of project financing can be a document showing the lender and the amount loaned, which at a minimum is a copy of the check given to the dealer equal to the portion of the project that was not Moyer Program funded. Proof of project financing is always required unless the grantee paid cash for the portion of the project that was not Moyer Program funded.

(3) Prior to releasing the replacement equipment to the participant, the dealer must have documentation of an air district pre-inspection of the existing equipment and the post-inspection of the replacement equipment. Alternatively, if approved by the air district to do pre- and post-inspections, the dealer must verify that photographs of the existing equipment and the replacement equipment, as defined in Sections D.4.(E)(3)i. and (F)(6)b., are clear prior to submitting them to the air district.

(4) Provide documentation certifying that the existing equipment will be received by a contracted salvage yard within 30 days.

(I) Salvage Yard Requirements

(1) Equipment salvage yards must enter into an agreement with the air district to qualify for participation.

(2) Contracted salvage yard(s) must:

- a. Destroy the existing equipment and engine within 60 days of receipt of the existing equipment in accordance with the program guidelines.
- b. Provide the air district with all photographs required under the air district's salvage inspections requirements per Section D.4.(E)(4)h. below within ten business days of salvaging the existing equipment.
- c. For each project, provide the following information:
 - i. Make
 - ii. Model
 - iii. Model year
 - iv. Serial number
 - v. Engine make
 - vi. Engine serial number
 - vii. Delivery date of the existing equipment
- d. Submit a completed certificate of equipment destruction or other similarly approved documentation to the air district.

E. Projects subject to the In-Use Off-Road Diesel-Fueled Fleets Regulation (Off-Road Regulation) (CCR, title 13, section 2449 et. seq.)

- 1. The existing equipment must be registered in DOORS.
- 2. Fleets must be in compliance with the regulation in order to be eligible for and receive funding. Fleets subject to the Off-Road Regulation that meet the final compliance requirements of the Off-Road Regulation are eligible for funding, and are exempt from the requirements of Section E.2.(E) through (I).
 - (A) Applicants must submit information regarding fleet size and compliance status. All documentation submitted must be signed and dated by the applicant and include language certifying that the fleet list provided is accurate and complete. Air districts are not required to validate submitted information and will not be held liable if fleet owners falsify fleet information. The following information shall be submitted at the time of application:
 - (1) DOORS ID of the fleet.
 - (2) DOORS EIN of the existing equipment.

- (3) Fleet size information (total horsepower) as reported to DOORS
- (4) Information to determine compliance with the Off-Road Regulation
 - a. Large fleets and medium fleets are required to show compliance with the Off-Road Regulation.
 - b. Prior to 1/1/2019, small fleets are not required to show compliance with the Off-Road Regulation.
- (5) For those fleets that have previously received Moyer Program funding, a list of funded equipment with the DOORS EIN of the funded equipment.
- (6) Large fleets must certify that they have not applied for Moyer Program funding for their off-road diesel fleet in another fiscal year (July 1-June 30) after January 1, 2017, excluding applications for which no funding was ultimately received.
- (B) Applicants must submit to the air district the DOORS EIN of the replacement equipment no later than at post-inspection of replacement equipment.
- (C) Applicants are not required to submit information on exempted equipment. Information on exempted off-road equipment can be found in the Off-Road Regulation.
- (D) No emission reductions achieved from a funded project can count towards a fleet's regulatory requirements for the duration of the contract term.
- (E) Eligibility for a project is based upon the Best Available Control Technology (BACT) requirements of the Off-Road Regulation.
 - (1) Any equipment funded through the Moyer program, and that is still under contract, must be deducted from the amount of equipment eligible for funding. For instance, a fleet that is eligible for funding to reduce emissions for 50 percent of its horsepower, but which has already received funding in previous years to reduce emissions from 20 percent of its horsepower, is only eligible for funding to reduce emissions from 30 percent of its horsepower.
 - (2) Equipment funded through the Moyer program must be included in the fleet's total horsepower from which the BACT requirements of the regulation are calculated.
- (F) Large Fleets

- (1) Eligible projects for large fleets, as defined in the Off-Road Regulation must provide at least three years emission reductions surplus to the regulation with a corresponding minimum project life of at least three years.
 - (2) Projects must be installed and in operation at least three years before the BACT requirements become effective for the funded equipment.
 - a. The first compliance date for large fleets, as defined in the Off-Road Regulation, is January 1, 2014. The final compliance date is January 1, 2023. Funding for these fleets is available through December 31, 2019.
 - b. Large fleets are eligible for funding once after January 1, 2017. After January 1, 2017, for those large fleets eligible for funding a second or subsequent time, only zero-emission projects are eligible.
 - c. Large fleets may have alternative requirements per Section E.2.(I) below.
- (G) Medium Fleets
- (1) Eligible projects for medium fleets, as defined in the Off-Road Regulation must provide at least three years emission reductions surplus to the regulation with a corresponding minimum project life of at least three years.
 - (2) Projects must be installed and in operation at least three years before the BACT requirements become effective for the funded equipment.
 - (3) The first compliance date for medium fleets, as defined in the Off-Road Regulation is January 1, 2017. The final compliance date is January 1, 2023. Funding for these fleets is available through December 31, 2019.
- (H) Small Fleets (includes Captive Attainment Area Fleets)
- (1) Eligible projects for small fleets, as defined in the Off-Road Regulation must provide at least two years emission reductions surplus to the regulation, with a corresponding minimum project life of at least two years.
 - (2) Projects must be installed and in operation at least two years before the BACT requirements become effective for the funded equipment.

- (3) The first compliance date for small fleets, as defined in the Off-Road Regulation is January 1, 2019. The final compliance date is January 1, 2028. Funding for these fleets is available through December 31, 2025.
- (l) Surplus Off-Road Opt-In for NOx (SOON) Program
 - (1) Fleets located in air districts that have opted into the SOON program and that are subject to the SOON provisions are eligible for funding in accordance with the Off-Road Regulation (CCR, title 13, section 2449.2) and must meet the applicable criteria in Sections A. through D. in this chapter.
 - (2) Projects funded under SOON, are not subject to Section E above, except for the requirements of Sections E.1., E.2.(A) through (C), and E.2.(l).
3. For more information on eligibility of off-road diesel equipment, please see the Regulation for In Use Off-Road Diesel-Fueled Fleets Carl Moyer Program Implementation Chart available at <http://www.arb.ca.gov/msprog/moyer/guidelines/supplemental-docs.htm>.

F. Projects subject to the Regulation for Cargo Handling Equipment at Ports and Intermodal Rail Yards (CHE Regulation) (CCR, title 13, section 2479)

1. Eligible Engines

- (A) For repower or replacement projects in which the equipment is subject to the CHE Regulation, only Tier 4 Final engines or cleaner are eligible for funding.
- (B) Replacement engines participating in the averaging, banking and trading program that are certified to FEL higher than the applicable emission standards, as designated on the Executive Order, are not eligible for funding.

2. Eligible projects must provide at least three years of emission reductions surplus to the regulation, with a corresponding minimum project life of at least three years. Cargo handling fleets that have met the final compliance requirements of the CHE Regulation are eligible for funding.

G. Projects subject to the Large Spark Ignition Engine Fleet Requirements (LSI Fleet Regulation) (CCR, title 13, section 2775 et. seq.)

1. Eligible funding must provide at least three years of emission reductions surplus to the LSI Fleet Regulation, with a corresponding minimum project life of at least three years.

2. Large and Medium Forklift Fleets and Fleets of Four or More Sweeper/Scrubbers, Ground Support Equipment, and/or Industrial Tow Tractors: In order to be eligible for funding, large and medium forklift fleets and fleets of four or more non-forklift LSI equipment must meet the final fleet average emission level applicable on January 1, 2013.
3. Agricultural Crop Preparation Forklift Fleets Model Year 1990 and Newer: These fleets are required to either retrofit, repower, or replace 100 percent of their fleet by January 1, 2012, or currently meet a 3.0 g/bhp hr fleet average HC + NOx level. Fleets that have met the 3.0 g/bhp-hr fleet average can apply for funding. Additionally, in accordance with SBx2 3 (H&SC § 44282.5(a)), fleets that have retrofitted/repowered 20 percent of their fleet in compliance with the regulation are eligible for funding up to the final compliance date. In order to be eligible, these projects must be under executed contract and must be installed and in operation prior to the applicable compliance date.
4. LSI fleets that have met the final compliance requirements of the LSI Fleet Regulation are eligible for funding. Due to the regulatory requirements for rental and lease equipment subject to the LSI Fleet Regulation, projects that include rented or leased equipment are not eligible.
5. Fleets with equipment not subject to the LSI Fleet Regulation are eligible for funding, including:
 - (A) Agricultural crop preparation non-forklift equipment and pre-1990 forklifts.
 - (B) Forklifts used exclusively in fields to harvest and maintain crops.
 - (C) Non-forklift LSI equipment such as aerial lifts, lawn and garden tractors, commercial turf equipment, mining and construction equipment, and industrial equipment.
 - (D) Small fleets (one to three forklifts and/or one to three sweepers/scrubbers, industrial tow tractors, or pieces of airport ground support equipment (airport GSE)).
6. Required Off-Road LSI Fleet Information: For forklifts, sweeper/scrubbers, airport GSE, and/or industrial tow tractors, an applicant's fleet size impacts project eligibility. Applicants must submit information regarding fleet size and compliance status. All documentation submitted must be signed and dated by the applicant and include language certifying that the fleet list provided is accurate and complete. Air districts are not required to validate submitted information and will not be held liable if fleet owners falsify fleet information.
 - (A) Large/Medium/Non-Forklift Fleets: For large, medium, and non-forklift fleets subject to the LSI Fleet Regulation, applicants are required to report compliance records for the entire statewide fleet as described in the regulatory language (CCR, title 13, section 2775.2).

- (1) DOORS ID of the fleet.
 - (2) DOORS EIN of the existing equipment.
 - (3) Fleet size information (total number of forklifts; total number of non-forklift LSI equipment).
 - (4) Information to determine compliance with the LSI fleet Regulation. Large and medium fleets are required to show compliance with the applicable final fleet average emission level.
- (B) Small Fleets: Small fleets are not required to maintain compliance records, but for the purposes of determining project eligibility, air districts must obtain the following information for the entire statewide fleet:
- (1) Equipment identification number (equipment identification number, fleet assigned identification, etc.)
 - (2) Equipment type (e.g., forklift, GSE, etc.)

7. If applicable, applicants must submit to the air district the DOORS EIN of the replacement equipment not later than at post-inspection of the replacement equipment.

8. Applicants are not required to submit information on exempted equipment (except as noted above for small fleets). Information on exempted LSI equipment can be found in CCR, title 13, sections 2775(b), 2775.1(c) (4), and 2775.1(d-f) of the Final Regulation Order (<http://www.arb.ca.gov/regact/lore2006/oalapprovedfro.pdf>).

H. Projects subject to the Airborne Toxic Control Measure for Diesel Particulate Matter from Portable Engines Rated at 50 Horsepower and Greater (Portable Engine ATCM) (CCR, title 17, section 93116 et. seq.)

1. In order to be eligible for repower projects, diesel engines regulated under the Portable Engine ATCM must be permitted or registered in an air district or registered in the Portable Equipment Registration Program. If the portable engine is not required to be permitted or registered, documentation must be included in the project file from the air district stating that a permit or registration is not required to operate in the air district.

2. In order to be eligible for funding, fleets must be fully compliant with the regulatory requirements in effect in 2020.

3. For more information on eligibility of engines used in portable equipment, please see the Portable Engine Airborne Toxic Control Measure Implementation Chart available at: <http://www.arb.ca.gov/msprog/moyer/guidelines/supplemental-docs.htm>.

I. Projects subject to the Regulation to Reduce Emissions of Diesel Particulate Matter, Oxides of Nitrogen and Other Criteria Pollutants from In-Use Heavy-Duty Diesel-Fueled Vehicles (Statewide Truck and Bus Regulation) (CCR, title 13, section 2025)

This regulation impacts the eligibility of all on-road heavy-duty diesel-fueled and alternative diesel-fueled vehicles operated in California with a manufacturer's GVWR greater than 14,000 pounds. Although this regulation primarily affects vehicles with on-road engines, some vehicles with off-road engines are also covered. Any application for Moyer Program funding to replace a vehicle with an off-road engine that is subject to an on-road regulation must comply with the applicable surplus requirements described in Chapter 4. For example, a yard truck with an off-road engine that is subject to the Statewide Truck and Bus Regulation (including yard trucks used primarily in agricultural operations) must meet the applicable on-road surplus requirements described in Chapter 4, Section C.2., and must also comply with all off-road project criteria described in this chapter.

APPENDIX B: DEFINITIONS

Acceleration Simulation Mode: A type of vehicle emissions test conducted with the test vehicle on a chassis dynamometer to simulate on-road acceleration operating conditions.

Administrative Funds: State funds allocated to program support and outreach costs directly associated with implementing the Moyer Program.

Agricultural Assistance Program: A program established by section 39011.5 of the Health and Safety Code (H&SC) providing funds for new purchase, retrofit, repower, or add-on for previously unregulated agricultural equipment.

Air district or District: An air pollution control district or an air quality management district.

Air Pollution Control Officer: The air pollution control officer, executive director, executive officer or designee as determined by each air district.

Airport Ground Support Equipment: Any engine- or motor-powered equipment used for service and support of aircraft operations. Airport ground support equipment (GSE) performs a variety of functions, including but not limited to: aircraft maintenance, pushing or towing aircraft, transporting cargo to and from aircraft, loading cargo, and baggage handling. GSE vehicles include equipment types such as baggage tugs, belt loaders, and cargo loaders.

Applicant Cost Share (ACS): The 15 percent or more of Moyer Eligible Cost (MEC) that is paid by the applicant, except when waived for public entity applicants.

Auxiliary Engine: An engine that is not the propulsion engine but for which the fuel, cooling, and/or exhaust systems are an integral part of the equipment or vehicle.

Auxiliary Power Unit: Any device that provides electrical, mechanical, or thermal energy to the primary diesel engine, truck cab, or sleeper berth as an alternative to idling the primary diesel engine.

Barge: A vessel having a flat-bottomed rectangular hull with sloping ends and built with or without a propulsion engine.

Baseline Technology: Engine technology applied under normal business practices, such as the existing engine in a vehicle or equipment for replacements, repowers, and retrofits.

California's Goods Movement Trade Corridor: The entirety of the South Coast Air Basin, San Joaquin Valley Air Basin, Sacramento Federal Ozone Nonattainment Area, San Francisco Bay Area Air Basin, San Diego County Air District, Imperial County Air District, and Port Hueneme.

Captive Attainment Area Fleet: A fleet or an identified subpart of the fleet (fleet portion, consistent with, California Code of Regulations, title 13, section 2449(d)) in which all of the vehicles in the fleet or fleet portion operate exclusively within the following counties: Alpine, Colusa, Del Norte, Glenn, Humboldt, Lake, Lassen, Mendocino, Modoc, Monterey, Plumas, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz, Shasta, Sierra, Siskiyou, Trinity, Tehama, and Yuba. A fleet or identified fleet portion that operates one or more vehicles outside the counties listed above is not a captive attainment area fleet.

Case-by-Case Determination: A process in which local air districts may request Moyer Program staff to review and approve a project that varies from the specific requirements of these Guidelines only if such approval will not adversely affect the achievement of real, surplus, quantifiable, enforceable and cost-effective emission reductions. See Chapter 3: Program Administration, Section U for additional information.

Certification: A finding by the Air Resources Board (ARB) or the U.S. EPA that a mobile source or emissions control device has satisfied applicable criteria for specified air contaminants.

Charter Fishing Vessel: A vessel for hire by the general public, dedicated to the search for and collection of fish for the purpose of general consumption.

Class 1 Freight Railroad: As defined by the Surface Transportation Board (see www.stb.dot.gov<<http://www.stb.dot.gov/>>). As of January 2017, Union Pacific Railroad (UP), Burlington Northern and Santa Fe Railroad (BNSF), and their subsidiaries are the only Class 1 freight railroads operating in California.

Class 2 Freight Railroad: As defined by the Surface Transportation Board (see www.stb.dot.gov<<http://www.stb.dot.gov/>>). As of January 2017, Arizona and California Railroad, Central Oregon and Pacific Railroad are the only Class 2 freight railroads operating in California.

Class 3 Freight Railroad: As defined by the Surface Transportation Board (see www.stb.dot.gov<<http://www.stb.dot.gov/>>). Short-line railroads and military and industrial railroads are generally considered Class 3 freight railroads for the purposes of eligibility.

Clean Air Reporting Log (CARL): An on-line database tool maintained by ARB and used by air districts to track and report projects and funds under the Moyer Program.

Commercial Fishing Vessel: A vessel dedicated to the search for and collection of fish to be sold at market or directly to a purchaser.

Commitment: Under Chapter 5, a program milestone in which Moyer Program funds have been designated or applied towards an eligible project approved by the air district board, district air pollution control officer, or other delegated authority.

Competitive Bidding Process: For Moyer Program purposes, the process by which an air district competitively selects publicly accessible infrastructure projects. The process, including selection criteria, must be outlined in the air district solicitation and approved by the air district board.

Conversion of Existing Station: Infrastructure projects in which an existing non-alternative fueling station (i.e. diesel) is converted to an alternative fueling station for hydrogen or natural gas.

Cost-effectiveness: A measure of the dollars provided to a project for each ton of covered emission reduction (H&SC § 44275(a)(4)).

Cost-effectiveness Limit: The maximum amount of funds the Moyer Program will pay per weighted ton of emission reductions, using the methodology in Appendix C.

Covered Emissions: Emissions of oxides of nitrogen, particular matter, and reactive organic gases from any covered source.

Covered Source: On-road vehicles, off-road non-recreational equipment and vehicles, locomotives, marine vessels, agricultural sources of air pollution as defined in Section 39011.5, and, as determined by the State Board, other categories necessary for the State and air districts to meet air quality goals (H&SC § 44275(a)(7)).

Crawler Tractor: A tracked off-road tractor equipped with a substantial metal plate, or blade, as opposed to a bucket on a loader. This equipment is commonly referred to as a track mounted bulldozer and is used to push large quantities of soil, sand, rubble, etc., during construction and mining work. The dozing power of the crawler tractor exceeds that of the rubber tired dozer. A ripper, which is a claw-like device, may be attached to the back of a larger dozer.

Crew and Supply Vessel: A self-propelled vessel used for carrying personnel and/or supplies to and from off-shore and in-harbor locations (including, but not limited to, off- shore work platforms, construction sites, and other vessels).

Deterioration: The increased exhaust emissions over time taking into account wear and tear on engines and emissions control devices.

Deterioration Life: A factor calculated from the period of time the engine has deteriorated, plus half the project life, used to estimate deterioration over the entire project life. $DL = \text{project starting year} - \text{engine model year} + (\text{project life} / 2)$.

Deterioration Product: The result of multiplying the deterioration rate, equipment activity, and the deterioration life for a technology.

Deterioration Rate (DR): Rates that estimate increased emissions of NO_x, ROG and PM from engine wear and tear and other variables that increase engine emissions over time. On-road deterioration rates are established by weight class and engine model year, based on values in ARB's on-road emission inventory model (EMFAC2014). Off

road deterioration rates are established by horsepower and either Tier or model year, based on values in ARB category specific inventory models.

DC fast charger: A unit for 200 - 480V Direct-Current (DC) charging up to 200 amps, using an off-board charger that connects directly to the vehicle's battery. Also called DC Level 1 and DC Level 2.

Dredge: A vessel designed to remove debris or earth from the bottom of waterways. Dredges may be built with or without a propulsion engine.

Electric Vehicle Supply Equipment (EVSE): An electrical energy transfer device that conducts and regulates power from the electrical portal connection to the electrical vehicle inlet.

Emission Control System: Any device, system, or element of design that controls or reduces the emissions of regulated pollutants from a vehicle.

Emission Factor (EF): A category specific estimate of emissions per unit of activity. On-road emission factors are based on ARB mobile source emission inventory model (EMFAC2014) values. Off-road emission factors are based on values applied in ARB category specific inventory models.

Enterprise Operator: A person who conducts a voluntary accelerated vehicle retirement enterprise according to the Voluntary Accelerated Vehicle Retirement Regulation (California Code of Regulations, title 13, § 2601 et seq.), purchases vehicles, arranges for a vehicle's permanent removal from operation, and receives any emission reduction credit generated.

Excavator: An engineering vehicle consisting of an upper carriage with hydraulically rotating upper deck (revolving 360°) and attachment, directly mounted to either a wheeled or crawler undercarriage. The front end of the excavator attachment consists either of a bucket, grapple, scrap shear, or another implement.

Excursion Vessel: A self-propelled vessel that transports passengers for purposes including, but not limited to: dinner cruises; harbor, lake, or river tours; scuba diving expeditions; and whale watching tours. Excursion vessels do not include crew and supply vessels, ferries, and recreational vessels.

Executed Contract: A legally binding contract signed by the local air district Air Pollution Control Officer, or other air district designated representative, and the grantee to fund an eligible engine, equipment, or vehicle project that will reduce covered emissions. An executed contract is a program milestone in which parties agree to meet the obligations within the contract by a specified date.

Existing Lawn Mower: A gasoline-fueled, operational lawn mower owned and operated in California by the applicant.

Existing Station Upgrade: Improvements to a battery charging or alternative fueling station without increasing the output capacity.

Expansion to Existing Station: Infrastructure projects that increase the amount of fuel/energy throughput or capacity to fuel/charge equipment/vehicles at current alternative fueling and battery charging stations.

Expend: To make a full or partial payment of Moyer Program funds toward a project invoice for an eligible Moyer Program project.

Farm Equipment: As applied to off-road engines, includes equipment used in agricultural operations as defined in the Regulation for In-Use Off-Road Diesel-Fueled Fleets (California Code of Regulations, title 13, § 2449(c)(1)). As applied to portable and stationary engines, includes the agricultural sources defined in Health and Safety Code section 39011.5.

Federal Funds: Awards of financial assistance to an individual or organization from the U.S. government to carry out a government-authorized purpose, and not provided as personal benefits or assistance from the government.

Family Emission Limit (FEL): An emission level declared by the manufacturer to serve in place of an otherwise applicable emission standard under a federal or State averaging, banking, and trading program.

Ferry: Any self-propelled vessel or boat or owned, controlled, operated, or managed for public use in transportation of carrying passengers, property or vehicles on scheduled services.

Fleet Average Emission Level: The arithmetic mean of the combined hydrocarbon plus oxides of nitrogen emissions for each piece of applicable large spark-ignition engine powered equipment comprising an operator's fleet. For full definition, see California Code of Regulations, title 13, section 2775.

Forklift: Electric Class 1 or 2 rider trucks or large spark-ignition engine powered Class 4, 5 or 6 rider trucks as defined by the Industrial Truck Association. Electric Class 3 trucks are not forklifts for the purposes of these Guidelines. More information can be found at <http://www.osha.gov/dcsp/products/etools/pit/forklift/types/classes.html> and <http://www.indtrk.org>.

Freight Locomotive: A locomotive that hauls freight as its primary function.

Funding Amount: The amount of funds dedicated to a contracted project for reporting purposes in CARL; this value may never exceed the grant amount.

Funding Cap: The maximum dollar amount or maximum percentage of Moyer or State funds that may be expended on a project, as specified by source category and limited by variables that include the contribution of other incentive programs, rules, regulations, and incremental cost.

Funding Target: The total funds required to meet a program milestone such as funds executed or liquidated during a funding cycle, for purposes of cumulative tracking and reporting. Funding targets consider regular Moyer Program funds, State Reserve funds, Rural District Assistance Program funds, Moyer voucher program funds, required match funds, interest funds, reallocated funds, recaptured funds, interest and salvage revenues, and other funds associated with the Moyer Program.

Funding Year: The designation given to each year that air districts are awarded Moyer Program funds. Moyer Program grant awards were first made in fiscal year 1998 to 1999; therefore, that year is designated as Year 1; fiscal year 1999 to 2000 is Year 2, etc. Each funding year is associated with set times for achieving program milestones such as contract execution, fund expenditure, and fund liquidation.

Funding Year Adjustment: An addition or subtraction to an air district's project and/or administrative fund amounts in one funding year to account for changes (e.g., recaptured funds, errors) in liquidated funds in an earlier funding year.

Grant Amount: Contracted amount of Moyer funds for a project, which may not exceed the maximum dollar amount or maximum percentage of eligible cost specified by source category and project type.

Glider Kit: A replacement chassis and cab for on-road heavy-duty vehicles. Glider kits are identified with a vehicle identification number starting with the letters "GL".

Gross Vehicle Weight Rating (GVWR): A value specified by the vehicle manufacturer as the maximum design loaded weight of a single vehicle. Examples are shown in Table B-1.

Harbor Craft: (also called "Commercial Harbor Craft") Any private, commercial, government, or military marine vessel including, but not limited to, passenger ferries, excursion vessels, tugboats, ocean-going tugboats, towboats, push-boats, crew and supply vessels, work boats, pilot vessels, supply boats, fishing vessels, research vessels, United States Coast Guard vessels, hovercraft, emergency response harbor craft, and barge vessels that do not otherwise meet the definition of ocean-going vessels or recreational vessels.

Head End Power Unit: Most passenger locomotives are equipped with head end power (HEP) or hotel power, an onboard generator typically about a 500 horsepower that provides power to the passenger cars of the train for such functions as heating, lighting and air conditioning.

Heavy-Duty Vehicles (HDV): Trucks and buses in the weight classes shown in Table B-1.

**Table B-1
Heavy-Duty Vehicle Classification for Moyer Program On-Road Projects**

Vehicle Classification	GVWR
Light Heavy-Duty (LHD)	14,001 to 19,500 pounds
Medium Heavy-Duty (MHD)	19,501 to 33,000 pounds
Heavy Heavy-Duty (HHD)	Over 33,000 pounds

Home Port: The port in which a vessel is registered or permanently based.

Incremental Cost: The cost of the project less a baseline cost that would otherwise be incurred by the applicant in the normal course of business. Incremental costs may include added lease, energy, or fuel costs pursuant to Health and Safety Code section 44283 as well as incremental capital costs.

Interest Revenue: Interest generated from Moyer Program funds held by an air district in interest-bearing accounts. Interest earned on Moyer Program funds becomes Moyer Program funds.

Industrial Tow Tractor: An electric or large spark-ignition engine-powered Class 6 truck as defined by the Industrial Truck Association. They are designed primarily to push or pull non-powered trucks, trailers, or other mobile loads.

Investor Owned Utility: A business providing utility services such as electricity, natural gas, telephone and water services, that is managed privately rather than as a function of a government or public cooperative. Examples are Pacific Gas and Electric, Southern California Edison, and Sempra Energy.

Large Fleet: Under the In-Use Off-Road Diesel-Fueled Fleets Regulation, a fleet with a total maximum power greater than 5,000 horsepower. A fleet must meet large fleet requirements of this regulation if the total vehicles under common ownership or control would be defined as a large fleet. All fleets owned by the United States, the State of California, or agencies thereof (i.e., an agency in the judicial, legislative, or executive branch of the federal or state government) are considered as a unit whole and must meet the large fleet requirements of the In-Use Off-Road Diesel-Fueled Fleets Regulation (California Code of Regulations, title 13, § 2449). Under the Large Spark Ignition Engine Fleet Requirements Regulation, a large fleet is an operator's aggregated operations in California of 26 or more pieces of large spark-ignition equipment.

Lawn and Garden Equipment: Equipment used to maintain lawns and gardens. This equipment is generally, but not exclusively, powered by spark-ignition engines. This equipment is traditionally used in applications such as lawn mowers, edger's, trimmers, leaf blowers, and chainsaws. Equipment that does not fall into this category includes golf carts, specialty vehicles, generators, pumps, and other small utility equipment.

Lawn Mower Exchange Event: An occasion where participants' existing gasoline lawn mowers are exchanged for new cordless, zero-emission electric lawn mowers or vouchers for new, cordless, zero-emission electric lawn mowers.

Level 2: Electric vehicle supply equipment for connection to an on-board vehicle charging system, with 208V–240V alternating-current (AC) charging up to 80 amps.

Line-Haul Locomotive: A locomotive powered by an engine or engines typically totaling 4,000 or more horsepower that transports goods between major urban centers.

Liquidate: To spend all moneys for a specified fiscal year to reimburse grantees for valid and eligible project invoices and air district administrative costs. Payments withheld from the grantee by an air district until all contractual reporting requirements are met may be excluded from these amounts for the purposes of liquidation.(H&SC § 44275(a)(12)). For a specific project, liquidation refers to all funded equipment as paid in full and operational.

Local Funds: Monies provided by any unit of local government including a publicly owned utility and Joint Powers Authority (JPA).

Match Funds: Funds under an air district's budget authority that will be applied towards eligible Moyer Program projects in accordance with the matching requirements of the program. See Health and Safety Code section 44287(e) and 44287.2(c).

Maximum Dollar Amount: The maximum amount of funds that may be expended on a project as specified by source category and project type, often to reflect incremental cost.

Maximum Grant Amount: The maximum amount of money a grantee is eligible to receive for a cost-effective Moyer Program project. The maximum grant amount for a project is the lowest of the three following values: (a) the grant amount at the cost-effectiveness limit; (b) the maximum percentage of eligible cost; or (c) any maximum dollar amount specified in the relevant source category chapter.

Maximum Percentage: The maximum percentage of eligible cost that may be expended on a project as specified by source category and project type, often to reflect incremental cost.

Medium Fleet. Under the In-Use Off-Road Diesel-Fueled Fleets Regulation, a fleet with total minimum power of greater than 2,500 horsepower and with a total maximum power less than or equal to 5,000 horsepower. Under the Large Spark Ignition Engine Fleet Requirements Regulation, an operator's aggregated operations in California of 4 to 25 pieces of large spark-ignition equipment.

Memorandum of Agreement (MOA) or Memorandum of Understanding (MOU): A document recording the basic terms of a proposed transaction or setting forth the principles and guidelines under which parties will work together.

Mitigation Funds: Monies received for the compensation for the impacts to the environment from a proposed activity.

Mobile Cargo Handling Equipment: Any motorized vehicle used to handle cargo delivered by ship, train, or truck such as yard trucks, rubber tired gantry cranes, top picks, dozers, and excavators.

Moyer Eligible Cost: Costs associated with projects that are eligible for reimbursement under the Moyer Program, prior to considering the cost-effectiveness limit or any project funding cap restrictions. This includes the sum of Moyer Paid Cost and Remaining Eligible Cost.

Moyer Ineligible Cost: Costs associated with a project that are not eligible under the Moyer Program guidelines, but are eligible project costs under other funding sources.

Moyer Paid Cost: Project costs eligible under the Moyer Program, and are to be paid by the Moyer Program. These costs are used to determine project cost-effectiveness, except in the case of infrastructure projects.

Moyer Program Funds: State funds awarded by ARB to local air districts to implement the Moyer Program, including project and administrative, and interest revenue from the awarded funds, and revenues from salvage of equipment scrapped under the program. Local funds that are under the air district's budget authority may also qualify as Moyer Program funds or match funds (see H&SC § 44287(e)); however, certain limitations apply (see H&SC § 44287(j)).

Nationally Recognized Testing Laboratory: Is a private-sector organization that OSHA has recognized as meeting the legal requirements in 29 CFR 1910.7 to perform testing and certification of products using consensus based test standards.

New Station: Construction of a new battery charging or alternative fueling station where there is currently no station.

Non-forklift fleet: Under the Large Spark Ignition Engine Fleet Requirements Regulation, an operator's aggregated operations in California of four or more sweeper/scrubbers, industrial tow tractors, or pieces of airport ground support equipment, alone or in combination.

Non-Moyer Funds: Project funds from sources other than the Moyer Program, Moyer match funds, and AB 923 \$2 DMV fees.

Off-Highway Tractors: Equipment that feature yoke hitches that oscillate four ways to reduce frame stresses. Rugged turn stops prevent excessive wagon rotation in either direction. The rear platform functions as a power train guard providing a safe, stable work area. (These are not off-highway trucks (e.g. articulated trucks or rigid haul trucks) which are bulk-handling machines, such as earthmovers or dump trucks, designed to operate on steep or rough terrain and not designed to drive on-highway.)

Off-Road Compression-Ignition Equipment: A piece of equipment that is powered by an off-road compression-ignition engine which is any internal combustion engine: in or on a piece of equipment that is self-propelled or serves as a dual purpose by both propelling itself and performing another function and is primarily used off the highways (such as garden tractors, off-highway mobile cranes and bulldozers); or in or on a piece of equipment that is intended to be propelled while performing its function (such as lawnmowers and string trimmers); or that, by itself or in or on a piece of equipment, is portable or transportable, meaning designed to be and capable of being carried or moved from one location to another. Indicia of transportability include, but are not limited to wheels, skids, carrying handles, dolly, trailer, or platform that is consistent with California Code of Regulations, title 13 section 2421.

Off-Road Large Spark-Ignition Engine: any engine that produces a gross horsepower of 25 horsepower or greater (greater than 19 kilowatts for 2005 and later model years) or is designed (e.g., through fueling, engine calibrations, valve timing, engine speed modifications, etc.) to produce 25 horsepower or greater (greater than 19 kilowatts for 2005 and later model years) used to propel an off-road piece of equipment. The engine may be designed to use gasoline fuel, liquid petroleum gas, compressed natural gas, methanol fuel, or a combination of these.

Off-Road Large Spark-Ignition Equipment: Equipment that cannot be registered and driven safely on-road or was not designed to be driven on-road. Newer equipment uses engines certified to the off-road spark ignition engine standards. These engines may be designed to use gasoline fuel, liquid petroleum gas (LPG), compressed natural gas, methanol fuel or a combination of these and are most commonly found in forklifts.

Other Applied Funds: Funds that are not local, State, or federal that are used to co-fund a Moyer eligible project.

Operator: A person, corporation, public agency, or other entity that owns, operates or maintains a vehicle, equipment, or installation.

Passenger Locomotive: A locomotive that hauls passengers as its primary function.

Penalty Funds: Funds paid to an enforcing entity as a result of enforcement action brought against a violator of a local, State or federal law, ordinance, regulation or rule.

Pilot Vessel: A vessel designed for, but not limited to, the transfer and transport of maritime pilots to and from oceangoing vessels while such vessels are underway.

Policies and Procedures: An air district manual for local implementation of the Moyer Program. For more information see Chapter 3, Section C.

Power Take-Off (PTO): A secondary engine shaft (or equivalent) that provides substantial auxiliary power for purposes unrelated to vehicle propulsion or normal vehicle accessories such as air conditioning, power steering, and basic electrical accessories. A typical PTO uses a secondary shaft on the engine to transmit power to a hydraulic pump that powers auxiliary equipment.

Program Milestone: A measure of progress toward meeting Moyer Program grant terms or statutory requirements. Examples are contract execution, liquidation and (in Chapter 5) commitment.

Project Life: The period for which the Moyer Program funds surplus emission reductions for a given project.

Project Funds: Moyer Program funds designated for eligible project costs to reduce covered emissions from covered sources.

Propulsion Engine: A marine engine that generates the power to propel a vessel through the water.

Publicly Accessible: An infrastructure project that is available to provide fuel or energy to all members of the general public with no physical access restrictions and no necessity to enter into a contract or sign release of liability.

Public Entity: The State of California, a public university or college, a county, city, district, public authority, public agency, public corporation, another state government, the federal government, or any other subdivision or agency of a state government or the federal government.

Public Fleets: Heavy-duty on-road diesel-fueled vehicles operated by a municipality. A municipality is a city, county, city and county, special district, or a public agency of the State of California, and any department, division, public corporation, or public agency of this State, or two or more entities acting jointly, or the duly constituted body of an Indian reservation or Rancheria.

Public Funds: Funds provided toward project costs by local, State or federal public entities, including grants, rebates and vouchers.

Rail equipment: Non-locomotive equipment designed for use on tracks, such as on-rail vehicles, railcar movers, sweepers, and wheel cranes that have tires or mounted tracks. Equipment that replaces switcher locomotives are considered locomotives for the purposes of the Moyer Program.

Reallocation: A process for allocating mitigation funds and/or returned funds to eligible air districts. See Chapter 3, Section P for additional information.

Rebuilt or Remanufactured: Engines offered by the original engine manufacturer (OEM) or by a non-OEM rebuilder who demonstrates to ARB that the rebuilt engine and parts are functionally equivalent from an emissions and durability standpoint to the OEM engine and components being replaced.

Recaptured Funds: Project funds that are returned by a grantee to an air district or ARB because that grantee did not meet all of its contractual obligations. Air districts must spend these funds on another project in a later funding year.

Reduced Technology: Newer technology that is used by the applicant to obtain surplus emission reductions.

Remaining Eligible Cost: Project costs that are eligible under the Moyer Program but are to be paid by other sources of funding. Remaining eligible costs exist when the Moyer Paid Cost and Applicant Cost Share provide less than 100 percent of the Moyer Eligible Cost.

Remotely Located: Agricultural engines located in a federal ambient air quality area that is designated as unclassifiable or attainment for all PM and ozone national ambient air quality standards and that are located more than one-half mile from any residential area, school, or hospital.

Replacement Lawn Mower: A cordless, zero-emission electric lawn mower.

Repower: A repower is the replacement of the existing engine with an electric motor or a newer emission-certified engine instead of rebuilding the existing engine to its original specifications.

Retrofit: Modifications to the engine and fuel system so that the retrofitted engine does not have the same emissions specifications as the original engine, or the process of installing an ARB-verified emissions control system on an existing engine.

Returned Funds: Funds returned by an air district to ARB for reallocation because they are either not liquidated by the required funding year liquidation deadline, or are associated with an ARB Incentive Program Review mitigation measure.

Rough Terrain Forklift: Class 7 forklifts powered by compression ignition engines and having pneumatic tires that handle uneven surfaces. This includes both straight-mast forklifts and extended-reach forklifts, also called telescopic forklifts or tele-handlers.

Rubber Tired Dozer: A wheeled off-road tractor equipped with a substantial metal plate, or blade as opposed to a bucket on a loader. This equipment is commonly referred to as a rubber tired bulldozer and is used to push large quantities of soil, sand, rubble or other materials during construction and mining work where the traction of a crawler tractor is not required. A ripper, which is a claw-like device, may be attached to the back of a larger dozer.

Rural District Assistance Program: An element of the Moyer Program in which air districts pool their project funds to streamline project outreach, solicitation, and review.

School Bus: Vehicles used for the express purpose of transporting students, kindergarten through grade 12, from home to school, school to home, and to any school sponsored activities.

Shore Power: Electrical power being provided to the ship at berth by either the local utility or by distributed generation.

Skid Steer Loader: A very compact and maneuverable off-road tractor that uses a bucket on the end of movable arms to lift materials and move material such as dirt, debris, building materials, bulk goods, heavy objects, or snow removal. Unlike conventional loaders, the lift arms are alongside the driver with the pivot points behind the driver's shoulders. Skid steer loaders are used in tight spaces and can be equipped with a variety of attachments, such as a hammer, augur, trencher, forklift and other attachments (never greater than 120 horsepower (hp), predominantly 40-75 hp. Skid Steer loaders are often utilized to excavate swimming pools and in landscaping residential backyards.

Small Fleet: In the on-road sector, a fleet size of three or fewer vehicles as defined in the California Code of Regulations, title 13, section 2025(d)(31)(G). Under the In-Use Off-Road Diesel-Fueled Fleets Regulation, a fleet with a total maximum power of less than or equal to 2,500 horsepower that is owned by a business, non-profit organization, or local municipality; or a local municipality fleet in a low population county irrespective of total maximum power; or a non-profit training center irrespective of total maximum power. Under the Large Spark Ignition Engine Fleet Requirements Regulation, an operator's aggregated operations in California of 1 to 3 forklifts and/or 1 to 3 pieces of non-forklift equipment.

Smog Check: the motor vehicle inspection and maintenance program established by California Health and Safety Code Section 44000, et seq.

Solid Waste Collection Vehicle (SWCV): Diesel-fueled vehicles greater than 14,000 pounds GVWR with model year 1960 through 2006 engines used to collect residential and commercial solid waste.

Spark Ignition: A gasoline-fueled engine or any other type of engine with a spark plug (or other sparking device) and with operating characteristics significantly similar to a combustion cycle.

State Funds: Funds provided by a State agency for the purpose of co-funding projects under the Moyer Program. State agencies include every State office, department, division, bureau, board, commission, the University of California, and the California State University.

State Implementation Plan: Under the Clean Air Act, the plan submitted by a state that demonstrates attainment or maintenance of an air quality standard through implementation of specified control measures.

Supplemental Environmental Project: An environmentally beneficial project that a violator subject to an enforcement action voluntarily agrees to undertake in a settlement action to offset a portion of an administrative or civil penalty.

Sweeper/scrubber: A large spark-ignition engine-powered piece of industrial floor cleaning equipment designed to brush and vacuum up small debris and litter and then scrub and squeegee the floor.

Switch Locomotive: A locomotive powered by an engine or engines typically totaling less than 2,300 total horsepower, and used to separate and move railcars from track to track or transfer cars to and from regional carriers. All Class 3 railroad locomotives – including all short-line and military and industrial locomotives – are considered switch locomotives for the purposes of the Moyer Program eligibility.

Total Project Cost: The Moyer Eligible Cost and the Moyer Ineligible Cost for vehicles, equipment, engines, accessories, installation and infrastructure within a single Moyer Program project. An applicant may not accept grant funds from all sources that exceed 100 percent of total project cost excluding the Applicant Cost-Share.

Tow Boat: Any self-propelled vessel engaged in or intending to engage in the service of pulling, pushing, or hauling alongside barges or other vessels, or any combination of pulling, pushing, or hauling alongside barges or other vessels.

Transit Fleet Vehicle: On-road vehicles operated by a public transit agency, less than 35 feet in length and 33,000 GVWR, but greater than 8,500 GVWR, powered by heavy-duty engines fueled by diesel or alternative fuel; including service vehicles, tow trucks, dial-a-ride buses, paratransit buses, charter buses, and commuter service buses operated during peak commute hours with ten or fewer stops per day.

Transport Refrigeration Unit (TRU): A refrigeration system powered by an internal combustion engine designed to control the environment of temperature sensitive products transported in trucks and refrigerated trailers. TRUs may be capable of both cooling and heating.

Truck Stop Electrification: The installation at a truck stop of electric power infrastructure and/or external systems that provide heating, cooling, and other energy needs for trucks.

Tug Boat: Any self-propelled vessel engaged in, or intending to engage in, the service of pulling, pushing, maneuvering, berthing, or hauling alongside other vessels, or any combination of pulling, pushing, maneuvering, berthing or hauling alongside such vessels in harbors, over the open seas, or through rivers and canals. Tug boats generally can be divided into three groups: harbor or short-haul tugboats, ocean-going or long-haul tugboats, and barge tugboats. “Tug boat” is interchangeable with “tow boat” and “push boat” when the vessel is used in conjunction with barges.

Tier 1, 2, and 3 Engines: Engines that are subject to California Code of Regulations, title 13, section 2423(b)(1)(A) and/or Code of Federal Regulations, title 40, part 89.112(a). This also includes engines certified under the averaging, banking, and trading program with respect to the Tier 1, 2, and 3 Family Emission Limits (FEL) listed in California Code of Regulations, title 13, section 2423(b)(2)(A) and/or Code of Federal Regulations, title 40, part 89.112(d).

Tier 4 Engine: Engines that are subject to interim or final after-treatment based Tier 4 emission standards in California Code of Regulations, title 13, section 2423(b)(1)(B) and/or Code of Federal Regulations, title 40, part 1039.101. This also includes engines

certified under the averaging, banking, and trading program with respect to the Tier 4 FEL listed in California Code of Regulations, title 13, section 2423(b)(2)(B) and/or Code of Federal Regulations, title 40, part 1039.101. For locomotives, the term refers to the Tier 4 (2015 engine model year) emission standards in the Code of Federal Regulations, title 40, Part 1033.

Uncontrolled Large Spark-Ignition Engines: Means pre-2001 uncertified engines and 2001-2003 certified “non-compliant” large spark-ignition engines.

Urban Bus: A passenger carrying vehicle owned or operated by a public transit agency, powered by a heavy heavy-duty engine, or of a type normally powered by a heavy heavy-duty engine, intended primarily for intra-city operation. The buses are generally greater than 35 feet, and or greater than 33,000 pounds gross vehicle weight rating.

Utility: A privately-owned company that provides the same or similar service for water, natural gas, and electricity as a public utility operated by a municipality.

Voluntary Accelerated Vehicle Retirement Enterprise (VAVR): a privately owned and/or operated business by an enterprise operator.

Verification: A determination by ARB or the U.S. EPA that a diesel emission control strategy meets specified requirements, based on both data submitted and engineering judgement.

Violator: An individual, company, or entity responsible for a violation of an environmental law, regulation or rule.

Voucher Incentive Program (VIP): An air district incentive program using Moyer Program funds to provide a streamlined approach to replace or retrofit older, high-polluting heavy-duty vehicles or equipment with cleaner-than -required vehicles or equipment providing early or extra emission reductions. Funds for VIP projects are used to reduce some of the costs associated with replacing or retrofitting a vehicle.

Workover Rig: Mobile self-propelled rigs used to perform one or more remedial operations on an existing well. The primary function of a workover rig is to act as a hoist so that pipe, sucker rods and down-hole equipment can be run into and out of a well. Operations include deepening, plugging back, or pulling and resetting liners, usually on a producing oil or gas well to try to restore or increase the well's production.

APPENDIX C: COST-EFFECTIVENESS CALCULATION METHODOLOGY

A. Introduction

Cost-effectiveness is the measure of dollars provided to a project for each ton of covered emissions reduced. Statute requires that the Air Resources Board (ARB) update the cost-effectiveness limit and capital recovery factors (CRF) annually. In addition, changes in statute per SB 513 now allow ARB, in consultation with air quality management districts and air pollution control districts (air districts), to establish new cost-effectiveness limits that reflect the cost of regulations and technology.

To determine a project's cost-effectiveness, all Moyer Program funds, air district match funds, and local AB 923 funds must be included. Non-Moyer funds used to co-fund a Moyer eligible project do not need to be included in the cost-effectiveness calculation. Projects that include such funds must meet all Moyer requirements and the other funding source requirements.

Projects are subject to the cost-effectiveness limits in Table C-1, which shows the changes in the cost-effectiveness limit over time based on changes in the Consumer Price Index. Historically, one limit has been applied to all Moyer Program projects. Per SB 513, a second cost-effectiveness limit for school buses was added in 2016 as shown in the table.

**Table C-1
Cost-Effectiveness Limit Criteria 1998-2016**

Year	Annual CA CPI	Percentage change (inflation rate)	Annual Change	Revised C/E Limit
1998	163.7	NA	NA	\$12,000
1999	168.5	2.93%	\$352	\$12,352
2000	174.8	3.74%	\$462	\$12,814
2001	181.7	3.95%	\$506	\$13,319
2002	186.1	2.42%	\$323	\$13,642
2003	190.4	2.31%	\$315	\$13,957
2004	195.4	2.63%	\$367	\$14,324
2005	202.6	3.68%	\$528	\$14,852
2006	210.5	3.90%	\$579	\$15,431
2007	217.4	3.28%	\$506	\$15,938
2008	224.8	3.40%	\$541	\$16,479
2009	224.1	-0.31%	-\$51	\$16,428
2010	227.0	1.29%	\$212	\$16,640
2011	233.0	2.66%	\$443	\$17,084
2012	238.3	2.25%	\$385	\$17,469
2013	241.8	1.46%	\$255	\$17,724
2014	246.1	1.77%	\$313	\$18,037
2015	249.1	1.25%	\$225	\$18,262
2016 Base	No C/E update pending 2017 guideline update			\$18,262
2016 School Bus	New C/E Limit under SB 513			\$276,230

Table C-2 shows the cost-effectiveness limits proposed under the 2017 Guidelines. As shown, two cost-effectiveness limits are now available: one to support conventional projects and a second higher cost-effectiveness limit that air districts may choose to apply to the additional reductions provided by the cleanest engines, including those needed for long-term SIP commitments.

Base Limit: The base cost-effectiveness limit is \$30,000 per weighted ton of emissions reductions. This level allows full funding for a wide range of currently typical projects, such as diesel replacement projects for early compliance with the Truck and Bus Regulation. The level is consistent with the cost of compliance with regulations and will enable grants of sufficient size to encourage off-road engines to be replaced or repowered sooner to a Tier 4 standard.

Optional Advanced Technology Limit: For advanced technology projects that are zero-emission, or alternatively meet the cleanest optional standard level certified, air districts have the option to apply a cost-effectiveness limit of up to \$100,000 per weighted ton for the emissions reductions beyond those achieved by the required standard. The higher cost-effectiveness limit is not technology or vocation specific, but

available for technologies like the 0.02 g/bhp-hr optional low-NOx engine. To be eligible, the engine must be:

- Zero-emission or meet the cleanest optional emission standard where applicable (0.02 g/bhp-hr in the case of on-road);
- Commercially available and offered for sale; and
- Certified or verified by ARB or the United States Environmental Protection Agency

The higher cost-effectiveness limit is applied only to the incremental emission reductions beyond what the conventional project would achieve. An air district would apply the base cost-effectiveness limit for costs associated with getting engines to the cleanest required standard, and then could apply the advanced technology limit to the additional costs of getting emissions down to or below the cleanest optional standard.

**Table C-2
Cost-Effectiveness Limit Criteria 2017**

Year	Project	Proposed Change or Status	Revised C/E Limit
2017	Base Limit	New C/E Limit	\$30,000
	Optional Advanced Technology Limit	New C/E Limit for incremental reductions from specified advanced technologies	\$100,000
	School Bus	2016 C/E Limit retained in 2017 Guidelines	\$276,230

For projects in source categories without optional standards, only vehicles certified as zero-emission would be eligible for the higher cost-effectiveness limit. In these cases, the higher limit would apply to the incremental reductions below the most stringent standard for that category. General calculations for determining cost-effectiveness and other calculations needed to administer the Moyer Program are described in the following pages.

B. General Cost-Effectiveness Calculations

1. Determining the Maximum Grant Amount

The calculation methodology below must be applied in order to ensure final grant amounts meet the cost-effectiveness limit requirement, and do not exceed incremental cost based on the maximum percentage or any other funding caps. For advanced technology projects that include a baseline vehicle dirtier than the cleanest required standard, the calculations in (A), (B), and (C) below must be applied twice. The project life may differ between the first and second series of calculations, depending on availability of surplus emission reductions. The first series of calculations is made using the base cost-effectiveness limit and the emission reductions going up to the cleanest required standard (including

deterioration), and the second series of calculations is made using the advanced technology cost-effectiveness limit and the emission reductions beyond the cleanest required standard. The final maximum grant amount is equal to the combined total of the lowest values from each series. Note that school bus projects are subject to funding caps and a separate cost-effectiveness limit as listed above in Table C-2. The maximum grant amount for any given project is the lowest of the three following calculations:

- The potential grant amount at the cost-effectiveness limit;
- The potential grant amount based on maximum percentage of eligible cost; or
- The potential grant amount based on any maximum dollar amount or other funding cap specified in the relevant source category chapter.

Each of the above values is calculated as follows:

- (A) The potential grant amount at the cost-effectiveness limit is determined by multiplying the cost-effectiveness limit by the estimated annual emission reductions and dividing by the CRF in formula C-1 below.

Formula C-1: Potential grant amount at the cost-effectiveness limit (\$)

$$\text{Potential grant amount (\$)} = \text{cost-effectiveness limit (\$/ton)} * \text{estimated annual emission reductions (weighted tons/yr)} / \text{CRF}$$

The CRF is based on a discount rate. The CRF uses an interest rate and project life to determine the rate at which earnings could reasonably be expected to accrue if the same funds were invested over that length of time. The CRF may be calculated using Formula C-2 below, or you may refer to Tables D-24 and D-25 in Appendix D for CRFs at various project lives. Each source category chapter will specify which project lives are acceptable to determine which CRF value to use.

Formula C-2: Capital recovery factor

$$\text{Capital recovery factor} = (1 + \text{discount rate}^{(a)}) ^ \text{project life} * \text{discount rate} / ((1 + \text{discount rate}) ^ \text{project life} - 1)$$

^(a) Discount rate varies from year to year. See Tables D-24 and D-25 in Appendix D for CRF values at a one percent and two percent discount rate, respectively.

(1) Calculating the Annual Weighted Surplus Emission Reductions

Annual weighted surplus emission reductions are calculated using Formula C-3 below. Note that particulate matter (PM) is weighted by a factor of 20.

Formula C-3: Annual weighted surplus emission reductions (weighted tons/yr)

$$\text{Weighted emission reductions (weighted tons/yr)} = \text{NOx reductions (tons/yr)} + \text{ROG reductions (tons/yr)} + (20 * \text{PM reductions (tons/yr)})$$

The result of Formula C-3 is used to complete Formula C-1 to determine the potential grant amount at the cost-effectiveness limit, as well for Formula C-14 to determine the cost-effectiveness if not at the limit.

In order to determine the annual surplus emission reductions by pollutant, Formula C-4, C-5, C-6, C-7, or C-8 below must be completed for each pollutant (NOx, ROG, and PM), for the baseline technology and the reduced technology. Formula C-4 is the general calculation and can be applied to any project, whereas Formulas C-5, C-6, C-7 and C-8 are specific variations of Formula C-4 for use with mileage, hours of operation, fuel use, and shore power systems, respectively.

All five formulas involve multiplying the engine emission factor (found in Appendix D) by the annual activity level and by other adjustment factors (such as load factor in the case of off-road equipment calculations) as specified for the calculation methodologies presented. Emission factors are also adjusted to account for in-use deterioration where applicable.

Formula C-4: Estimated annual emissions (tons/yr)

$$\text{Annual emissions by pollutant (tons/yr)} = (\text{emission factor} + \text{deterioration product (if applicable)}) * \text{annual activity} * \text{adjustment factor(s) (if applicable)} * \text{percentage operation in California} / 907,200 \text{ (g/ton)}$$

$$\text{Deterioration product} = \text{deterioration rate} * \text{total equipment activity}$$

$$\text{Total equipment activity} = \text{annual activity} * \text{deterioration life (yrs)}$$

$$\text{Deterioration life (baseline equipment) (yrs)} = \text{expected first year of operation} - \text{baseline engine model year} + (\text{project life} / 2)$$

$$\text{Deterioration life (reduced equipment) (yrs)} = \text{project life} / 2$$

The Moyer Program allows the emission reductions from a project to be calculated using a variety of methods, but mileage and hours of operation are the primary methods. Specific activity factors allowed for each project category may differ and are identified in the source category chapters.

a. Calculating Annual Emissions Based on Annual Miles Traveled

Calculations based on annual miles traveled are used for on-road projects only. Mileage records must be maintained by the engine owner as described in Chapter 4: On-Road Heavy-Duty Vehicles. Formula C-5 below describes the method for calculating pollutant emissions based on miles traveled, including the method for calculating mile-based deterioration products.

Formula C-5: Estimated annual emissions based on mileage (tons/yr)

$$\text{Annual emissions by pollutant (tons/yr)} = (\text{emission factor (g/mi)} + \text{deterioration product (g/mi) (if applicable)}) * \text{annual activity (mi/yr)} * \text{percentage operation in California} / 907,200 \text{ (g/ton)}$$

$$\text{Mile-based deterioration product (g/mi)} = \text{deterioration rate (g/mi-10,000 mi)} * \text{total equipment activity (mi)}$$

$$\text{Total equipment activity}^{(b)} \text{ (mi)} = \text{annual activity (mi/yr)} * \text{deterioration life (yrs)}$$

$$\text{Deterioration life (baseline equipment) (yrs)} = \text{expected first year of operation} - \text{baseline engine model year} + (\text{project life} / 2)$$

$$\text{Deterioration life (reduced equipment) (yrs)} = \text{project life} / 2$$

^(b) Total equipment activity for mile-based calculations is limited to 400,000 miles for school buses or 800,000 miles for other on-road vehicles. Used heavy heavy-duty replacement vehicles add 500,000 miles, medium heavy-duty vehicles add 250,000 miles, or light heavy-duty vehicles add 150,000 miles.

b. Calculating Annual Emissions Based on Hours of Operation

When hours of equipment operation are the basis for determining emissions, the horsepower rating of the engine and an engine load factor found in Appendix D must be used. The method for calculating emissions based on hours of operation is described in Formula C-6 below, and includes the method for calculating hour-based deterioration product.

Formula C-6: Estimated annual emissions based on hours of operation (tons/yr)

$$\text{Annual emissions by pollutant (tons/yr)} = (\text{emission factor (g/bhp-hr)} + \text{deterioration product (g/bhp-hr) (if applicable)}) * \text{horsepower (hp)} * \text{load factor} * \text{annual activity (hrs/yr)} * \text{percentage operation in California} / 907,200 \text{ (g/ton)}$$

$$\text{Hour-based deterioration product (g/bhp-hr)} = \text{deterioration rate (g/bhp-hr-hr)} * \text{total equipment activity (hrs)}$$

$$\text{Total equipment activity}^{(c)} \text{ (hrs)} = \text{annual activity (hrs/yr)} * \text{deterioration life (yrs)}$$

$$\text{Deterioration life (baseline equipment) (yrs)} = \text{expected first year of operation} - \text{baseline engine model year} + (\text{project life} / 2)$$

$$\text{Deterioration life (reduced equipment) (yrs)} = \text{project life} / 2$$

The engine load factor is an indicator of the nominal amount of work done by the engine for a particular application. It is given as a fraction of the rated horsepower of the engine and varies with engine application. Load factors for a variety of equipment types may be found in Appendix D.

c. Calculating Annual Emissions Based on Fuel Consumption

In some cases as outlined in each source category chapter, fuel consumption may be used to calculate annual emissions. In such cases a fuel consumption rate factor must be used to convert

^(c) Total equipment activity for hour-based calculations is limited to a maximum of 12,000 hours for diesel engines, 3,500 hours for large-spark ignition (LSI) engines with a model year of 2006 or older, or 5,000 hours for LSI engines with a model year of 2007 or newer.

emissions given in g/bhp-hr to units of grams of emissions per gallon of fuel used (g/gal). The fuel consumption rate factor is a number that combines the effects of engine efficiency and the energy content of the fuel used in that engine into an approximation of the amount of work output by an engine for each unit of fuel consumed. Formula C-7 below is used to calculate the annual emissions based on annual fuel consumed.

Formula C-7: Estimated annual emissions based on fuel consumption (tons/yr)

$$\text{Annual emissions by pollutant (tons/yr)} = \text{emission factor (g/bhp-hr)} * \text{fuel consumption rate factor (bhp-hr/gal)} * \text{annual activity (gal/yr)} * \text{percentage operation in California} / 907,200 \text{ (g/ton)}$$

d. Calculating Annual Emissions for Shore Power Systems

For marine shore power systems, calculate the estimated annual emissions by pollutant as shown in Formula C-8 below.

Formula C-8: Estimated annual emissions for shore power systems (tons/yr)

$$\text{Annual emissions by pollutant (tons/yr)} = \text{ship emission factor (g/kW-hr)} * \text{power requirements (kW)} * \text{berthing time (hrs/visit)} * \text{annual number of visits (visits/yr)} * 0.9 / 907,200 \text{ (g/ton)}$$

(2) Calculating Annual Surplus Emission Reductions by Pollutant

Subtract the annual emissions for the reduced technology from the annual emissions for the baseline technology as shown in Formula C-9 below, for NO_x, ROG and PM emissions.

Formula C-9: Annual surplus emission reductions (tons/yr)

$$\text{Annual surplus emission reductions by pollutant (tons/yr)} = \text{annual emissions for the baseline technology (tons/yr)} - \text{annual emissions for the reduced technology (tons/yr)}$$

For marine vessels with a wet exhaust system, a wet exhaust factor of 0.80 must be applied; calculate the annual surplus emission reductions as shown in Formula C-10 below.

Formula C-10: Annual surplus emission reductions for marine vessels with wet exhaust systems (tons/yr)

$$\text{Annual surplus emission reductions by pollutant (tons/yr)} = 0.80 * (\text{annual emissions for the baseline technology (tons/yr)} - \text{annual emissions for the reduced technology (tons/yr)})$$

For retrofits, multiply the baseline technology pollutant emissions by the percentage of emission reductions that the ARB-verified reduced technology is verified to following Formula C-11 below.

Formula C-11: Annual surplus emission reductions for retrofits (tons/yr)

$$\text{Annual surplus emission reductions by pollutant (tons/yr)} = \text{annual emissions for the baseline technology (tons/yr)} * \text{reduced technology verification percentage}$$

For on-road heavy-duty projects, the baseline will be the newer vehicle emissions.

For marine vessel hybrid systems, calculate the annual surplus emission reductions as shown in Formula C-12 below.

Formula C-12: Annual surplus emission reductions for marine vessel hybrid systems (tons/yr)

$$\text{Annual surplus emission reductions by pollutant (tons/yr)} = \text{total annual emissions (all engines on vessel) for the baseline technology (tons/yr)} - (\text{total annual emissions (all engines on vessel) for the baseline technology (tons/yr)} * \text{reduced technology verification percentage})$$

For marine vessels, calculate the annual surplus emission reductions for each pollutant as shown in Formula C-13 below.

Formula C-13: Total annual surplus emission reductions for marine vessels (tons/yr)

$$\text{Total annual surplus emission reductions for marine vessels by pollutant (tons/yr)} = (\text{propulsion engine annual surplus emission reductions (tons/yr)} * \text{number of propulsion engines}) + (\text{auxiliary engine annual surplus emission reductions (tons/yr)} * \text{number of auxiliary engines})$$

- (B) The potential grant amount based on maximum percentage of eligible cost is a measure of the incremental cost as determined by multiplying the cost of the reduced technology by the maximum percentage of eligible cost (from the applicable chapter) as described in Formula C-14 below.

Formula C-14: Potential grant amount based on maximum percentage of eligible cost (\$)

$$\text{Potential grant amount (\$)} = \text{cost of reduced technology (\$)} * \text{maximum percentage of eligible cost}$$

- (C) The potential grant amount based on any maximum dollar amount or other funding cap is specified in the relevant source category chapter

2. Calculating Two for One Projects

In Two for One equipment replacement projects, two baseline technology equipment are replaced with one reduced technology equipment. First, calculate the emission reduction benefits based on activity for each baseline engine separately using Formulas C-4, C-5, C-6, C-7, or C-8. These emission reductions will then be summed together before deducting the emission reduction benefits of the reduced technology using Formula C-9. See the sample calculations supplemental document for an example on this calculation methodology.

3. Calculating Split Project Life Projects

Split Project Life: Split Project Life Projects must use a separate project life for the two baseline technology scenarios. First, Formulas C-4, C-5, C-6, C-7, or C-8 must be used to calculate emission reduction by pollutant for the two baseline scenarios:

- (A) Baseline technology to phase 1 reduced technology
(B) Phase 1 reduced technology to phase 2 reduced technology

Formula C-3 is used to calculate the annual emission reductions for each baseline technology. Next, a fraction of the project life must be applied to the annual emission reductions for each of the baseline scenarios, as outlined below in Formula C-15.

Formula C-15: Split project life

$$\begin{aligned} \text{Total annual weighted surplus emission reductions (tons/yr)} = \\ (\text{fraction project life (yrs)} * \text{annual weighted surplus emissions from transaction 1 (tons/yr)} / \\ \text{total project life (yrs)}) + (\text{fraction project life (yrs)} * \\ \text{annual weighted surplus emissions from transaction 2 (tons/yr)} / \text{total project life (yrs)}) \end{aligned}$$

$$\begin{aligned} \text{Total annual weighted surplus emission reductions (tons/yr)} = \\ (n_1 * a_1 / t) + (n_2 * a_2 / t) \end{aligned}$$

where:

n_1 = fraction project life from transaction 1 (yrs)

n_2 = fraction project life from transaction 2 (yrs)

a_1 = annual weighted surplus emissions from transaction 1 (tons/yr)

a_2 = annual weighted surplus emissions from transaction 2 (tons/yr)

t = total project life (yrs)

4. Calculating the Applicant Cost Share

Moyer eligible costs are costs associated with a project that are eligible for reimbursement under the program prior to considering the cost-effectiveness limit or any project cap restrictions. Guidance on these costs is contained in Chapters 2, 3, and the applicable chapter for the Moyer project. The applicant cost share is determined by multiplying the Moyer eligible cost by 15 percent, as described in Formula C-16 below. Applicant cost share is determined from the Moyer eligible costs, but the value itself is not an ineligible Moyer cost. A public entity applicant may other use public funds toward meeting this requirement.

Formula C-16: Applicant cost share (\$)

$$\begin{aligned} \text{Applicant cost share (\$)} \geq \\ 15 \text{ percent} * \text{Moyer eligible costs (\$)} \end{aligned}$$

5. Calculation for Co-funding Moyer Funds with Other Sources

Air districts must request information from grantee to determine what other funds will be used toward the project. This information will be utilized to ensure that the applicant is not overpaid for the project by adding the Applicant Cost Share contribution and the grants paid toward the project, as shown in Formula C-17 below and comparing against the total project cost value. The total project cost includes both Moyer eligible and Moyer ineligible costs. Refer to Chapters 2 and 3 for additional criteria and guidance related to co-funding projects.

Formula C-17: Project overpayment check (\$)

$$\text{Total project cost} \geq \text{applicant cost share (\$)} + \sum \text{grants paid (\$)}$$

If the total project cost is exceeded then adjustments must be made to ensure the project applicant is not overpaid for the project.

6. Calculating the Cost-Effectiveness of a Grant Amount

The cost-effectiveness of a grant amount is determined by multiplying the CRF as calculated in Formula C-18 by the grant amount, and dividing that by the annual weighted surplus emission reductions that will be achieved by the project as calculated in Formula C-3.

Formula C-18: Cost-effectiveness of weighted surplus emission reductions (\$/tons)

$$\text{Cost-effectiveness (\$/tons)} = \text{grant amount (\$)} * \text{CRF} / \text{annual weighted surplus emission reductions (weighted tons/yr)}$$

C. List of Formulas

The necessary formulas to calculate the cost-effectiveness of surplus emission reductions for a project funded through the Moyer Program are provided below.

Formula C-1: Potential grant amount at the cost-effectiveness limit (\$)

$$\text{Potential grant amount (\$)} = \text{cost-effectiveness limit (\$/ton)} * \text{estimated annual emission reductions (weighted tons/yr)} / \text{CRF}$$

Formula C-2: Capital recovery factor (CRF)

$$\text{Capital recovery factor} = (1 + \text{discount rate}^{(d)}) ^ \text{project life} * \text{discount rate} / ((1 + \text{discount rate}) ^ \text{project life} - 1)$$

Formula C-3: Annual weighted surplus emission reductions (weighted tons/yr)

$$\text{Weighted emission reductions (weighted tons/yr)} = \text{NO}_x \text{ reductions (tons/yr)} + \text{ROG reductions (tons/yr)} + (20 * \text{PM reductions (tons/yr)})$$

Formula C-4: Estimated annual emissions (tons/yr)

$$\text{Annual emission by pollutant (tons/yr)} = (\text{emission factor} + \text{deterioration product (if applicable)}) * \text{annual activity} * \text{adjustment factor(s)} * \text{percentage operation in California} / 907,200 \text{ (g/ton)}$$

$$\text{Deterioration product} = \text{deterioration rate} * \text{total equipment activity}$$

$$\text{Total equipment activity} = \text{annual activity} * \text{deterioration life (yrs)}$$

$$\text{Deterioration life (baseline) (yrs)} = \text{expected first year of operation} - \text{baseline engine model year} + (\text{project life} / 2)$$

$$\text{Deterioration life (reduced) (yrs)} = \text{project life} / 2$$

^(d) Discount rate varies from year to year. See Tables D-24 and D-25 in Appendix D for CRF values at a 1 percent and 2 percent discount rate, respectively.

Formula C-5: Estimated annual emissions based on mileage (tons/yr)

$$\text{Annual emissions by pollutant (tons/yr)} = (\text{emission factor (g/mi)} + \text{deterioration product (g/mi) (if applicable)}) * \text{annual activity (mi/yr)} * \text{percentage operation in California / 907,200 (g/ton)}$$

$$\text{Mile-based deterioration product (g/mi)} = \text{deterioration rate (g/mi-10,000 mi)} * \text{total equipment activity (mi)}$$

$$\text{Total equipment activity}^{(e)} \text{ (miles)} = \text{annual activity (mi/yr)} * \text{deterioration life (yrs)}$$

$$\text{Deterioration life (baseline) (yrs)} = \text{expected first year of operation} - \text{baseline engine model year} + (\text{project life} / 2)$$

$$\text{Deterioration life (reduced) (yrs)} = \text{project life} / 2$$

Formula C-6: Estimated annual emissions based on hours of operation (tons/yr)

$$\text{Annual emissions by pollutant (tons/yr)} = (\text{emission factor (g/bhp-hr)} + \text{deterioration product (g/bhp-hr) (if applicable)}) * \text{horsepower (hp)} * \text{load factor} * \text{annual activity (hrs/yr)} * \text{percentage operation in California / 907,200 (g/ton)}$$

$$\text{Hour-based deterioration product (g/bhp-hr)} = \text{deterioration rate (g/bhp-hr-hr)} * \text{total equipment activity (hrs)}$$

$$\text{Total equipment activity}^{(f)} \text{ (hrs)} = \text{annual activity (hrs/yr)} * \text{deterioration life (yrs)}$$

$$\text{Deterioration life (baseline) (yrs)} = \text{expected first year of operation} - \text{baseline engine model year} + (\text{project life} / 2)$$

$$\text{Deterioration life (reduced) (yrs)} = \text{project life} / 2$$

^(e) Total equipment activity for mile-based calculations is limited to 400,000 miles for school buses or 800,000 miles for other on-road vehicles. Used heavy heavy-duty replacement vehicles add 500,000 miles, medium heavy-duty vehicles add 250,000 miles, or light heavy-duty vehicles add 150,000 miles.

^(f) Total equipment activity for hour-based calculations is limited to a maximum of 12,000 hours for diesel engines, 3,500 hours for large-spark ignition (LSI) engines with a model year of 2006 or older, or 5,000 hours for LSI engines with a model year of 2007 or newer.

Formula C-7: Estimated annual emissions based on fuel consumption (tons/yr)

$$\begin{aligned} \text{Annual emissions by pollutant (tons/yr)} = \\ \text{Emission factor (g/bhp-hr)} * \text{fuel consumption rate factor (bhp-hr/gal)} * \text{annual activity (gal/yr)} \\ * \text{percentage operation in California} / 907,200 \text{ (g/ton)} \end{aligned}$$

Formula C-8: Estimated annual emissions for shore power systems (tons/yr)

$$\begin{aligned} \text{Annual emissions by pollutant (tons/yr)} = \\ \text{Ship emission factor (g/kW-hr)} * \text{power requirements (kW)} * \text{berthing time (hrs/visit)} * \text{annual} \\ \text{number of visits (visits/yr)} * 0.9 / 907,200 \text{ (g/ton)} \end{aligned}$$

Formula C-9: Annual surplus emission reductions (tons/yr)

$$\begin{aligned} \text{Annual surplus emission reductions by pollutant (tons/yr)} = \\ \text{annual emissions for the baseline technology (tons/yr)} - \\ \text{annual emissions for the reduced technology (tons/yr)} \end{aligned}$$

Formula C-10: Annual surplus emission reductions for marine vessels with wet exhaust systems (tons/yr)

$$\begin{aligned} \text{Annual surplus emission reductions by pollutant (tons/yr)} = \\ 0.80 * (\text{annual emissions for the baseline technology (tons/yr)} - \\ \text{annual emissions for the reduced technology (tons/yr)}) \end{aligned}$$

Formula C-11: Annual surplus emission reductions for retrofits (tons/yr)

$$\begin{aligned} \text{Annual surplus emission reductions by pollutant (tons/yr)} = \\ \text{annual emissions for the baseline technology (tons/yr)} * \\ \text{reduced technology verification percentage} \end{aligned}$$

Formula C-12: Annual surplus emission reductions for marine vessel hybrid systems (tons/yr)

$$\begin{aligned} \text{Annual surplus emission reductions by pollutant (tons/yr)} = \\ \text{total annual emissions (all engines on vessel) for the baseline technology (tons/yr)} - \\ (\text{total annual emissions (all engines on vessel) for the baseline technology (tons/yr)}) * \\ \text{reduced technology verification percentage} \end{aligned}$$

Formula C-13: Total annual surplus emission reductions for marine vessels (tons/yr)

$$\begin{aligned} \text{Total annual surplus emission reductions for marine vessels by pollutant (tons/yr)} = \\ (\text{propulsion engine annual surplus emission reductions (tons/yr)} * \\ \text{number of propulsion engines}) + (\text{auxiliary engine annual surplus emission reductions (tons/yr)} * \\ \text{number of auxiliary engines}) \end{aligned}$$

Formula C-14: Potential grant amount based on maximum percentage of eligible cost (\$)

$$\begin{aligned} \text{Incremental cost (\$)} = \\ \text{cost of reduced technology (\$)} * \text{maximum percentage of eligible cost} \end{aligned}$$

Formula C-15: Split project life

$$\begin{aligned} \text{Total annual weighted surplus emission reductions (tons/yr)} = \\ (\text{fraction project life (yrs)} * \text{annual weighted surplus emissions from transaction 1 (tons/yr)} / \\ \text{total project life (yrs)}) + (\text{fraction project life (yrs)} * \\ \text{annual weighted surplus emissions from transaction 2 (tons/yr)} / \text{total project life (yrs)}) \end{aligned}$$

$$\begin{aligned} \text{Total annual weighted surplus emission reductions (tons/yr)} = \\ (n_1 * a_1 / t) + (n_2 * a_2 / t) \end{aligned}$$

where:

n_1 = fraction project life from transaction 1 (yrs)

n_2 = fraction project life from transaction 2 (yrs)

a_1 = annual weighted surplus emissions from transaction 1 (tons/yr)

a_2 = annual weighted surplus emissions from transaction 2 (tons/yr)

t = total project life (yrs)

Formula C-16: Applicant cost share (\$)

$$\begin{aligned} \text{Applicant cost share (\$)} \geq \\ 15 \text{ percent} * \text{moyer eligible costs (\$)} \end{aligned}$$

Formula C-17: Project overpayment check (\$)

$$\begin{aligned} \text{Total project cost} \geq \\ \text{applicant cost share (\$)} + \sum \text{grants paid (\$)} \end{aligned}$$

Formula C-18: Cost-effectiveness of weighted surplus emission reductions (\$/ton)

$$\begin{aligned} \text{Cost-effectiveness (\$/ton)} = \\ \text{grant amount (\$)} * \text{CRF} / \text{annual weighted surplus emission reductions (weighted tons/yr)} \end{aligned}$$

APPENDIX D:

TABLES FOR EMISSION REDUCTION AND COST-EFFECTIVENESS CALCULATIONS

This appendix presents tables summarizing the data needed to calculate the emission reductions and cost-effectiveness of potential projects. Included are data such as engine emission factors, load factors, and other conversion factors used in the calculations discussed in Appendix C: Cost-Effectiveness Calculation Methodology.

	<u>Table Number</u>
Heavy-Duty On-Road Projects	D-1 to D-6
Off-Road Diesel and Non-Mobile Agricultural (Ag) Projects	D-7 to D-9
Large Spark-Ignition (LSI) Projects	D-10 to D-13
Locomotive Projects	D-14a to D-14b
Marine Projects	D-15a to D-20
All Engines – Fuel Consumption	D-21
Reference Tables	D-22 to D-25

HEAVY DUTY ON-ROAD PROJECTS

**Table D-1
Heavy-Duty Vehicles
14,001-33,000 pounds (lbs) Gross Vehicle Weight Rating (GVWR)
Emission Factors (g/mile)^(a) (EF) and Deterioration Rates (g/mile-10k miles) (DR)**

Engine Model Year	NO _x ^(b)		ROG ^{(b),(c)}		PM ^{(b),(i)}	
	EF ^(d)	DR ^(e)	EF ^(d)	DR ^(e)	EF ^(d)	DR ^(e)
Pre-1987	14.52	0.031	0.89	0.051	0.713	0.0283
1987-90	14.31	0.041	0.70	0.060	0.774	0.0252
1991-93	10.70	0.054	0.37	0.031	0.425	0.0193
1994-97	10.51	0.063	0.27	0.036	0.241	0.0129
1998-02	10.33	0.072	0.28	0.036	0.266	0.0116
2003-06	6.84	0.071	0.23	0.021	0.175	0.0067
2007-09	3.99	0.090	0.18	0.007	0.014	0.0008
2007+ ^(f) (0.21-0.50 g/bhp-hr NO _x FEL)	1.27	0.079	0.06	0.002	0.002	0.0001
2010-12 (0.20 g/bhp-hr NO _x std)	1.03	0.079	0.06	0.002	0.002	0.0001
2013+ ^(g) (0.20 g/bhp-hr NO _x std)	1.03	0.045	0.06	0.001	0.002	0.0001
2016+ ^(h) (0.10 g/bhp-hr NO _x std)	0.52	0.023	0.06	0.001	0.002	0.0001
2016+ ^(h) (0.05 g/bhp-hr NO _x std)	0.26	0.011	0.06	0.001	0.002	0.0001
2016+ ^(h) (0.02 g/bhp-hr NO _x std)	0.10	0.005	0.06	0.001	0.002	0.0001

- (a) EMFAC 2014 Zero-Mile Based Emission Factors. Factors are based on diesel engines. Same factors used for alternative fuel engines due to limited alternative fuel data in EMFAC.
- (b) Emission factors incorporate the ultra low-sulfur diesel fuel correction factors listed in Table D-22. NO_x – Oxides of nitrogen, ROG – Reactive Organic Gases, PM – Particulate Matter.
- (c) EMFAC provides HC emission factors which are converted into ROG. $ROG = HC * 1.26639$.
- (d) Emission Factors are based on zero-mile rates contained in EMFAC 2014.
- (e) Deterioration Rate per 10,000 miles.
- (f) All model year 2007 and newer engines with Family Emission Limits (FEL) from 0.21 g/bhp-hr to 0.50 g/bhp-hr NO_x must use different emission factors from those listed for model years 2010 and newer engines certified to 0.20 g/bhp-hr NO_x standards. FEL emission factors are based on EMFAC factors for model year 2010-2012 engines that include weighted averaging of 0.5, 0.35, and 0.20 g/bhp-hr NO_x standards based on sales.
- (g) Deterioration rates for 2013+ engines incorporate use of on-board diagnostic system.
- (h) Factors for 2016+ engines are reduced values of 2013 factors by 50 percent, 75 percent, and 90 percent to correspond with 0.10 g/bhp-hr NO_x, 0.05 g/bhp-hr NO_x, and 0.02 g/bhp-hr NO_x optional low NO_x standards.
- (i) Factors for 2006 or older engines are for unfiltered trucks.

**Table D-2
Heavy-Duty Vehicles
Over 33,000 pounds (lbs) GVWR
Emission Factors (g/mile)^(a) (EF) and Deterioration Rates (g/mile-10k miles) (DR)**

Engine Model Year	NO _x ^(b)		ROG ^{(b),(c)}		PM ^{(b),(i)}	
	EF ^(d)	DR ^(e)	EF ^(d)	DR ^(e)	EF ^(d)	DR ^(e)
Pre-1987	21.37	0.018	1.38	0.031	1.260	0.0200
1987-90	21.07	0.024	1.08	0.037	1.369	0.0178
1991-93	18.24	0.037	0.78	0.027	0.574	0.0104
1994-97	17.92	0.043	0.58	0.031	0.377	0.0080
1998-02	17.61	0.049	0.60	0.031	0.415	0.0073
2003-06	11.66	0.049	0.49	0.018	0.267	0.0041
2007-09	6.80	0.077	0.39	0.007	0.022	0.0006
2007+ ^(f) (0.21-0.50 g/bhp-hr NO _x FEL)	2.17	0.068	0.13	0.002	0.004	0.0001
2010-12 (0.2 g/bhp-hr NO _x std)	1.76	0.068	0.13	0.002	0.004	0.0001
2013+ ^(g) (0.2 g/bhp-hr NO _x std)	1.76	0.039	0.13	0.001	0.004	0.0001
2016+ ^(h) (0.10 g/bhp-hr NO _x std)	0.88	0.019	0.13	0.001	0.004	0.0001
2016+ ^(h) (0.05 g/bhp-hr NO _x std)	0.44	0.010	0.13	0.001	0.004	0.0001
2016+ ^(h) (0.02 g/bhp-hr NO _x std)	0.18	0.004	0.13	0.001	0.004	0.0001

(a) EMFAC 2014 Zero-Mile Based Emission Factors. Factors are based on diesel engines. Same factors used for alternative fuel engines due to limited alternative fuel data in EMFAC.

(b) Emission factors incorporate the ultra low-sulfur diesel fuel correction factors listed in Table D-22.

(c) EMFAC provides HC emission factors which are converted into ROG. $ROG = HC * 1.26639$.

(d) Emission Factors are based on zero-mile rates contained in EMFAC 2014.

(e) Deterioration Rate are per 10,000 miles.

(f) All model year 2007 and newer engines with Family Emission Limits (FEL) from 0.21 g/bhp-hr to 0.50 g/bhp-hr NO_x must use different emission factors from those listed for model years 2010 and newer engines certified to 0.20 g/bhp-hr NO_x standards. FEL emission factors are based on EMFAC factors for model year 2010-2012 engines that include weighted averaging of 0.5, 0.35, and 0.20 g/bhp-hr NO_x standards based on sales.

(g) Deterioration rates for 2013+ engines incorporate use of on-board diagnostic system.

(h) Factors for 2016+ engines are reduced values of 2013 factors by 50 percent, 75 percent, and 90 percent to correspond with 0.10 g/bhp-hr NO_x, 0.05 g/bhp-hr NO_x, and 0.02 g/bhp-hr NO_x optional low NO_x standards, respectively.

(i) Factors for 2006 or older engines are for unfiltered trucks.

**Table D-3
Diesel Urban Buses
Emission Factors (g/mile)^(a)**

Engine Model Year	NO_x^(b)	ROG^{(b),(c)}	PM^{(b),(e)}
Pre-1987	42.97	1.88	0.929
1987-1990	37.39	1.87	0.878
1991-1993	23.72	1.84	0.835
1994-1995	27.71	1.81	1.015
1996-1998	36.46	1.81	1.217
1999-2002	18.97	1.81	0.417
2003	13.02	0.77	0.084
2004-2006	3.56	0.08	0.084
2007+ (0.20 g/bhp-hr NO _x std)	1.90	0.03	0.011
2016+ ^(d) (0.10 g/bhp-hr NO _x std)	0.95	0.03	0.011
2016+ ^(d) (0.05 g/bhp-hr NO _x std)	0.47	0.03	0.011
2016+ ^(d) (0.02 g/bhp-hr NO _x std)	0.19	0.03	0.011

(a) EMFAC 2014 Zero-Mile Based Emission Factors.

(b) Emission factors incorporate the ultra low-sulfur diesel fuel correction factors listed in Table D-22.

(c) EMFAC provides HC emission factors which are converted into ROG.
ROG = HC * 1.26639.

(d) Factors for 2016+ engines are reduced values of 2007 factors by 50 percent, 75 percent, and 90 percent to correspond with 0.10 g/bhp-hr NO_x, 0.05 g/bhp-hr NO_x, and 0.02 g/bhp-hr NO_x optional low NO_x standards, respectively.

(e) Factors for 2006 or older engines are for unfiltered trucks.

**Table D-4
Alternative Fuel Urban Buses
Emission Factors (g/mile)^(a)**

Engine Model Year	NOx	ROG ^(b)	PM ^(d)
Pre-2003	21.60	2.68	0.043
2003-06	15.40	3.87	0.023
2007+ (0.20 g/bhp-hr NOx std)	0.65	0.04	0.001
2016+ ^(c) (0.10 g/bhp-hr NOx std)	0.33	0.04	0.001
2016+ ^(c) (0.05 g/bhp-hr NOx std)	0.16	0.04	0.001
2016+ ^(c) (0.02 g/bhp-hr NOx std)	0.07	0.04	0.001

^(a) EMFAC 2014 Zero-Mile Based Emission Factors.

^(b) EMFAC provides HC emission factors which are converted into ROG.

ROG (Pre-2007 engines) = HC * 0.16137.

ROG (2007+ engines) = HC * 0.013972.

^(c) Factors for 2016+ engines are reduced values of 2007 factors by 50 percent, 75 percent, and 90 percent to correspond with 0.10 g/bhp-hr NOx, 0.05 g/bhp-hr NOx, and 0.02 g/bhp-hr NOx optional low NOx standards, respectively.

^(d) Factors for 2006 or older engines are for unfiltered trucks.

**Table D-5
Diesel Refuse Trucks
Emission Factors (g/mile)^(a)**

Engine Model Year	NO_x^(b)	ROG^{(b),(c)}	PM^{(b),(g)}
pre-1994	34.69	0.01	0.346
1994-97	31.53	0.01	0.137
1998-02	31.25	0.01	0.144
2003-06	21.39	0.01	0.086
2007-09	11.25	0.14	0.008
2007+ ^(d) (0.21-0.50 g/bhp-hr NO _x FEL)	1.23	0.26	0.008
2010+ ^(e) (0.20 g/bhp-hr NO _x std)	1.09	0.04	0.008
2016+ ^(f) (0.10 g/bhp-hr NO _x)	0.54	0.04	0.008
2016+ ^(f) (0.05 g/bhp-hr NO _x)	0.27	0.04	0.008
2016+ ^(f) (0.02 g/bhp-hr NO _x)	0.11	0.04	0.008

Note: These emission factors are not applicable to transfer trucks. Transfer trucks must use the emission factors from Table D-1 or D-2. Per EMFAC 2014, solid waste collection vehicles are considered to be well-maintained and have negligible deterioration which is why only zero-mile emission factors are to be used in calculations for solid waste collection vehicle projects.

- (a) EMFAC 2014 Zero-Mile Based Emission Factors.
- (b) Emission factors incorporate the ultra low-sulfur diesel fuel correction factors listed in Table D-22.
- (c) EMFAC provides HC emission factors which are converted into ROG.
ROG = HC * 1.26639.
- (d) All model year 2007 and newer engines with Family Emission Limits (FEL) from 0.21 g/bhp-hr to 0.50 g/bhp-hr NO_x must use different emission factors from those listed for model years 2010 and newer engines certified to 0.20 g/bhp-hr NO_x standards. FEL emission factors are based on EMFAC factors for model year 2010-2012 engines that include weighted averaging of 0.5, 0.35, and 0.20 g/bhp-hr NO_x standards based on sales.
- (e) These 2010+ emission factors are based only on engines certified to the 0.20 g/bhp-hr NO_x standard.
- (f) Factors for 2016+ engines are reduced values of 2013 factors by 50 percent, 75 percent, and 90 percent to correspond with 0.10 g/bhp-hr NO_x, 0.05 g/bhp-hr NO_x, and 0.02 g/bhp-hr NO_x optional low NO_x standards, respectively.
- (g) Factors for 2006 or older engines are for unfiltered trucks.

**Table D-6
Alternative Fuel Refuse Trucks
Emission Factors (g/mile)^(a)**

Engine Model Year	NOx	ROG^(b)	PM^(d)
Pre-2007	53.20	9.86	0.091
2007-09	18.80	3.68	0.004
2010+ (0.20 g/bhp-hr NOx std)	0.88	0.14	0.004
2016+ ^(c) (0.10 g/bhp-hr NOx)	0.44	0.14	0.004
2016+ ^(c) (0.05 g/bhp-hr NOx)	0.22	0.14	0.004
2016+ ^(c) (0.02 g/bhp-hr NOx)	0.09	0.14	0.004

Note: These emission factors are not applicable to transfer trucks. Transfer trucks must use the emission factors from Table D-1 or D-2. Per EMFAC 2014, solid waste collection vehicles are considered to be well-maintained and have negligible deterioration which is why only zero-mile emission factors are to be used in calculations for solid waste collection vehicle projects.

(a) EMFAC 2014 Zero-Mile Based Emission Factors.

(b) EMFAC provides HC emission factors which are converted into ROG.

ROG (Pre-2007 engines) = HC * 0.16137.

ROG (2007+ engines) = HC * 0.013972.

(c) Factors for 2016+ engines are reduced values of 2010 factors by 50 percent, 75 percent, and 90 percent to correspond with 0.10 g/bhp-hr NOx, 0.05 g/bhp-hr NOx, and 0.02 g/bhp-hr NOx optional low NOx standards, respectively.

(d) Factors for 2006 or older engines are for unfiltered trucks.

**OFF-ROAD PROJECTS AND
NON-MOBILE AGRICULTURAL PROJECTS**

**Table D-7
Off-Road Diesel Engines Default Load Factors**

Category	Equipment Type	Load Factor
Airport Ground Support	Aircraft Tug	0.54
	Air Conditioner	0.75
	Air Start Unit	0.90
	Baggage Tug	0.37
	Belt Loader	0.34
	Bobtail	0.37
	Cargo Loader	0.34
	Cargo Tractor	0.36
	Forklift	0.20
	Ground Power Unit	0.75
	Lift	0.34
	Passenger Stand	0.40
	Service Truck	0.20
	Other Ground Support Equipment	0.34
	Agricultural (Mobile, Portable or Stationary)	Agricultural Mowers
Agricultural Tractors		0.70
Balers		0.58
Combines/Choppers		0.70
Chippers/Stump Grinders		0.73
Generator Sets		0.74
Hydro Power Units		0.48
Irrigation Pump		0.65
Shredders		0.40
Sprayers		0.50
Swathers		0.55
Tillers		0.78
Other Agricultural		0.51
Construction		Air Compressors
	Bore/Drill Rigs	0.50
	Cement & Mortar Mixers	0.56
	Concrete/Industrial Saws	0.73
	Concrete/Trash Pump	0.74
	Cranes	0.29
	Crawler Tractors	0.43
	Crushing/Process Equipment	0.78
	Excavators	0.38
	Graders	0.41

**Table D-7
Off-Road Diesel Engines Default Load Factors
(Continued)**

Category	Equipment Type	Load Factor
Construction	Off-Highway Tractors	0.44
	Off-Highway Trucks	0.38
	Pavers	0.42
	Other Paving	0.36
	Pressure Washer	0.30
	Rollers	0.38
	Rough Terrain Forklifts	0.40
	Rubber Tired Dozers	0.40
	Rubber Tired Loaders	0.36
	Scrapers	0.48
	Signal Boards	0.78
	Skid Steer Loaders	0.37
	Surfacing Equipment	0.30
	Tractors/Loaders/Backhoes	0.37
	Trenchers	0.50
	Welders	0.45
	Other Construction Equipment	0.42
	Industrial	Aerial Lifts
Forklifts		0.20
Sweepers/Scrubbers		0.46
Other General Industrial		0.34
Other Material Handling		0.40
Logging	Fellers/Bunchers	0.71
	Skidders	0.74
Oil Drilling	Drill Rig	0.50
	Lift (Drilling)	0.60
	Swivel	0.60
	Workover Rig (Mobile)	0.50
	Other Workover Equipment	0.60
Cargo Handling	Container Handling Equipment	0.59
	Cranes	0.20
	Excavators	0.55
	Forklifts	0.30
	Other Cargo Handling Equipment	0.51
	Sweeper/Scrubber	0.68
	Tractors/Loaders/Backhoes	0.55
	Yard Trucks	0.39
Other	All	0.43

**Table D-8
Uncontrolled Off-Road Diesel Engines
Emission Factors (g/bhp-hr) (EF) and Deterioration Rates (g/bhp-hr-hr) (DR)**

Horsepower	Model Year	NOx		ROG		PM10	
		EF	DR	EF	DR	EF	DR
25-49	Pre-1988	6.51	0.000098	1.68	0.000210	0.547	0.0000424
	1988+	6.42	0.000097	1.64	0.000210	0.547	0.0000424
20-119	Pre-1988	12.09	0.00028	1.31	0.000061	0.605	0.0000440
	1988+	8.14	0.00019	0.90	0.000042	0.497	0.0000361
120+	Pre-1970	13.02	0.00030	1.20	0.000056	0.554	0.0000403
	1970-1979	11.16	0.00026	0.91	0.000042	0.396	0.0000288
	1980-1987	10.23	0.00024	0.80	0.000037	0.396	0.0000288
	1988+	7.60	0.00018	0.62	0.000029	0.274	0.0000199

**Table D-9
Controlled Off-Road Diesel Engines
Emission Factors (g/bhp-hr) (EF) and Deterioration Rates (g/bhp-hr-hr) (DR) ^(a)**

Horsepower	Tier	NOx		ROG		PM10	
		EF	DR	EF	DR	EF	DR
25-49	1	5.26	0.0000980	1.32	0.000170	0.480	0.0000372
	2	4.63	0.0000930	0.22	0.000050	0.280	0.0000218
	4 (Interim)	4.55	0.0000950	0.09	0.000036	0.128	0.0000096
	4 (Final)	2.75	0.0000570	0.09	0.000036	0.009	0.0000010
50-74	1	6.54	0.0001500	0.90	0.000042	0.552	0.0000402
	2	4.75	0.0000710	0.17	0.000025	0.192	0.0000141
	3 ^(b)	2.74	0.0000360	0.09	0.000023	0.192	0.0000141
	4 (Interim)	2.74	0.0000360	0.09	0.000023	0.112	0.0000080
	4 (Final)	2.74	0.0000360	0.09	0.000023	0.009	0.0000009
75-99	1	6.54	0.0001500	0.90	0.000042	0.552	0.0000402
	2	4.75	0.0000710	0.17	0.000025	0.192	0.0000141
	3	2.74	0.0000360	0.09	0.000023	0.112	0.0000080
	4 (Phase-Out)	2.74	0.0000360	0.09	0.000030	0.009	0.0000009
	4 (Phase-In or Alt. NOx)	2.15	0.0000270	0.08	0.000021	0.009	0.0000009
	4 (Final)	0.26	0.0000035	0.05	0.000015	0.009	0.0000009
100-174	1	6.54	0.0001500	0.62	0.000029	0.304	0.0000221
	2	4.15	0.0000600	0.15	0.000023	0.128	0.0000094
	3	2.32	0.0000300	0.09	0.000030	0.112	0.0000080
	4 (Phase-Out)	2.32	0.0000300	0.09	0.000030	0.009	0.0000004
	4 (Phase-In or Alt. NOx)	2.15	0.0000270	0.08	0.000020	0.009	0.0000004
	4 (Final)	0.26	0.0000040	0.05	0.000011	0.009	0.0000004

**Table D-9
Controlled Off-Road Diesel Engines
Emission Factors (g/bhp-hr) (EF) and Deterioration Rates (g/bhp-hr-hr) (DR) ^(a)
(Continued)**

Horsepower	Tier	NOx		ROG		PM10	
		EF	DR	EF	DR	EF	DR
175-299	1	5.93	0.0001400	0.29	0.000013	0.120	0.0000064
	2	4.15	0.0000600	0.11	0.000022	0.088	0.0000046
	3	2.32	0.0000300	0.09	0.000023	0.088	0.0000046
	4 (Phase-Out)	2.32	0.0000300	0.09	0.000023	0.009	0.0000003
	4 (Phase-In or Alt. NOx)	1.29	0.0000170	0.06	0.000017	0.009	0.0000003
	4 (Final)	0.26	0.0000036	0.05	0.000011	0.009	0.0000003
300-750	1	5.93	0.0000990	0.29	0.000010	0.120	0.0000064
	2	3.79	0.0000500	0.09	0.000023	0.088	0.0000044
	3	2.32	0.0000300	0.09	0.000023	0.088	0.0000044
	4 (Phase-Out)	2.32	0.0000300	0.09	0.000023	0.009	0.0000003
	4 (Phase-In or Alt. NOx)	1.29	0.0000170	0.06	0.000017	0.009	0.0000003
	4 (Final)	0.26	0.0000036	0.05	0.000011	0.009	0.0000003
751+	1	5.93	0.0000990	0.29	0.000010	0.120	0.0000064
	2	3.79	0.0000500	0.09	0.000023	0.088	0.0000044
	4 (Interim)	2.24	0.0000280	0.06	0.000017	0.051	0.0000021
	4 (Final)	2.24	0.0000280	0.05	0.000011	0.017	0.0000009

Note: Engines participating in the “Tier 4 Early Introduction Incentive for Engine Manufacturers” program per California Code of Regulations, Title 13, section 2423(b)(6) are eligible for funding provided the engines are certified to the final Tier 4 emission standards. The Air Resources Board (ARB) Executive Order indicates engines certified under this provision. The emission rates for these engines shall be equivalent to the emission factors associated with Tier 3 engines.

Note: For equipment with baseline engines certified under the flexibility provisions per California Code of Regulations, Titles 13, section 2423(d), baseline emission rates shall be determined by using the previous applicable emission standard or Tier for that engine model year and horsepower rating. The ARB Executive Order indicates engines certified under this provision.

^(a) Emission factors were converted using the ultra low-sulfur diesel fuel correction factors listed in Table D-23.

^(b) Alternate compliance option.

LARGE SPARK IGNITION ENGINES

Table D-10
Off-Road LSI Equipment Default Load Factors

Category	Equipment Type	Load Factor
Agriculture (Mobile, Portable or Stationary)	Agricultural Tractors	0.62
	Balers	0.55
	Combines/Choppers	0.74
	Chipper/Stump Grinder	0.78
	Generator Sets	0.68
	Sprayers	0.50
	Swathers	0.52
	Pumps	0.65
	Other Agricultural Equipment	0.55
Airport Ground Support	A/C Tug	0.80
	Baggage Tug	0.55
	Belt Loader	0.50
	Bobtail	0.55
	Cargo Loader	0.50
	Forklift	0.30
	Ground Power Unit	0.75
	Lift	0.50
	Passenger Stand	0.59
	Other Ground Support Equipment	0.50
Construction	Air Compressors	0.56
	Asphalt Pavers	0.66
	Bore/Drill Rigs	0.79
	Concrete/Industrial Saws	0.78
	Concrete/Trash Pump	0.69
	Cranes	0.47
	Gas Compressor	0.85
	Paving Equipment	0.59
	Pressure Washer	0.85
	Rollers	0.62
	Rough Terrain Forklifts	0.63
	Rubber Tired Loaders	0.54
	Skid Steer Loaders	0.58
Tractors/Loaders/Backhoes	0.48	

Table D-10
Off-Road LSI Equipment Default Load Factors
(Continued)

Category	Equipment Type	Load Factor
Construction	Trenchers	0.66
	Welders	0.51
	Other Construction	0.48
Industrial	Aerial Lifts	0.46
	Forklifts	0.30
	Sweepers/Scrubbers	0.71
	Other Industrial	0.54

**Table D-11a
Off-Road LSI Engines
Emission Factors (g/bhp-hr) (EF) and Deterioration Rates (g/bhp-hr-hr) (DR)
Gasoline**

Horsepower	Model Year	NOx		ROG		PM10	
		EF	DR	EF	DR	EF	DR
25-50	Uncontrolled pre-2004	8.01	0.0000406	3.760	0.000412	0.060	0.000
	Controlled 2001 - 2006	1.33	0.0004710	0.710	0.000169	0.060	0.000
	Controlled 2007 - 2009	0.89	0.0001192	0.473	0.000064	0.060	0.000
	Controlled 2010+	0.27	0.0000250	0.142	0.000013	0.060	0.000
51-120	Uncontrolled Pre-2004	11.84	0.0000601	2.630	0.000287	0.060	0.000
	Controlled 2001 – 2006	1.78	0.0002070	0.260	0.000081	0.060	0.000
	Controlled 2007 - 2009	1.17	0.0000660	0.130	0.000074	0.060	0.000
	Controlled 2010+	0.35	0.0000300	0.030	0.000014	0.060	0.000
121+	Uncontrolled pre-2004	12.94	0.0001270	1.610	0.000042	0.060	0.000
	Controlled 2001 – 2006	1.94	0.0002780	0.160	0.000102	0.060	0.000
	Controlled 2007 - 2009	1.17	0.0000660	0.130	0.000074	0.060	0.000
	Controlled 2010+	0.35	0.0000300	0.030	0.000014	0.060	0.000

**Table D-11b
Off-Road LSI Engines
Emission Factors (g/bhp-hr) (EF) and Deterioration Rates (g/bhp-hr-hr) (DR)
Alternative Fuels**

Horsepower	Model Year	NOx		ROG		PM10	
		EF	DR	EF	DR	EF	DR
25-50	Uncontrolled pre-2004	13.00	0.0000662	1.380	0.000151	0.060	0.000
	Controlled 2001 - 2006	1.95	0.0002760	0.140	0.000106	0.060	0.000
	Controlled 2007 - 2009	1.30	0.0000011	0.093	0.000172	0.060	0.000
	Controlled 2010+	0.39	0.0000002	0.028	0.000036	0.060	0.000
51-120	Uncontrolled pre-2004	10.53	0.0000533	1.550	0.000169	0.060	0.000
	Controlled 2001 – 2006	1.58	0.0003500	0.160	0.000103	0.060	0.000
	Controlled 2007 - 2009	1.04	0.0000125	0.100	0.000047	0.060	0.000
	Controlled 2010+	0.31	0.0000380	0.030	0.000014	0.060	0.000
121+	Uncontrolled pre-2004	10.51	0.0001040	1.380	0.000035	0.060	0.000
	Controlled 2001 – 2006	1.58	0.0002640	0.140	0.000106	0.060	0.000
	Controlled 2007 - 2009	1.04	0.0000125	0.100	0.000047	0.060	0.000
	Controlled 2010+	0.31	0.0000380	0.030	0.000014	0.060	0.000

**Table D-12
Emission Factors for Off-Road LSI Engine Retrofits
Verified to Absolute Emission Number (g/bhp-hr)**

Manufacturers of LSI retrofit systems may verify to a percentage emission reduction or absolute emissions. If a retrofit system is verified to a percentage reduction, the emission factors will be that verified percentage of the appropriate emissions factors in Table D-11a or D-11b. If a retrofit system is verified to an absolute emission number, when calculating emission reductions use the following table for the emission factors and the deterioration rate for the baseline engine.

Fuel	Verified Value	NOx	ROG	PM10
Gasoline	3.0	1.78	0.26	0.060
	2.5	1.48	0.22	0.060
	2.0	1.19	0.17	0.060
	1.5	0.89	0.13	0.060
	1.0	0.59	0.09	0.060
	0.6	0.35	0.03	0.060
	0.5	0.29	0.03	0.060
Alt Fuel	3.0	1.58	0.16	0.060
	2.5	1.32	0.13	0.060
	2.0	1.05	0.11	0.060
	1.5	0.79	0.08	0.060
	1.0	0.53	0.05	0.060
	0.6	0.31	0.03	0.060
	0.5	0.26	0.03	0.060

Table D-13a
Off-Road LSI Engines Certified to Optional Standards
Emission Factors (g/bhp-hr) (EF) and Deterioration Rates (g/bhp-hr-hr) (DR)
Gasoline

Horsepower	Optional Standard	NOx		ROG		PM10	
		EF	DR	EF	DR	EF	DR
25-50	0.4	0.18	0.000017	0.09	0.0000087	0.060	0.000
	0.2	0.09	0.000008	0.05	0.0000043	0.060	0.000
	0.1	0.04	0.000005	0.02	0.0000027	0.060	0.000
51-120	0.4	0.24	0.000021	0.04	0.0000034	0.060	0.000
	0.2	0.12	0.000010	0.02	0.0000017	0.060	0.000
	0.1	0.06	0.000005	0.01	0.0000009	0.060	0.000
121+	0.4	0.26	0.000022	0.02	0.0000017	0.060	0.000
	0.2	0.13	0.000011	0.01	0.0000009	0.060	0.000
	0.1	0.06	0.000005	0.01	0.0000009	0.060	0.000

Table D-13b
Off-Road LSI Engines Certified to Optional Standards
Emission Factors (g/bhp-hr) (EF) and Deterioration Rates (g/bhp-hr-hr) (DR)
Alternative Fuels

Horsepower	Optional Standard	NOx		ROG		PM10	
		EF	DR	EF	DR	EF	DR
25-50	0.4	0.26	0.000022	0.02	0.0000017	0.060	0.000
	0.2	0.13	0.000011	0.01	0.0000009	0.060	0.000
	0.1	0.07	0.000006	0.00	0.0000000	0.060	0.000
51-120	0.4	0.21	0.000031	0.02	0.0000030	0.060	0.000
	0.2	0.11	0.000015	0.01	0.0000013	0.060	0.000
	0.1	0.05	0.000007	0.01	0.0000013	0.060	0.000
121+	0.4	0.21	0.000034	0.01	0.0000016	0.060	0.000
	0.2	0.11	0.000015	0.01	0.0000013	0.060	0.000
	0.1	0.05	0.000010	0.00	0.0000000	0.060	0.000

LOCOMOTIVES

Table D-14a
Locomotive Emission Factors (g/bhp-hr)
Based on 1998 Federal Standards

Engine Model Year	Type	NO _x ^(a)	ROG ^(b)	PM10 ^(a)
Pre-1973	Line-haul and Passenger	12.22	0.51	0.275
	Switcher	16.36	1.06	0.378
1973-2001 Tier 0	Line-haul and Passenger	8.93	1.05	0.516
	Switcher	13.16	2.21	0.619
2002-2004 Tier 1	Line-haul and Passenger	6.96	0.58	0.387
	Switcher	10.34	1.26	0.464
2005-2011 Tier 2	Line-haul and Passenger	5.17	0.32	0.172
	Switcher	7.61	0.63	0.206

Note: These factors are to be used for the project baseline emissions if the baseline locomotive is certified or required to be certified to the 1998 federal locomotive remanufacture standards, and for the reduced emission locomotive if the project locomotive is remanufactured to these 1998 standards. Factors are based upon Regulatory Impact Analysis: Final United States Environmental Protection Agency (U.S. EPA) Locomotive Regulation (2008).

^(a) NO_x and PM10 emission factors have been adjusted by a factor of 0.94 and 0.86, respectively, to account for use of California ultra-low sulfur diesel fuel.

^(b) ROG = HC * 1.053

**Table D-14b
Locomotive Emission Factors (g/bhp-hr)
Based on 2008 Federal Standards**

Engine Model Year	Type	NO _x ^(a)	ROG ^(b)	PM ₁₀ ^(a)
1973-2001 Tier 0+	Line-haul and Passenger	6.96	0.58	0.189
	Switcher	11.09	2.21	0.224
2002-2004 Tier 1+	Line-haul and Passenger	6.96	0.58	0.189
	Switcher	10.34	1.26	0.224
2005-2011 Tier 2+	Line-haul and Passenger	5.17	0.32	0.086
	Switcher	7.61	0.63	0.112
2011-2014 Tier 3	Line-haul and Passenger	5.17	0.32	0.086
	Switcher	4.70	0.63	0.086
2015 Tier 4	Line-haul and Passenger	1.22	0.15	0.026
	Switcher	1.22	0.15	0.026

Note: These factors are to be used for the project baseline emissions if the baseline locomotive is certified or required to be certified to the new (2008) federal locomotive remanufacture standards, and for the reduced emission locomotive if the project locomotive is remanufactured to the new standards or meets Tier 3 standards. Factors are based upon Regulatory Impact Analysis: Final U.S. EPA Locomotive Regulation (2008).

^(a) NO_x and PM₁₀ emission factors have been adjusted by a factor of 0.94 and 0.86, respectively, to account for use of California ultra-low sulfur diesel fuel.

^(b) ROG = HC * 1.053

MARINE VESSELS

**Table D-15a
Uncontrolled Harbor Craft Propulsion Engine
Emission Factors (g/bhp-hr)**

Horsepower	Model Year	NOx	ROG	PM10
25-50	All	7.57	1.32	0.520
51-120	pre-1997	14.27	1.04	0.575
	1997+	9.70	0.71	0.524
121-250	pre-1971	15.36	0.95	0.527
	1971-1978	14.27	0.79	0.451
	1979-1983	13.17	0.72	0.376
	1984+	12.07	0.68	0.376
251+	pre-1971	15.36	0.91	0.506
	1971-1978	14.27	0.76	0.431
	1979-1983	13.17	0.68	0.363
	1984-1994	12.07	0.65	0.363
251-750	1995+	8.97	0.49	0.260
751+	1995+	12.07	0.60	0.363

**Table D-15b
Controlled Harbor Craft Propulsion Engine
Emission Factors (g/bhp-hr)**

Horsepower	Tier	NOx	ROG	PM10
25-50	1	6.93	1.30	0.580
	2	5.04	1.30	0.240
	3	5.04	1.30	0.176
51-120	1	6.93	0.71	0.524
	2	5.04	0.71	0.240
	3	5.04	0.71	0.176
121-175	1	8.97	0.49	0.290
	2	4.84	0.49	0.176
	3	3.60	0.49	0.077
176-750	1	8.97	0.49	0.290
	2	4.84	0.49	0.120
	3	3.87	0.49	0.068
751-1900	1	8.97	0.49	0.290
	2	5.24	0.49	0.160
	3	3.87	0.49	0.068
1901+	1	8.97	0.49	0.290
	2	5.24	0.49	0.160
	3	4.14	0.49	0.085

Table D-16
Tier 4 Harbor Craft Propulsion Engine
Emission Standards (g/bhp-hr)
(Not applicable for engines using FEL or ABT for compliance)

Model Year	Horsepower	Tier	NOx	ROG	PM10
2016+	805-4960	4	1.34	0.142	0.030

Table D-17a
Uncontrolled Harbor Craft Auxiliary Engine
Emission Factors (g/bhp-hr)

Horsepower	Model Year	NOx	ROG	PM10
25-50	all	6.42	1.58	0.460
51-120	pre-1997	12.09	1.23	0.508
	1997+	8.14	0.85	0.417
121-250	pre-1971	13.02	1.13	0.466
	1971-1978	12.09	0.94	0.399
	1979-1983	11.16	0.86	0.333
	1984-1995	10.23	0.82	0.333
	1996+	7.75	0.59	0.255
251-750	pre-1971	13.02	1.08	0.448
	1971-1978	12.09	0.90	0.381
	1979-1983	11.16	0.81	0.321
	1984-1994	10.23	0.77	0.321
	1995+	7.60	0.58	0.230
751+	pre-1971	13.02	1.08	0.448
	1971-1978	12.09	0.90	0.381
	1979-1986	11.16	0.81	0.321
	1987-1998	10.23	0.72	0.321
	1999+	7.75	0.58	0.255

Table D-17b
Controlled Harbor Craft Auxiliary Engine
Emission Factors (g/bhp-hr)

Horsepower	Tier	NOx	ROG	PM10
25-50	1	6.54	1.54	0.511
	2	5.04	1.54	0.240
	3	5.04	1.54	0.176
51-120	1	6.93	0.85	0.464
	2	5.04	0.85	0.240
	3	5.04	0.85	0.176
121-175	1	6.93	0.58	0.255
	2	4.84	0.58	0.176
	3	3.60	0.58	0.077
176-750	1	6.93	0.58	0.255
	2	4.84	0.58	0.120
	3	3.78	0.58	0.068
751-1900	1	6.93	0.58	0.255
	2	5.24	0.58	0.160
	3	3.87	0.58	0.068
1901+	1	6.93	0.58	0.255
	2	5.24	0.58	0.160
	3	4.14	0.58	0.085

**Table D-18
Harbor Craft Load Factors**

Vessel Type	Propulsion Engine	Auxiliary Engine
Charter Fishing	0.52	0.43
Commercial Fishing	0.27	
Ferry/Excursion	0.42	
Pilot	0.51	
Tow	0.68	
Work	0.45	
Other	0.52	
Barge/Dredge	0.45	0.65
Crew & Supply	0.38	0.32
Tug	0.50	0.31

**Table D-19
Shore Power
Default Emission Rates (Grams per kilowatt-hour (g/kW-hr))**

Pollutant	Emission Rate
NOx	13.09
ROG	0.49
PM10 (marine gas oil fuel with 0.11- 0.5 % sulfur content)	0.38
PM10 (marine gas oil fuel with <= 0.10 % sulfur content)	0.25

**Table D-20
Shore Power
Default Power Requirements**

Ship Category	Ship Size / Type Default (Twenty-foot Equivalent Unit (TEU))	Power Requirement (kW)
Container Vessel	<1,000	1,000
	1,000 – 1,999	1,300
	2,000 – 2,999	1,600
	3,000 – 3,999	1,900
	4,000 – 4,999	2,200
	5,000 – 5,999	2,300
	6,000 – 6,999	2,500
	7,000 – 7,999	2,900
	8,000 – 9,999	3,300
	10,000 – 12,000	3,700
Passenger Vessel	No Default Value – Use Actual Power Requirement ^(a)	
Reefer	Break Bulk	1,300
	Fully containerized	3,300

^(a) The average power requirement for passenger vessels is 7,400 kW (ARB Oceangoing Vessel Survey, 2005).

ALL ENGINES

Table D-21
Fuel Consumption Rate Factors (bhp-hr/gal)

Category	Horsepower/Application	Fuel Consumption Rate
Non-Mobile Agricultural Engines	ALL	17.5
Locomotive	Line Haul and Passenger (Class I/II)	20.8
	Line Haul and Passenger (Class III)	18.2
	Switcher	15.2
Other	< 750 hp	18.5
	≥ 750 hp	20.8

REFERENCES

The information in these tables has already been incorporated into the preceding emission factor tables. These tables are included for informational purposes.

Table D-22
Fuel Correction Factors
On-Road Diesel Engines

Model Year	NOx	PM10	HC
Pre- 2007	0.93	0.72	0.72
2007+	0.93	0.80	0.72

**Table D-23
Fuel Correction Factors
Off-Road Diesel Engines**

Model Year	NOx	PM10	HC
Pre-Tier 1	0.930	0.720	0.720
Tier 1 – Tier 3	0.948	0.800	0.720
Tier 4	0.948	0.852	0.720

**Table D-24
Capital Recovery Factor (CRF) for Various Project Lives
At a 1% Discount Rate**

Project Life	CRF
1	1.010
2	0.508
3	0.340
4	0.256
5	0.206
6	0.173
7	0.149
8	0.131
9	0.117
10	0.106
11	0.096
12	0.089
13	0.082
14	0.077
15	0.072
16	0.068
17	0.064
18	0.061
19	0.058
20	0.055

Table D-25
Capital Recovery Factor (CRF) for Various Project Lives
At a 2% Discount Rate^{(a)(b)}

Project Life	CRF
1	1.020
2	0.515
3	0.347
4	0.263
5	0.212
6	0.179
7	0.155
8	0.137
9	0.123
10	0.111
11	0.102
12	0.095
13	0.088
14	0.083
15	0.078
16	0.074
17	0.070
18	0.067
19	0.064
20	0.061

^(a) Upon ARB approval of the 2017 Moyer Program Guidelines, the discount rate is one percent. Per statute ARB reviews and may update discount rates annually, using the average rates of return for U.S. Treasury securities and the California Consumer Price Index data available at the time of publication.

^(b) The Discount Rate varies from year to year, and may increase beyond 2 percent. The formula used to calculate the CRF based on the Discount Rate can be found in Appendix C, Formula C-2.