State of California
AIR RESOURCES BOARD

STAFF REPORT: INITIAL STATEMENT OF REASONS FOR RULEMAKING

PROPOSED AMENDMENTS TO THE AIR RESOURCES BOARD'S REGULATIONS FOR VOLUNTARY ACCELERATED LIGHT-DUTY VEHICLE RETIREMENT

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Joint Summary Report: Voluntary Accelerated Vehicle Retirement and Voluntary Repair of Vehicles

At the December 7, 2006 Air Resources Board (ARB or Board) meeting, the Board will consider two separate, but closely related proposals concerning incentive programs aimed at reducing emissions from light-duty motor vehicles. These proposals would expand opportunities for voluntary accelerated vehicle retirement (VAVR) and establish new guidance for voluntary repair of vehicles (VRV). Requirements for incentive programs are generally contained within guidelines, such as the Carl Moyer Program Guidelines. However, requirements for VAVR programs are unique because they are also contained in regulations. Therefore, two separate, but consistent proposals are necessary. Proposed revisions to the ARB's VAVR regulation would impact only VAVR. Proposed revisions to the ARB's Carl Moyer Program Guidelines would impact both VAVR and VRV. Because the reports prepared to support each proposal only address portions of the overall program, staff has prepared this joint summary report to briefly describe its overall proposal for expanding light-duty vehicle incentive program opportunities.

Background

Light-duty vehicles include passenger cars and light-duty trucks such as pick-up trucks, sport utility vehicles (SUVs), and vans. In 2005, the estimated number of light-duty vehicles in California was over 21 million. These vehicles emit nearly 600 tons per day each of reactive organic gases (ROG) and oxides of nitrogen (NOx) statewide, making them major contributors to California's air pollution. Older, light-duty vehicles (pre-1990 model years) account for 56 percent of the ROG and 41 percent of the NOx emissions from all light-duty vehicles in 2005 despite accounting for only 19 percent of the vehicle population and less than 13 percent of the vehicle miles traveled (VMT). Generally, these older vehicles emit more pollutants because of less stringent emission standards and increased wear and tear of emission control components. Even well maintained, older vehicles tend to be higher emitting than newer ones because they lack advanced emission controls.

Incentive-based vehicle retirement or repair programs offer a cost-effective means to immediately reduce emissions from older vehicles. They offer the best way to address emissions from the pre-1976 model year vehicles that are exempt from Smog Check.

Incentive Programs for Light-Duty Vehicles

The role of incentive programs as part of California's air quality strategy has increased over the past decade with the creation of, and more recent expansion of, the Carl Moyer Program. The program originally focused on reducing NOx emissions from diesel engines. However, the scope has expanded to include other emission sources, and particulate matter and ROG are now include as covered pollutants. Light-duty vehicle projects were added to the Carl Moyer Program with changes signed into law in 2004.

With the new funding opportunities, there is renewed interest in expanding the role of light-duty vehicle programs as a part of California's clean air strategy.

The ARB has identified two types of light-duty vehicle incentive projects that are eligible for funding: voluntary retirement programs (VAVR) and voluntary repair programs (VRV). Both programs have the potential to decrease excess emissions from older, high emitting vehicles. These programs may be run independently from one another, but some districts may find it beneficial to run VAVR and VRV programs in coordination, so vehicle owners have the option of choosing between vehicle repair and retirement.

Introduction to VAVR

VAVR or car scrap programs provide financial incentives to encourage vehicle owners to retire older, more polluting vehicles earlier than they would have otherwise. The ARB already has a regulation and guidance in place for VAVR programs.

The ARB adopted a regulation in 1998 that governs the operation of VAVR operations in California based on principles laid out in State law. The regulation was updated once in 2002. The regulation provides for privately-operated VAVR enterprises to purchase and retire eligible vehicles in order to generate emission reduction credits. These credits may be retired for a clean air benefit or used by businesses and industries as an alternative compliance option. The regulation assures that the emission reductions generated from accelerated retirement are real, surplus, quantifiable, and enforceable. Prior to acceptance into the program, candidate vehicles must meet registration, functional, and equipment eligibility criteria to ensure that they are fully operational vehicles that would not otherwise have been immediately retired. The current Carl Moyer Program Guidelines include project criteria for basic VAVR programs.

In conjunction with the expanded funding opportunities, a broad range of stakeholders have expressed a strong interest in incorporating the optional use of advanced technologies such as remote sensing to identify the highest emitting vehicles for possible participation in retirement or repair programs. Stakeholders have also requested that VAVR programs be permitted to generate extra emission reduction credits for retiring these high emitting vehicles. Remote sensing devices (RSD) use spectroscopy to measure the concentrations of air pollutants in vehicle's exhaust stream while the vehicle is on the roadway. Staff's proposed regulatory and guidance changes would allow the optional use of RSD or other technologies to identify high emitting vehicles. This would provide local jurisdictions additional flexibility to design programs tailored to meet local air quality challenges.

Introduction to VRV

VRV programs reduce emissions by paying for emission-related repairs on vehicles. Because vehicle owners routinely pay for repairs on their own vehicles, simply shifting the cost of repairs from the owner to the State does not, in and of itself, result in surplus emission reductions. Surplus emission reductions are achieved by funding repairs that

would not have occurred otherwise or by accelerating repairs so they occur earlier than they would have otherwise.

California's Smog Check program requires that vehicles be emission tested biennially. Vehicle's whose emissions exceed the Smog Check emission standards must be repaired to passing levels prior to being reregistered. Emission-related repairs required by the Smog Check program would not be surplus. However, identifying high emitting vehicles in between Smog Checks via RSD or other technologies and funding accelerated emission-related repairs would result in surplus emission reductions. ARB staff envisions that VRV programs would incorporate an element to identify high emitting vehicles whose owners could be contacted for voluntary participation.

The ARB does not currently have guidance in place for VRV programs. Staff's proposal would establish Carl Moyer Program Guidelines governing VRV programs.

Summary of ARB Proposals for VAVR Programs

The following summarizes the main provisions of ARB staff's proposals for expanding VAVR program opportunities. If the Board adopts ARB staff's proposed changes, two types of VAVR programs would be allowed under the regulation which we refer to as "conventional VAVR programs" and "high emitter VAVR programs," respectively.

In conventional VAVR programs, any older vehicle may be retired provided it meets the minimum eligibility requirements. Emission reductions are achieved because these older vehicles, even ones that meet their Smog Check standards, emit more pollutants than the newer vehicles that replace them upon retirement. Vehicles retired in these programs are typically 20 to 25 years old. A well maintained 20-25 year old vehicle emits on average 3 to 4 times as much as the average vehicle on the road. In high emitter VAVR programs, RSD or other technologies are used to identify the highest emitting vehicles in the fleet for possible voluntary participation. These vehicles can have emissions more than 10 times greater than an average vehicle. By targeting only the highest emitting vehicles, the programs can achieve extra emission reductions relative to conventional VAVR programs. However, these programs are more expensive to operate. Districts interesting in running VAVR programs would have the option of choosing which type of program to operate.

<u>Framework for High Emitter VAVR Programs</u>: ARB staff is proposing to modify the VAVR regulation to allow the optional use of RSD or other technologies to identify high emitting vehicles for participation in VAVR. The proposed revisions would authorize the generation of extra emission reduction credits for the retirement of vehicles identified as high emitters. The proposed regulation would provide a broad framework governing these programs instead of providing prescriptive requirements. Because these are voluntary programs, ARB staff wants to provide as much flexibility as possible for local entities to design the programs that fit best for their local air quality problems. To ensure that programs are technically sound, ARB staff is proposing that a plan detailing how the program would run be submitted to the ARB for approval in advance of starting

a high emitter VAVR program. The proposed regulation specifies the elements that must be contained in the plan to ensure that a proposed program would be technically sound.

Emission Reductions from Retiring High Emitting Vehicles: Vehicles retired through high emitter VAVR programs would be eligible to receive extra emission reductions relative to those retired in conventional VAVR programs. For conventional VAVR programs, the regulation does not require that the retired vehicle's emissions be measured, so the emission reductions are based on the average emissions the each model year vehicle. This approach does not work for vehicles identified as the highest emitting ones in the fleet. ARB staff is proposing a new calculation methodology for high emitter VAVR programs in the revisions to the Carl Moyer Guidelines. Because no VAVR programs specifically targeting the highest emitting vehicles are currently in operation, there are limited "real world" data upon which to base the calculation methodology at this time.

Stakeholders have voiced the concern that a "one size fits all" approach may not work because it may not reflect unique elements of district programs. ARB staff is proposing a calculation methodology, relying on a confirmatory Smog Check test to establish the retired vehicle's emissions. Modifications to the methodology to reflect unique features of district programs would be allowed, subject to ARB approval.

Vehicle Registration Requirement: Under the existing VAVR regulation, vehicles are required to be registered for at least 120 days prior to retirement. The registration requirement is in place to ensure that only vehicles actually being used are accepted into VAVR programs. ARB staff is proposing to change the vehicle registration requirement in the VAVR regulation from 120 days to 24 months to be consistent with the enabling legislation (Health and Safety Code Section 44094).

Emission Reduction Tables for Conventional VAVR Programs: Staff is proposing that emission reduction look-up tables for conventional VAVR programs be replaced with the underlying calculation methodology described in the staff report for the 1998 adoption of the regulation. This would allow emission reductions for future years to be calculated without needing to revise the regulation.

Clarifying Changes to VAVR Regulation: ARB staff is proposing to reorganize some of regulatory language to clarify and improve the readability of the regulation. ARB staff is also proposing to remove two sections of the regulation that are no longer applicable.

Carl Moyer Program Guidelines for Cost-Effectiveness: ARB staff is proposing criteria for calculating the cost-effectiveness of VAVR programs funded via the Carl Moyer Program. These would specify how districts allocate the costs of running RSD-based programs.

Summary of ARB Proposals for VRV Programs

Because vehicle owners routinely pay for repairs on their own vehicles, surplus emission reductions are achieved only by funding repairs that would not have occurred otherwise or accelerating repairs so they occur earlier than they would have otherwise. Distinguishing repairs that would only occur with State funding from those that would have happened in the absence of funding is a challenge.

Vehicle Eligibility: To ensure that emission reductions are surplus, vehicles must be outside of their biennial Smog Check window. Only vehicles identified through RSD, high emitter profile, or equivalent program would be eligible. Vehicles would be given a confirmatory Smog Check test to verify that they are high emitting and establish their emissions. Vehicles would also need to meet functional and registration requirements.

Repair Requirement: Ensuring that emission control system failures are correctly diagnosed and repaired so real emission reductions are achieved is critical to the success of repair projects. Staff is proposing project criteria requiring systematic diagnosis and repair in accordance with standard industry protocols to ensure that vehicles are correctly and efficiently repaired. To make sure repairs are durable, they must bring emissions below the Smog Check pass/fail emission standards in order to be creditable. This requirement aims to prevent partial repairs that may be short lived.

Program Design: During the development of these guidelines, air district representatives encouraged ARB to provide flexibility for districts to develop specialized programs to address unique, local circumstances. District staff also voiced concerns that if the program criteria are too prescriptive, districts may be limited in designing programs. ARB staff agrees that districts need flexibility in designing programs provided they incorporate sufficient controls to ensure the emission reductions are real, quantifiable, enforceable, and surplus. Staff is proposing that districts submit VRV project plans for ARB approval that would describe how the program would run.

Calculating Emission Reductions: ARB staff is proposing that emission reductions be based on the difference in emissions between pre-repair and post-repair Smog Check tests. Staff is also proposing a one year credit life for repairs to avoid double counting the emission benefits of the Smog Check program. On average, vehicles are one year away from their next biennial Smog Check test. High emitting vehicles identified between Smog Checks and repaired in these voluntary programs would have needed to be repaired after failing their next biennial Smog Check test.

Cost-Effectiveness: ARB staff is proposing criteria for calculating the cost-effectiveness of VRV programs funded using Carl Moyer Program funds. These would specify how districts allocate the costs of running RSD-based programs and how to account for funds spent to diagnose and attempt repairs not resulting in emission reductions.

Conclusion

ARB staff is proposing comprehensive changes to both the VAVR regulation and Carl Moyer Program Guidelines to utilize current technology to identify high emitting vehicles for retirement or repair. The proposed changes allow significant flexibility for districts to design their own targeted programs while providing sufficient oversight to ensure that projects achieve real, surplus, quantifiable, enforceable reductions.

Staff Report: Initial Statement of Reasons for Rulemaking

Proposed Amendments to the Air Resources Board's Regulations for Voluntary Accelerated Light-Duty Vehicle Retirement

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Executive Summary

Air pollution is a serious problem for California. Over 90 percent of Californians live in areas that have unhealthful air at times. Air pollution has been tied to serious health impacts. Studies have linked particulate pollution to premature death in the elderly and other vulnerable populations. Research also shows that children exposed to unhealthful levels of ozone, or smog, suffer decreased lung function growth and increased asthma.

Light-duty voluntary accelerated vehicle retirement (VAVR or car scrap) programs provide an opportunity to reduce the emissions which contribute to air pollution by offering financial incentives to encourage vehicle owners to retire older, more polluting vehicles earlier than they would have otherwise. Voluntary vehicle retirement programs are a part of California's strategy to achieve clean air.

The Air Resources Board (ARB) adopted regulations in 1998 that govern the operation of VAVR programs in California in accordance with guiding principles laid out in State law. These regulations were updated in 2002. The ARB's regulations provide for privately-operated, market-based VAVR enterprises to purchase and retire eligible vehicles in order to generate mobile source emission reduction credits. These credits may be retired for a clean air benefit or used by businesses and industries as an alternative compliance option. The ARB regulations assure that the emission reductions generated from accelerated vehicle retirement are real, surplus, quantifiable, and enforceable. Prior to acceptance into the program, candidate vehicles must meet registration and functional and equipment eligibility criteria to ensure that they are fully operational and would not otherwise have been immediately retired. To accommodate car collectors and others with potential interest in vehicles offered for retirement, the regulations require that VAVR programs provide the public with an opportunity to purchase vehicles in whole or in part before the vehicle is retired.

Although there has been interest in vehicle retirement since these programs were first introduced in California in the early 1990s, lack of funding has stood in the way of large scale implementation of retirement programs. However, legislative changes signed into law in 2004 expand the Carl Moyer Program, provide an ongoing funding source of up to $140 million annually, and allow vehicle retirement programs to be included in the funding if air districts choose. With new funding opportunities, there is renewed interest in expanding the role of vehicle retirement as a part of California's clean air strategy.

In conjunction with the expanded funding opportunities, a broad range of stakeholders have expressed a strong interest in incorporating advanced technologies, such as remote sensing devices (RSD), to identify high emitting vehicles for possible participation as an optional element in retirement programs. This would provide local jurisdictions additional flexibility to design programs tailored to meet local air quality challenges. Staff's proposed changes include modification to the regulation to allow the optional use of RSD or other technologies to identify high emitting vehicles.

Some districts may choose to administer programs where eligibility is determined by vehicle age, where any vehicle older than a particular age may be retired provided it meets the eligibility requirements specified in the regulation. These are the programs that have typically been operated in California. We refer to these a "conventional VAVR programs." Others may choose to administer programs using RSD or other technologies and only offer participation to owners of the highest emitting vehicles, regardless of vehicle age. We refer to these a "high emitter VAVR programs." The current regulation already accommodates conventional VAVR programs. The proposed changes will accommodate programs that target high emitting vehicles for VAVR.

Summary of Proposed Changes

Provisions for High Emitter VAVR Programs: ARB staff is proposing to modify the VAVR regulation to allow the optional use of RSD or other technologies to identify high emitting vehicles for participation in VAVR. The proposed revisions would authorize the generation of extra emission reduction credits for the retirement of vehicles identified as high emitters. The proposed regulation would provide a broad framework governing these programs instead of providing prescriptive requirements. Because these are voluntary programs, ARB staff wanted to provide as much flexibility as possible for local entities to design the programs that fit best for their local air quality problems. To ensure that programs are technically sound, ARB staff is proposing that a plan detailing how the program would run be submitted to ARB for approval in advance of starting a high emitter VAVR program. The proposed regulation specifies the elements that must be contained in the plan to ensure that a proposed program would be technically sound.

Vehicle Registration Requirement: Under the existing VAVR regulation, vehicles are required to be registered for at least 120 days prior to retirement. The registration requirement is in place to ensure that only vehicles actually being used are accepted into VAVR programs. ARB staff is proposing to change the vehicle registration requirement in the VAVR regulation from 120 days to 24 months to be consistent with the enabling legislation (Health and Safety Code Section 44094).

Emission Reduction Tables for Conventional VAVR Programs: When the Board adopted the VAVR regulation in 1998, the methodology for calculating emission reductions for conventional VAVR programs was described in the staff report. The regulation includes emission reduction look-up tables based on that methodology. For ease of program implementation, ARB staff is proposing to replace the tables currently in the regulation with the underlying methodology from the 1998 staff report, so emission reductions for future years can be calculated without revising the regulation.

Clarifying Changes: ARB staff is proposing to reorganize some of regulatory language to clarify and improve the readability of the regulation. ARB staff is also proposing to remove two sections of the regulation that are no longer applicable.

Staff Recommendation

The proposed changes to the VAVR regulation expand the opportunities to reduce air pollution through the retirement of a wider range of older, more polluting vehicles and from high emitting vehicles. Additionally, the proposed changes provide the flexibility requested by some stakeholders and increases the safeguards requested by others to ensure that programs are administered and operated in an effective manner and that emission reductions are real, surplus, quantifiable, and enforceable. ARB staff recommends that the Board adopt the proposed changes to the VAVR regulation.

I. Introduction

Light-duty voluntary accelerated vehicle retirement (VAVR or car scrap) programs provide financial incentives to encourage vehicle owners to retire older, more polluting vehicles earlier than they would have otherwise, thereby reducing emissions. Voluntary vehicle retirement programs are a part of California's overall strategy to achieve clean air. These programs were first introduced to California in the early 1990s and have garnered renewed interest with recent legislative changes that provide additional funding sources for VAVR programs.

The Air Resources Board (ARB) first adopted the regulation governing the operation of light-duty VAVR programs in 1998 as directed under State law. ARB staff is proposing revisions to the VAVR regulation that would complement the existing regulation by providing additional flexibility. The proposed changes would allow the optional use of remote sensing or other technologies to identify high emitting vehicles and solicit the owner's participation in a VAVR program. This would provide local air districts additional options to craft programs to meet local air quality challenges.

A. Emissions from Light-Duty Vehicles

Light-duty vehicles include passenger cars and light-duty trucks such as pick-up trucks, sport utility vehicles (SUVs), and vans. In 2005, the estimated number of light-duty vehicles in California was over 21 million. This number is expected to increase to over 23 million vehicles by 2010. Light-duty vehicles are major contributors to California's air pollution problem. The oxides of nitrogen (NOx), reactive organic gas (ROG), and particulate matter (PM10) emissions from the light-duty fleet are shown in Table 1.

Table 1
Statewide Emissions from On-Road Light-Duty Vehicles
(tons per day)

Year	Population	NOx	ROG	PM10
2005	21,500,000	574	583	29
2010	23,700,000	388	405	32

Source: ARB 2006 Almanac Emission Projection Data (http://www.arb.ca.gov/ei/emissiondata.htm)

Although emissions from light-duty vehicles are decreasing with the implementation of stricter emission control standards, light-duty vehicles still contribute about half of the smog producing emissions from all on-road vehicles. Reducing emissions from the existing light-duty fleet is an important part of California's strategy to meet the health-based ambient air quality standards.

According to the ARB's emission inventory, older, light-duty vehicles (pre-1990 model years) account for 56 percent of the ROG and 41 percent of the NOx emissions from all light-duty vehicles in 2005 despite accounting for only 19 percent of the vehicle population and less than 13 percent of the vehicle miles traveled (VMT). Generally, these older vehicles emit more pollutants because of less stringent emission standards

and increased wear and tear on emission control components. As a result, older vehicles tend to be major contributors to air pollution in California.

Incentive-based vehicle retirement programs offer a cost-effective means of immediately reducing emissions from older vehicles. In fact, these programs are one of the few ways to immediately reduce emissions from older vehicles, and the best way to address emissions from the pre-1976 model year vehicles that are exempt from California's Smog Check program.

B. VAVR Background

The goal of VAVR programs is to provide financial incentives to encourage vehicle owners to retire their older, more polluting vehicles sooner than would have occurred naturally, thereby eliminating the emissions associated with their operation. VAVR programs in California are strictly voluntary. They are overseen by the ARB and administered by local air districts. In addition to district administered VAVR programs, the Bureau of Automotive Repair (BAR) operates a vehicle retirement program as part of the Smog Check's Consumer Assistance Program. The district-administered and BAR programs are designed to complement one another. The provisions governing VAVR programs are established in State laws and ARB regulations, as described below.

1. Legislative and Regulatory History of VAVR

California's interest in vehicle retirement (or car scrap) programs has grown since programs were first introduced in the early 1990s. In the 1994 State Implementation Plan (SIP), the ARB included a commitment, known as measure M1, to voluntarily scrap over 75,000 vehicles a year in the South Coast. The inclusion of a vehicle retirement measure in the SIP was followed by the adoption of the State law – Senate Bill (SB) 501 (Statutes of 1995, Calderon) – and the ARB regulations which establish the framework for VAVR programs in California.

<u>SB 501 (Statutes of 1995, Calderon)</u>

Legislation signed in 1995, (SB 501) added sections 44100 et seq., Article 10, to the California Health and Safety Code which provide the legislative framework for VAVR programs in California. This Bill was backed by a business and industry coalition that advocated adding the scrap measure to the 1994 SIP. Article 10 required the ARB to adopt regulations to govern light-duty retirement programs statewide which would include market-based, privately-operated VAVR enterprises and the generation of emission reduction credits. It also directed the ARB to operate a pilot program to assess the cost and emission reduction benefits of scrap programs. Large scale funding never materialized preventing the operation of the large-scale scrap program or purchase of emission reductions from scrapped vehicles as envisioned by SIP Measure M1 and the Legislature. Measure M1 was subsequently removed from the SIP.

1998 VAVR Regulation

In 1998, as required by statute, the ARB adopted regulations governing VAVR programs. [ARB, 1998] These regulations provide for privately-operated, market-based VAVR enterprises to purchase and retire eligible vehicles in order to generate mobile source emission reduction credits. These credits may be retired for a clean air benefit, or used by businesses and industries as an alternative compliance option. Local air districts that allow mobile source emission reduction credits to be generated from scrap programs must use ARB's regulations.

The ARB regulations assure that the emission reductions generated from accelerated vehicle retirement are real, surplus, quantifiable, and enforceable. The regulations are intended to ensure that the scrapped vehicles were fully operational and would not otherwise have been immediately retired. This is critical because millions of vehicles are naturally scrapped every year as they reach the end of their useful life. Without appropriate regulations, VAVR programs would be paying for what would have happened anyway. Toward this goal, scrapped vehicles must meet a registration requirement and pass a functional and equipment eligibility inspection.

VAVR enterprises participating in district vehicle retirement programs must notify the local air district of their intention to commence operations and demonstrate their ability to comply with the regulatory provisions. Local air districts are responsible for approving and issuing emission reduction credits generated from VAVR enterprises. Under the regulation, local districts can initiate any enforcement or remedial action necessary against noncompliant enterprises.

To accommodate car collectors and others with potential interest in vehicles offered for retirement, VAVR programs provide the public with an opportunity to purchase vehicles before the vehicle is retired. Vehicles accepted into the program must be dismantled to such a degree that it and its parts are rendered unusable.

The ARB Pilot Program

As directed under State law, the ARB conducted a pilot program from November 1998 to November 1999 in Southern California. [Sierra Research, 2000] One thousand and one vehicles were scrapped with a $500 cash incentive paid for each vehicle. The pilot program confirmed that almost all motorists who scrap a vehicle replace that vehicle with a newer, cleaner car. The scrapped vehicles ranged from about 9 to 34 years old, with the average being about 18 years old. Follow-up surveys found that about 60 percent of vehicle sellers purchased a replacement vehicle, and about one-third replaced the scrapped vehicle with another vehicle they already owned. The remainder, about seven percent, turned to alternative transportation modes such as transit, bicycle, or carpooling.

The average replacement vehicle, regardless of whether it was purchased or already in the household, was about 10 years old – or about 8 years newer than the average

scrapped vehicle. Because the average car on the road is about 10 years old, vehicle sellers replaced their scrapped vehicles with vehicles that are about average in age.

While the results of the pilot program were encouraging, funding limitations at the time did not permit expansion of the program to achieve the emission reductions called for in the 1994 SIP.

2002 Revisions to VAVR Regulation

The ARB approved minor revisions to the VAVR regulations in 2002 that largely align the vehicle eligibility criteria with the eligibility criteria for the vehicle retirement component of BAR's Smog Check Consumer Assistance Program. [ARB, 2001] The 2002 revisions also provided for the recovery of non-emission control related parts from vehicles prior to their destruction which addressed concerns of car collectors over the availability of replacement parts for older vehicles.

Assembly Bill (AB) 923 (Statutes of 2004, Firebaugh)

Legislative changes to the Carl Moyer Program, enacted with the signing of AB 923 (Firebaugh, 2004), added light-duty vehicle projects to the list of allowable projects and provided additional means of funding VAVR programs to reduce NOx, ROG, and PM10 emissions. In 2005, the ARB adopted revisions to the Carl Moyer Program Guidelines, in part to address these legislative changes. The 2005 revisions included project criteria for conventional VAVR programs, consistent with the provisions of the VAVR regulation. [ARB, 2006]

With the new funding opportunities, there is potential to expand the role of vehicle retirement as a part of California's clean air strategy. Several air districts have recently initiated VAVR programs using funding authorized under AB 923, and others are considering starting programs.

2. VAVR Programs in California

This section discusses the vehicle retirement programs in California, including district programs operated under the ARB regulations and BAR's Smog Check Consumer Assistance Program. These programs are also described in the ARB's 2004 *Report to the California Legislature: Accelerated Light-Duty Vehicle Retirement Program*. [ARB, 2004]

Local Air District Programs

To date, four local air districts have operated VAVR programs under ARB's regulations – the Bay Area Air Quality Management District (AQMD), San Diego Air Pollution Control District (APCD), Santa Barbara APCD, and South Coast AQMD. The program in the San Diego APCD has ended, but programs continue to operate in the other three districts. About 5,000 vehicles a year are scrapped in these programs. [ARB, 2004] In

these programs, participants are paid $500 between $800 to retire their vehicles. Most vehicles retired are between 20 and 25 years old and are assumed to have average emissions for their age.

In three of the four districts, the light-duty vehicle scrap program depends on district funds. These districts retire all of the emission benefits for clean air. In contrast, the South Coast program generates marketable emission reduction credits. These credits are discounted by 17 percent to provide a clean air benefit, and can then be purchased by businesses to comply with certain South Coast AQMD rules.

The cost-effectiveness of district VAVR programs varies depending upon the age of the scrapped vehicles. Based on the most recent data self reported by the local air districts, the district scrap programs provide emission reductions at a cost of approximately $1.50 to $4.50 a pound of ozone precursors (ROG + NOx). [ARB, 2004] These values are not directly comparable to traditional Carl Moyer Program cost-effectiveness values because some districts included administrative and overhead costs in their estimates.

In 2006, the South Coast AQMD is starting a "Light Duty Vehicle Remote Sensing, Repair, and Scrapping Program" funded under the provisions of AB 923, which would retire the emission benefits for clean air. This program is described in Section D, below.

Bureau of Automotive Repair Consumer Assistance Program

In addition to district VAVR programs, the BAR Smog Check Program includes a voluntary vehicle retirement element. [BAR, 2006} As part of BAR's Consumer Assistance Program, owners of qualifying vehicles that fail the biennial inspection are given the option of voluntarily retiring their vehicle rather than repairing it. BAR offers $1,000 in exchange for the vehicle. This program provides a safety valve for motorists with failing vehicles who may have had difficulty affording repairs or deemed repair too costly. The BAR program retired about 15,000 vehicles in fiscal year 2005-2006 and expects to expand the number to about 18,000 annually in 2006-2007.

C. Introduction to Remote Sensing

Studies have shown that remote sensing can be used as an effective tool in identifying the highest emitting vehicles operating on the roadways. [ESP, 2003] [Lawson, 1996] Consequently, there is interest in using remote sensing as a tool to identify high emitting vehicles whose owners may be contacted for voluntary participation in vehicle retirement or repair programs. A focus of the proposed changes to the VAVR regulation is to incorporate the optional use of remote sensing and other technologies to identify high emitting vehicles for voluntary participation in retirement programs.

Remote sensing devices (RSD) are analytical instruments that use spectroscopy to measure the concentrations of air pollutants in vehicle's exhaust stream while the vehicle is on the roadway. [BAR, 2003] A photograph of the vehicle's license plate is also recorded, so that measured emissions can be matched to a particular vehicle.

Typically, a beam of infrared and/or ultraviolet light is sent across a vehicle's pathway and is reflected back into light detectors. When more of the light beam is absorbed by the vehicle's exhaust, the instrument will indicate a higher concentration of the air pollution. The measurement takes less than one half second and provides a snapshot in time of how the vehicle is operating under the road and operating conditions where the measurement takes place.

Several parameters affect the quality of RSD readings, so care must be taken when designing RSD programs in selecting site locations that offer the best potential to produce valid measurements. [Bishop & Stedman, 2006] [Wenzel, 2005] Road width, the distance between one vehicle and another, the height of the tailpipe, and weather conditions all potentially affect the results. Additionally, the driving characteristics of the vehicle play an important role in whether or not a measurement is valid. To increase the chances of a valid measurement, the vehicle must be operating within a limited accelerating or decelerating range during the measurement.

Although RSD can be used to identify high emitting vehicles, ARB staff does not believe that the technology has developed to the point where a split second RSD measurement of a vehicle's exhaust can quantitatively represent its average emissions over a full driving cycle such as the federal test procedure (FTP). For that reason, ARB staff believes RSD measurements should be used as screening tools to identify possible high emitting vehicles for participation in retirement or repair programs. In the guidance for calculating the emission benefits for retiring or repairing high emitting vehicles, staff is proposing that vehicles identified via RSD or other technologies receive confirmatory Smog Check tests to estimate their emissions.

The costs of running RSD programs can vary greatly depending on the scope and intent of the program. Sampling locations and times must be selected to ensure a representative sample of the fleet is observed. Some vehicles may drive by RSD locations many times and other vehicles may seldom or never drive by. So, in practice, the number of unique vehicle readings will generally be much less than the total number of records collected because some vehicles may be seen over and over again. To provide an example of potential costs, the South Coast AQMD is budgeting on the order of $900,000 to obtain about 3 million valid RSD records which would yield about 1 million unique vehicle measurements for its program.

D. South Coast Air Quality Management District Light Duty Vehicle Remote Sensing, Repair, and Scrapping Program

The South Coast AQMD (District) is developing a "Light Duty Vehicle Remote Sensing, Repair, and Scrapping Program" funded under the provisions of AB 923. This program will be the first vehicle retirement program in California to incorporate the use of remote sensing. The District plans to identify high emitting vehicles using RSD supplemented with information in BAR's Smog Check database and the District's smoking vehicle database. The District will then contact vehicle owners to solicit their voluntary

participation. Eligible vehicles would receive either free or reduced emission-related repairs or be paid to voluntarily retire their vehicles.

The District's Governing Board has approved up to $4 million for the project. The District expects to collect about 3 million valid RSD records which would yield about 1 million unique vehicle measurements. The District plans to contact owners of the vehicles with the top 1 or 2 percent of the highest emissions and expects to repair or retire several thousand vehicles. The exact number is dependent on the degree of voluntary participation which is difficult to predict for a first of its kind program. The District plans to offer up to $500 per vehicle for repairs or $1,000 for retirement. An additional $1,000 would be offered to low income vehicle owners who replace their retired vehicle with one certified to a LEV or cleaner emission standard. The District expects the program to be operational in Fall 2006 and to run for about a year.

The District has selected several contractors to operate the program. Environmental Systems Products (ESP) will operate the remote sensing and high emitter identification element of the program. The Foundation for California Community Colleges (FCCC) will perform vehicle testing, diagnostic, and repair work as well as solicit participants. Pick Your Part will run the vehicle retirement element of the program.

In additional to identifying vehicles via RSD, the District will attempt to incorporate PM and evaporative emission measurements into the program. RSD does not directly measure either of these pollutants. The District proposes to use a new PM measurement device to measure PM emissions and identify high emitters. Also, the District plans to use the low pressure evaporative emission testing units currently being developed by BAR for the Smog Check program to identify vehicles with high evaporative emissions.

ARB staff is working with District staff in developing the program. As the first RSD-based retirement and repair program, it should provide valuable data that will help shape future programs.

II. Development of Proposed Revisions to VAVR Regulation

This section provides some background on how staff developed the proposed revisions to the VAVR regulation – describing the need for proposed modifications, goals and guiding principles, and the public outreach that was part of the regulatory development process.

A. Need for Proposed Modifications

The current VAVR regulation defines how a VAVR program must be operated and how emission reduction credits are quantified. The regulation does not require that a candidate vehicle's emissions be measured prior to retirement to estimate emission reduction credits. All retired vehicles are assumed to have the average emissions of its model year. The regulation includes a look up table of emission reductions by model

year based on the calendar year in which the vehicle is retired. The approach was endorsed by the Board when it adopted the regulation in 1998.

A broad range of stakeholders have expressed a strong interest in incorporating technologies such as RSD to identify the highest emitting vehicles for possible voluntary participation in retirement programs. Consistently, stakeholders have also requested that VAVR programs be permitted to generate extra emission reduction credits for retiring these high emitting vehicles.

The current regulation does not prohibit the use of RSD or other technologies to identify high emitting vehicles; it is silent on the issue. However, in practical terms, the regulation does not accommodate these approaches because it does not provide for the generation of extra emission reductions for retiring high emitting vehicles.

ARB staff agrees that revisions to the regulation are needed and is proposing to amend the VAVR regulation to authorize the use of RSD to identify high emitting vehicles and allow the generation of extra emission reduction credits for the retirement of these vehicles. Additionally, staff is proposing to allow other technologies such as high emitter profiles that can identify high emitting vehicles.

B. Goals for Proposed Regulatory Changes

In developing the proposed regulation, ARB staff focused on accomplishing four goals:

- Ensure consistency with the enabling legislation (Accelerated Light-Duty Vehicle Retirement Program, Health and Safety Code section 44100 et seq);
- Expand VAVR programs to include the use of technologies to identify high emitting vehicles for extra emission reduction credits;
- Increase flexibility to administer and operate VAVR programs while ensuring that emission reductions are real, surplus, quantifiable, and enforceable; and
- Improve the clarity and readability of the regulation.

C. Public Outreach

ARB staff conducted three workshops in support of the proposed VAVR regulatory revisions. [VAVR, 2006] In addition to addressing proposals to incorporate the identification of high emitting vehicles into VAVR programs, the workshops also addressed staff's related proposals for Carl Moyer Program Guidelines governing voluntary repair of vehicles programs. Notices of each workshop were sent to list serves established for the VAVR program and for the Carl Moyer Program. ARB also sent notices to Carl Moyer Program contacts at each local air district. In order to reach the largest audiences, workshops were webcasted when technically feasible.

Additionally, handouts and staff's presentations were made available in advance of the workshops to permit interested parties enough time to review the information.

At the first workshop in March 2006, ARB staff provided background on the rule making process, the current VAVR regulation, and the Carl Moyer Program. Staff also broadly discussed the goals of the proposed revisions and the questions which needed to be addressed. At the second workshop in June 2006, ARB presented draft regulatory and guidance concepts. During the third and final workshop held in August 2006, staff presented draft regulatory and guidance language. Staff encouraged stakeholders to provide verbal comments during each workshop and written comments after each workshop. Between each workshop, ARB staff considered the comments received and incorporated them into its proposals where appropriate.

Throughout the regulatory development process, ARB staff worked directly with stakeholders to refine its approaches and to respond to the concerns that were raised. During this process, staff met or communicated with representatives from the South Coast AQMD, San Joaquin Valley Air Pollution Control District, BAR, Specialty Equipment Market Association, the Clean Air Dialogue Working Group of the California Environmental Dialogue, Eastern Research Group, and ESP.

Not all concerns and alternative approaches proposed by stakeholders could be addressed in the regulation, as one approach sometimes was in direct opposition to another. Staff endeavored to craft a regulation that addressed as many issues as possible while retaining the goal of maintaining a balance between flexibility and the requirement that emission reductions from vehicle retirement be real, surplus, quantifiable, and enforceable.

III. Proposed Regulatory Changes

Staff's proposed changes to the regulations fall into several main categories:

- Establishing provisions for operating VAVR program that would use remote sensing or other technologies to identify high emitting vehicles for voluntarily participation.

- Revising the vehicle registration requirement from 120 days to 24 months to be consistent with State law.

- Revising the format of the emission reduction calculation for conventional VAVR programs to replace the emission reduction tables with the underlying formulas.

- Clarifying changes intended to improve the readability of the regulation and remove sections that are no longer relevant.

The proposed changes are described below along with staff's rationale for its proposals. Appendix A contains the proposed regulation order. Appendix B provides the section by section narrative details of the proposed changes to the regulatory language.

If the Board adopts staff's proposed changes, two types of VAVR programs would be allowed under the regulation. These are referred to in this document as "conventional VAVR programs" and "high emitter VAVR programs," respectively. Districts interesting in running VAVR programs would have the option of choosing which type of program to operate. Conventional VAVR programs are already authorized in the existing regulation and have been operated since the ARB first adopted the VAVR regulation. In these programs, any older vehicle may be retired provided it meets the minimum eligibility requirements. Emission reductions are achieved because these older vehicles, even ones that meet their Smog Check standards, emit more pollutants than the newer vehicles that replace them. Vehicles retired in these programs are typically 20 to 25 years old. A well maintained 20-25 year old vehicle emits on average 3 to 4 times as much as the average vehicle on the road.

In high emitter VAVR programs, remote sensing or other technologies are used to identify the highest emitting vehicles in the fleet for possible voluntary participation. These vehicles can have emissions more than 10 times greater than an average vehicle. By targeting only the highest emitting vehicles, the programs can achieve extra emission reductions relative to conventional VAVR programs. However, these programs are more expensive to operate. The South Coast's Light Duty Vehicle Remote Sensing, Repair, and Scrapping Program would be the first high emitter VAVR program.

A. Provisions for High Emitter VAVR Programs

ARB staff is proposing to modify the regulation to allow the optional use of remote sensing or other technologies to identify high emitting vehicles for participation in VAVR. The proposed revisions would authorize the generation of extra emission reduction credits for the retirement of vehicles identified as high emitters. Instead of providing prescriptive requirements for how high emitter VAVR programs must be run, the proposed regulation would provide a broader framework governing these programs. Because these are voluntary programs, ARB staff wanted to provide flexibility for local entities to design the programs that fit best for their local air quality problems.

The proposed regulation would not specify only one technology to identify high emitting vehicles. Instead the regulation specifies broad criteria for the approaches used to identify vehicles. They must be based on scientifically established technologies and must be able to identify the vehicles most likely to fail Smog Check. Programs could use RSD. Another approach would be using high emitting vehicle profiles. These predict the likelihood that a vehicle would fail its next Smog Checks based on parameters such as model year, vehicle make and model, and the vehicle's past Smog Check history. Staff wants to leave these decisions to those designing programs at the local level instead of prescribing one approach. This would also allow VAVR programs to evolve as new technologies become available or as current ones are refined without requiring regulatory revisions.

At the same time, safeguards must be built into the governing regulations to ensure that programs are technically sound and produce emission reductions that are real, surplus, quantifiable, and enforceable. To address this, ARB staff is proposing that a detailed plan detailing how the program would run be submitted to the ARB for approval in advance of starting a high emitter VAVR program. The proposed regulation specifies the elements that must be contained in the plan to ensure that a proposed program would be technically sound. These include, but are not limited to, descriptions of: how the high emitting vehicle VAVR program would be administered; the technology that would be used to identify high emitting vehicles; how that technology would be operated (such as standard operating procedures); and the criteria that would be used to select high emitting vehicles for voluntary participation.

The provisions for high emitter vehicle programs are contained in Sections 2608 (Emission Reduction Credits) and 2610 (Identification of High Emitting Vehicles) of the proposed regulation. See Appendices A and B for more detail.

Vehicles retired through high emitter VAVR programs would be eligible to generate extra emission reduction credits relative to those retired in conventional programs. For conventional VAVR programs, the regulation does not require that the retired vehicle's emissions be measured, so the emission reductions are based on the average emissions for each model year. A different calculation methodology is needed for high emitter VAVR programs which recognize that vehicles identified as high emitters would not have the average emissions of their model year.

VAVR program plans would need to include the calculation methodology that would be used to estimate emission benefits. ARB staff is proposing to place a recommended calculation methodology for estimating the emission reductions for high emitter VAVR programs in updates to the Carl Moyer Program Guidelines being considered concurrently with the proposed revision to the VAVR regulation. More details can be found in the ARB report, *The Carl Moyer Program Guidelines: Proposed 2006 Revision to Project Criteria for Light-Duty Vehicles,* dated October 20, 2006.

In the proposed guidelines, vehicles identified as possible high emitters would be given a confirmatory Smog Check test to establish their emissions. For the purposes of VAVR programs, a high emitting vehicle is defined as one that fails the confirmatory Smog Check test. Vehicles whose emissions are below the pass/fail Smog Check emission standard would not be considered a high emitting vehicles and would not be eligible for extra emission reductions. These vehicles could still be voluntarily retired and receive the emission reductions for conventional VAVR programs.

The proposed calculation approach provides one year of credit at the high emitter level, but the credit for remaining life would be lower, reflecting the fact that these vehicles would have failed their next Smog Check and been repaired had they remained on the road.

Although the focus of this report is the proposed revisions to the VAVR regulation, it should be noted that there is also interest in using these technologies to identify vehicles for voluntary repair programs. In its related guidelines for voluntary repair programs, ARB staff is proposing that possible high emitting be identified following the proposed provisions of the VAVR regulation.

Stakeholder input: Throughout the development of the proposed regulatory changes, stakeholders have divided into two distinct factions regarding the approaches to modifications. One faction requests that specific requirements be included in the regulations that detail how technologies must be applied. These stakeholders prefer that the regulation specify detailed parameters for the operation of RSD and that other technologies should not be allowed unless detailed parameters for their operation are specified. Further, the regulation should set strict limits on their scope of use. The other faction seeks greater flexibility in designing programs so that local concerns could be addressed. These stakeholders caution against taking "one-size-fits-all" approach.

Because these are voluntary programs and high emitter VAVR programs are still in the pilot, ARB staff wanted to provide as much flexibility as possible for local entities to design the programs that fit best for their local air quality problems and avoid being overly prescriptive. Staff recognized that specifying exactly how a program must operate might stifle these local programs' ability to evolve and to achieve real emission reductions. However, ARB staff was aware of the need to provide specific guidelines for administering and operating VAVR programs. To this end, ARB staff has provided significant flexibility in the regulation but will require that any proposed alternative approach be described in detail and technically justified in the program plan. The plan must be reviewed and approved by the ARB prior to implementing the program.

A few stakeholders have argued that high emitting vehicle retirement programs should be treated as a separate entity and that these programs fall outside the VAVR regulation. ARB staff does not agree; the enabling legislation clearly contemplates the use of technologies to identify high emitting vehicles in VAVR programs. Health and Safety Code Section 44109 states:

> The program shall include appropriate means to solicit vehicle owners, including mass mailings, media advertising, news coverage, and direct mail to owners of candidate vehicles, and may include high-emitting vehicles based on smog check or remote sensing or high-emitter profile information.

ARB staff believes that the guiding principles in the enabling legislation apply to all VAVR programs, including those aimed at retiring high emitting vehicles and that a single regulation is appropriate. The VAVR regulation contains provisions to ensure that emission reductions are real, surplus, quantifiable, and enforceable.

B. Vehicle Registration Requirement

When the VAVR regulation was first adopted in 1998, vehicles were required to have been registered for at least 24 months within the district in which the VAVR program operated. [ARB, 1998] In the 2002 regulatory revisions, this requirement was reduced from 24 months to 120 days to simplify program administration. [ARB, 2001] This change was made in error as it is in conflict with the enabling legislation for VAVR programs which specifies a 24 month registration requirement [Health and Safety Code Section 44094(a)]. Staff is proposing to return the registration requirement to 24 months, with provisions for short term lapses in registration or non operational status, matching the original requirements from the 1998 version of the regulation.

Stakeholder input: During regulatory development, some stakeholders requested that the regulation allow for the retirement of unregistered vehicles and/or tampered vehicles. ARB staff does not agree. Staff believes that including these vehicles in VAVR programs would include an unreasonable risk of fraud and that the program should not be set up to reward those who fail to comply with State laws and regulations governing vehicle registration and tampering. The enabling legislation specifically addresses this issue. Health and Safety Code Section 44106 states:

> The program shall include provisions for monitoring and preventing all forms of tampering or other forms of cheating, and shall effectively address "avoidance vehicles" such as nonregistered vehicles and vehicles lacking a sufficient inspection and maintenance history. If fraud is detected, the program shall include provisions for suspending all new transactions with the entity suspected of fraud until problems are corrected and revaluing all credits used to meet the emissions reduction requirements. Contracts with authorized entities shall include remedies in cases of fraud.

ARB staff recognizes the need to reduce emissions from all high emitting vehicles, including vehicles that have been tampered or are not registered, and staff will work with stakeholders to find the appropriate ways address these sources of emissions. However, the inclusion of unregistered vehicles or uncorrected, tampered vehicles in VAVR programs is beyond the scope and authority of this regulation.

C. Emission Reduction Calculations for Conventional VAVR Programs

When the Board adopted the VAVR regulation in 1998, the methodology for calculating emission reductions for conventional VAVR programs was described in the staff report. [ARB, 1998] The regulation included emission reduction look up tables based on that methodology. These tables are in Appendix B of the current VAVR regulation. The tables contain the emission reductions by model year for vehicles retired in a particular calendar year. This approach presents some challenges for program implementation moving into the future because the regulation currently only includes reduction tables for past calendar years. The tables must be recalculated for each new calendar year.

To prevent a situation where the regulation needs to be revised simply to update the emission reduction tables, ARB staff is proposing to replace the tables currently in the VAVR regulation with the underlying methodology from the 1998 staff report. This proposed change would not alter the calculation methodology. With this proposed change, the regulation would contain the formulas for calculating the emission benefits, and ARB staff would prepare a table of emission benefits for each new calendar year, and make the table publicly available via ARB's web site prior to the start of the calendar year. This would provide a central location for all districts, VAVR enterprise operators, and other stakeholders to find the emission benefits tables.

Table B-1 in Appendix B of this report presents the emission reductions for vehicles retired calendar years 2007 and 2008, calculated using the methodology outlined in the proposed regulation.

D. Additional Clarifying Changes

ARB staff is proposing to reorganize some of regulatory language to clarify and improve the readability of the regulation. Each of these proposed changes is described in greater detail in Appendix B to this report.

The proposed changes would reorder certain text within the regulation in order to consolidate related requirements and responsibilities. For example, Section 2609 of the regulation contains records and auditing provisions. Staff felt that some of the text within that section fit better under the Section 2602 (District Responsibility) or Section 2604 (Enterprise Operator Requirements) of the regulation because it related more directly to the responsibilities of air districts or VAVR enterprise operators. Staff is proposing to deleted that text from Section 2609 and move it to Sections 2602 and 2604.

Staff is also proposing minor spelling, grammatical, and organizational alterations throughout the regulation to improve clarity and internal consistency. For example, certain terms that do not appear in the regulation would be removed from the definitions section, and the definitions would be reordered to appear in alphabetical order. With the reordering of the text, the appendices to the regulation would appear in different order in the regulatory text, so staff is proposing to reorder the appendices to the regulation accordingly.

ARB staff is also proposing to remove two sections of the regulation that are no longer applicable. Section 2610 (Pilot Program) specifies the requirements for a pilot program conducted in 1998 and 1999. Because the pilot program has been completed, the section is no longer needed. Under staff's proposal, Section 2610 (Pilot Program) would be deleted in its entirety. A proposed new Section 2610 (Identification of High Emitting Vehicles) would contain the provisions governing high emitter VAVR programs described earlier in this report.

Section 2611 (Procurement of Credits for SIP Measure M1) specifies procedures for procuring emission credits to fulfill the car scrap measure in the 1994 SIP. Because funding never materialize for the measure and it has subsequently been removed from the SIP, the section is no longer needed in the regulation. Under staff's proposal, Section 2611 (Procurement of Credits for SIP Measure M1) would be deleted.

Staff is also proposing to revise Appendix A to the regulation, the Vehicle Functional and Equipment Eligibility Inspection Form. This form is used to document that vehicles have been inspected and comply with the vehicle eligibility requirements in Section 2603. When the regulation was last revised in 2002, some of the vehicle eligibility requirements were changed. However, the Vehicle Functional and Equipment Eligibility Inspection Form in Appendix A of the regulation was not updated to match the revised regulatory requirements. These proposed changes would update the form, so it reflects the requirements of Section 2603.

IV. Environmental and Economic Impacts

A. Air Quality

Emission reductions from retiring vehicles are real in that the regulation ensures vehicles are retired early. In addition, safeguards have also been included in the regulation to ensure emission reductions are surplus to BAR's Consumer Assistance Program. Vehicle retirement programs in California are strictly voluntary. The proposed regulatory changes do not require anyone to retire their vehicles and do not require any districts or enterprise operators to run VAVR programs. However, the proposed changes provide additional flexibility in designing programs in response to stakeholder interest in expanding VAVR opportunities. Consequently, we expect the proposed changes would lead to an expansion of VAVR programs in California which would result in additional emission benefits.

The number of VAVR programs and the number of vehicle owners who take advantage of these new opportunities to voluntarily retire their vehicles are not known at this time, so staff cannot estimate the exact air quality benefits. However, staff believes that real and surplus emission reductions of ROG, NOx, and PM will result from the expanded VAVR programs.

To provide an illustration of the magnitude of potential benefits, ARB staff has estimated the emission reductions that might be achieved in a high emitter VAVR program relative to a conventional VAVR program. Typical vehicles retired in conventional programs are between 20 and 25 years old. ARB staff used the emission reductions from retiring 22 year old vehicles (model year 1985 vehicles retired in 2007) shown in Table B-1 in Appendix B to provide an example of the benefits from a conventional program. The emission benefits of retiring 1,000 of these vehicles is shown in Table 2.

Without any "real world" data from high emitter programs, it is more of a challenge to estimate the benefits from these programs because staff does not yet know exactly how

high emitting the vehicles retired will be. To provide an order of magnitude estimate, ARB staff assumed a retired vehicle might be a model year 1985 vehicle with emissions at five times the Smog Check pass/fail emission standard concentrations. ARB staff used the calculation methodology from *The Carl Moyer Program Guidelines: Proposed 2006 Revision to Project Criteria for Light-Duty Vehicles* to estimate the emission reductions from retiring such a vehicle. This methodology accounts for the benefits of the Smog Check program to avoid double counting benefits. This example does not include any extra emission reductions from retiring vehicles which are high evaporative emitters. The emission benefits of retiring 1,000 of these high emitting vehicles is shown in Table 2.

Table 2
Comparison of Sample High Emitter and Conventional VAVR Programs

	ROG Benefits (total tons over 3 years)*	**NOx Benefits** (total tons over 3 years)*
Conventional VAVR Retirement of 1,000 average model year 1985 vehicles	46	29
High Emitter VAVR Retirement of 1,000 high emitting model year 1985 vehicles	110	67

*Credit life for VAVR is 3 years.

In the example shown, the benefits from the high emitter program are about two and a half times that of the conventional program. Some vehicle may be even higher emitting than this example and provide more reductions if retired; others may provide less. As noted in the section on the South Coast AQMD's high emitter retirement and repair program, the District will incorporate evaporative emission measurements into the program. This may provide even greater emission reductions than shown in this example. Once the South Coast program is up and running, staff should be able to provide a better comparison of the emission benefits of conventional and high emitter VAVR programs.

B. Economic

All VAVR programs are voluntary for air districts, businesses, and vehicle owners, and a positive economical impact is created. Vehicle owners and businesses will not participate in VAVR programs if it is not economically beneficial. Businesses including auto dismantlers and companies that operate equipment that identify potential high emitting vehicles that participate in VAVR programs will see an increase in business. Potentially, a low number of new jobs may be created due to this increase. Owners of older, more polluting vehicles will benefit in that a new market will be created for their vehicles. An eligible vehicle with a useful life that may have had little resale value would have a cash value as a result of the vehicle's retirement. In turn, newer vehicles may be purchased in part by the incentive received from retiring a vehicle. Individuals and

businesses selling the newer vehicles may benefit slightly by an expanded market for their vehicles.

Businesses that participate in VAVR programs in which marketable mobile source emission reduction credits are generated will benefit by the marketing and sale of these credits. Businesses that purchase these credits may benefit by delaying more costly capital expenditures for air pollution control equipment.

C. Environmental Justice

The ARB is committed to integrating environmental justice in all of its activities. On December 13, 2001, the Board approved "Policies and Actions for Environmental Justice," which formally established a framework for incorporating Environmental Justice into the ARB's programs, consistent with the directives of State law. Environmental Justice is defined as the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies. These policies apply to all communities in California, but recognize that environmental justice issues have been raised more in the context of low-income and minority communities.

The proposed regulatory changes are consistent with the ARB's environmental justice policy. ARB staff has encouraged those who administer and/or operate VAVR programs to consider including safeguards in VAVR programs to ensure that those who are economically challenged are encouraged to participate. As the environmental justice challenges can be unique, depending on location within the state, ARB staff is proposing to allow a great deal of flexibility and allow environmental justice issues to be addressed taking local concerns into consideration, but all VAVR program plans must include a description of how environmental justice issues will be addressed.

V. Alternatives

Staff has considered alternatives to the proposed VAVR regulation. The first alternative is to make no changes. If this alternative was chosen, remote sensing devices and other technologies could still be used to identify high emitting vehicles. Nothing in the current regulation prevents the use of these technologies. However, the current regulation does not authorize the generation of extra emission reduction credits, so districts or enterprise operators would not be able to claim the actual emission reductions achieved. This would stifle the development of these programs by making it difficult, if not impossible, to show that they are cost-effective. The extra expense of operating a program to identify high emitting vehicles could not be offset with an accurate reflection of the corresponding additional reduction in emissions. In addition, if there were no revisions to the current regulation, the regulation would not be consistent with the requirements of the authorizing legislation with respect to vehicle registration requirements.

ARB staff also considered more prescriptive requirements that would limit the application of technologies to identify potential high emitting vehicles and to mandate how emissions were to be calculated. This approach would be contrary to many of the stakeholders' interests but consistent with the wishes of some. Staff concluded that, because VAVR programs are strictly voluntary and that detailed plans are required before a high emitting vehicle VAVR program can be implemented, enough safeguards were in place to allow a degree of flexibility. In this way, local concerns regarding the type of technology that could be used and the best methods for calculating emission reductions could be addressed in proposed VAVR program plans.

Ultimately, ARB staff chose a balance between flexibility and providing specific requirement on the administration and operation of VAVR programs. It was staff's belief that this approach provided the greatest potential for emission reductions and provided safeguards to ensure that these reductions were real, surplus, quantifiable, and enforceable.

VI. Conclusions and Recommendation

The proposed changes to the VAVR regulation expand the opportunities to reduce air pollution from the retirement of a wider range of older, more polluting vehicles and from high emitting vehicles. Additionally, the proposed changes provide the flexibility requested by some stakeholders and increases the safeguards requested by others to ensure that programs are administered and operated in an effective manner and that emission reductions are real, surplus, quantifiable, and enforceable.

ARB staff recommends that the Board adopt the proposed changes to the VAVR regulation.

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