SUBCHAPTER 4.5

SOLID/HAZARDOUS WASTE MANAGEMENT

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4.5 SOLID/HAZARDOUS WASTE

4.5.1 INTRODUCTION

This subchapter identifies potential solid/hazardous waste impacts that may be generated by implementing the 2007 AQMP. The potential impacts to the generation of solid and hazardous waste associated with the implementation of the 2007 AQMP are described below.

The analysis of solid/hazardous waste impacts assumes that safety and disposal procedures required by various agencies in the state of California will provide reasonable precautions against the improper disposal of hazardous wastes in a municipal waste landfill. Because of state and federal requirements, some facilities are attempting to reduce or minimize the generation of solid and hazardous waste by incorporating source reduction technologies to reduce the volume or toxicity of waste generated, including improving operating procedures, using less hazardous or non-hazardous substitute materials, and upgrading or replacing inefficient processes.

4.5.2 2007 AQMP CONTROL MEASURES WITH SOLID/HAZARDOUS WASTE IMPACTS

Table 4.5-1 lists the 2007 AQMP control measures with potential adverse solid and hazardous waste impacts through the addition of materials requiring disposal.

4.5.3 SIGNIFICANCE CRITERIA

Impacts to solid/hazardous waste facilities will be considered significant if any of the following occur:

- Published national, state, or local standards relating to solid waste or litter control are exceeded.

- The generation and disposal of solid or hazardous waste, when combined with existing waste generation, exceeds the capacity of designated landfills.

TABLE 4.5-1

Control Measures with Potential Solid/Hazardous Waste Impacts

Control Measures	Control Measure Description (Pollutant)	Control Methodology	Solid/Hazardous Waste Impacts
MEASURES TO BE IMPLEMENTED BY THE SCAQMD			
FUG-04	Emission Reductions from Pipeline and Storage Tank Degassing	Vapor space exhaust to be vented to air pollution control device. Enhanced control technology; increased control efficiency; establish concentration limits; expand source categories (smaller tank, etc.).	Potential increases in solid and hazardous wastes due to potential use of carbon adsorption.
CMB-01	NOx Reductions from Non-RECLAIM Ovens, Dryers and Furnaces	Use low-NOx burners through retrofit or replacement.	Potential increases in solid waste due to burner replacement.
CMB-02	Further SOx Reduction RECLAIM	Identifies control approaches for (BARCT) for reduction in SOx allocation. SOx reduction controls (i.e., sulfur recovery, etc).	Potential increases in solid and hazardous waste associated with particulate control and additional sulfur.
CMB-03	Further NOx Reductions from Space Heaters	Establish more stringent emission limits for new space heaters through use of low-NOx burners and heat pumps.	Potential increases in solid waste due to burner replacement.
BCM-01	PM Control Devices (Baghouses, Wet Scrubbers, Electrostatic Precipitators, Other Devices)	Install continuous opacity monitor system or bag leak detection system for top process emitters. Baghouse filter; ventilation/hood systems.	Potential increases in solid/hazardous waste due to increased removal of PM.
BCM-03	Emission Reductions from Wood Burning Fireplaces and Woodstoves	Voluntary or mandatory wood burning curtailment during poor air quality. Prohibit burning of non-wood fuel (e.g., waste, garbage, etc.).	Potential increase in solid waste due to early retirement of equipment.
BCM-04	Additional PM Emission Reductions from Rule 444-Open Burning	Reduce PM emissions from open burning. Prohibit burns; alternatives to burn (chipping, grinding, composting, etc).	Potential increase in solid waste associated with increased grinding, composting, etc.
BCM-05	Emission Reductions from Under-fired Charbroilers	Stimulate technology for PM emissions from under-fired charbroilers.	Potential increase in solid waste due to early retirement of equipment.
MCS-01	Facility Modernization	Equipment retrofitted or replaced with BACT at end of a pre-determined lifespan or use of super compliant materials/process change.	Potential increase in solid/hazardous waste associated with control technologies (e.g., carbon adsorption, filters).

TABLE 4.5-1 (cont.)

Control Measures	Control Measure Description (Pollutant)	Control Methodology	Solid/Hazardous Waste Impacts
MCS-03	Energy Efficiency and Conservation	Provide incentives for businesses to use energy efficient equipment, early retirement of existing equipment.	Potential increase in solid waste due to early retirement of equipment.
MCS-04	Emissions Reduction from Greenwaste Composting	Develop BMPs for reducing PM10, VOC, and NH3.	Potential increase in solid waste control technologies (e.g., carbon adsorption, filters).
MCS-05	Emission Reductions Livestock Waste	Air pollution control devices for larger facilities, reductions from smaller facilities. (use of belt/drying system); enclosures; VOC/odor control (i.e. afterburner).	Potential increase in solid waste due to disposal of filters or catalyst from air pollution control equipment (e.g., carbon filter).
EGM-01	Emission Reductions from New or Redevelopment Projects	Mitigate impacts new/redevelop projects. Dust control; alternative fuel; diesel PM filter; low-emitting engines; low VOC coatings; energy conservation; mitigation fee.	Potential increase in solid/hazardous waste due to equipment replacement and additional air pollution control equipment.
MOB-02	Expanded Exchange Program	Expand lawn mower/leaf blower exchange programs. Low-emitting engines/electrical engines.	Potential increase in solid waste due to equipment replacement.
MOB-03	Backstop Measure for Indirect Sources of Emissions from Ports and Port-Related Facilities	Address emissions from stationary and mobile sources at ports and related facilities. PM filter/catalysts; use of non-diesel equipment (i.e., electrical, fuel cells, LNG, CNG, etc); alternative diesel fuel (i.e. low sulfur, emulsified, etc); hoods, shoreside power (SCR); vessel speed reduction.	Potential increase in solid/hazardous waste due to equipment replacement and additional air pollution control equipment.
MOB-05	AB939 Light-Duty Vehicle High Emitter Identification Program	Identification of high-emitting on-road light-duty vehicles.	Potential increase in solid waste due to accelerated vehicle replacement.
MOB-06	AB939 Medium-Duty Vehicle High Emitter Identification Program	Identification of high-emitting on-road medium- duty vehicles.	Potential increase in solid waste due to accelerated vehicle replacement.
MEASURES FOR SOURCES UNDER STATE AND FEDERAL JURISDICTION			
ARB-ONRD-02	Expanded BAR Vehicle Retirement and Mandatory Part Replacement	Promote permanent retirement of eligible vehicles through financial incentives. Propose mandatory parts replacement after mileage cap.	Potential increase in solid waste due to vehicle part replacement.

TABLE 4.5-1 (cont.)

Control Measures	Control Measure Description (Pollutant)	Control Methodology	Solid/Hazardous Waste Impacts
SCONRD-01	Accelerated Penetration of Partial Zero-Emission and Zero-Emission Vehicles	Focus on implementation of technologies capable of achieving partial zero-tailpipe emissions. Alt fuels; advanced technology (partial zero emitting vehicles); old battery disposal.	Potential increase in solid waste due to accelerated vehicle replacement.
ARB-ONRD-04 SCONRD-03	Cleaner In Use Heavy Duty Vehicles	Accelerate retrofits for vehicles, fleet modernization and enhanced screening and repair, including out-of-state vehicles.	Potential increase in solid waste due to early retirement of equipment.
SCLTM-01B	Enhanced Inspection and In-Use Emissions Tracking of Heavy-Duty Vehicles	Have CARB develop an expanded inspection and maintenance program for heavy-duty diesel vehicles. Testing; inspection; possible replacement.	Potential increase in solid waste due to vehicle or engine replacement.
ARB-ONRD-05 SCONRD-04	Further Emissions Reductions from Heavy-Duty Trucks Providing Freight Drayage Services	Retrofit or replace existing over-the-road trucks providing drayage services at marine ports, intermodal facilities, or warehouses.	Potential increase in solid waste due to accelerated vehicle or engine equipment replacement and additional air pollution control equipment.
ARB-OFFRD-04 SCOFFRD-01	Construction/Industrial Equipment Fleet Modernization	New off-road diesel engines meet more stringent emissions standards. Accelerated engine replacement/retrofit/repower; alternative fuels.	Potential increase in solid waste due to equipment replacement and additional air pollution control equipment.
ARB-OFFRD-05 SCOFFRD-06	Accelerated Turnover and Catalyst Based Standards for Pleasure Craft	By 2014 outboard engines and personal watercraft meets Tier 3 standard levels. Accelerated retirement/retrofit engines.	Potential increase in solid/hazardous waste due to accelerated engine replacement and additional air pollution control equipment.
OFFRD-03 ARB-OFFRD-06	More Stringent Exhaust Standards for Off-Road Recreational Vehicles	New emission standards and accelerated fleet turnover are proposed to reduce emissions from this category. Catalyst technology.	Potential increase in solid/hazardous waste due to accelerated equipment replacement and additional air pollution control equipment.
OFFRD-04 ARB-OFFRD-05 SCOFFRD-06	Evaporative Standards for Recreational Vehicles and Pleasure Craft	Retrofit and regulation would reduce evaporative emissions. New evaporative standards.	Potential increase in solid waste due to equipment replacement and additional air pollution control equipment.
ARB-OFFRD-02 SCOFFRD-03	Further Emission Reductions from Locomotives	Operating in the Basin to meet Tier 3 equivalent emissions by 2014. Accelerated replacement; control technology (SCR, PM filters, hybrid battery engines).	Potential increase in solid/hazardous waste due to engine replacement and additional air pollution control equipment (e.g., catalyst disposal).

TABLE 4.5-1 (cont.)

Control Measures	Control Measure Description (Pollutant)	Control Methodology	Solid/Hazardous Waste Impacts
ARB-OFFRD-01	Auxiliary Ship Engine Cold Ironing and Other Clean Technology. Cleaner Main Ship Engines and Fuel.	Reduce emissions from ships at berth cold ironing (electrical power) and other clean technologies. Further reduce emissions from main engines through added retrofits. Accelerate use of cleaner ships and rebuilt engines. Use low sulfur diesel fuel in main engines when operating within 24 nautical miles of shore.	Potential increase in solid/hazardous waste due to air pollution control equipment (e.g., catalyst disposal) and early retirement of equipment.
ARB-OFFRD-03	Clean Up Existing Commercial Harbor Craft	Require owners of existing commercial harbor craft to replace old engines with newer cleaner engines and/or add emission control technologies that clean up engine exhaust.	Potential increase in solid/hazardous waste due to air pollution control equipment (e.g., catalyst disposal) and early retirement of equipment.
SCOFFRD-02	Further Emission Reductions from Cargo Handling Equipment	Additional emission reductions from cargo handling equipment beyond the state regulation. Accelerated retirement/retrofit (i.e., catalysts, PM traps, alternative fuel-emulsified diesel).	Potential increase in solid/hazardous waste due to equipment replacement and additional air pollution control equipment.
SCLTM-02	Emission Reductions from Aircraft	Federal government to establish more stringent emissions for aircraft engines. New emission standards; cleaner fuel; emission fees	Potential increase in solid waste due to early retirement of equipment.
SCOFFRD-04	Emission Reductions from Airport Ground Support Equipment	Reduce airport ground support equipment emissions primarily through electrification and emission standards.	Potential increase in solid waste due to equipment replacement.
LONG TERM ("BLACK BOX") MEASURES			
SCLTM-01	Further Emission Reductions from On-Road Mobile Sources	Focus on implementation of technologies capable of achieving partial zero-tailpipe emissions. Alt fuels; advanced technology (partial zero emitting vehicles); old battery disposal.	Potential increase in solid waste due to accelerated vehicle replacement.

TABLE 4.5-1 (cont.)

Control Measures	Control Measure Description (Pollutant)	Control Methodology	Solid/Hazardous Waste Impacts
SCLTM-02	Further Emission Reductions from Off-Road Mobile Sources	Further Reductions from Off-Road Mobile Sources through 1) accelerated turn-over of existing equipment and vehicles and replacement with new equipment meeting the new engine standards; 2) retrofit of existing vehicles and equipment with add-on controls such as SCR; and 3) develop new engine standards (e.g., aircraft, ships)	Potential increase in solid waste due to accelerated vehicle replacement.

4.5.4 POTENTIAL SOLID/HAZARDOUS WASTE IMPACTS AND MITIGATION MEASURES

The goal of the 2007 AQMP is to improve air quality, some types of air pollution control equipment have the potential to create cross-media impacts. For example, removing pollutants from equipment exhaust streams may produce liquid or solid wastes that may require further treatment or disposal to POTWs or landfills, respectively. Specifically, hazardous and non-hazardous waste maybe generated by some types of air pollution control equipment such as electrostatic precipitators, carbon adsorption, oxidation devices, wet scrubbers, baghouse, and filtration equipment. Several control measures have been proposed in the 2007 AQMP which may require the use of these types of pollution control equipment (see Table 4.5-1). Solid waste impacts from these control measures are described in the following subsections.

<u>Spent Batteries from Electric Vehicles</u>

PROJECT-SPECIFIC IMPACT: The 2007 AQMP projects substantial penetration of fuel cell, electric and electric hybrid vehicles by 2023 as part of mobile source pollution control measures. The suggested federal and state control measures include additional requirements for Low Emission Vehicles and Zero Emission Vehicles. SCONRD-01 is expected to result in the introduction of about 2.5 million electric cars by 2020. The batteries that could power these vehicles have useful lives similar to or less than the life of a vehicle. Since some batteries contain toxic materials, the increased use of batteries may result in an incremental increase in solid/hazardous waste impacts. In addition, environmental impacts could occur if batteries were disposed of in an unsafe manner, such as illegal dumping or by disposal in an unlined landfill.

It is difficult to predict in detail what the battery and fuel cell technologies of the future will be. It is also difficult to predict how often batteries will need replacement as this mainly depends on the battery type, the nature, and duration of its use, etc. Currently most battery packs' useful life is about three years. Replacement cost for the batteries depends on the type and number of batteries, but could cost thousands of dollars (SCAQMD, 2003).

Most battery and fuel cell technologies currently employ materials that have high economic value and, therefore, are recyclable. Additionally, both regulatory requirements and market forces require or encourage recycling. The following is a brief listing of some of the more important Federal and California regulations that have created requirements or incentives for the proper disposal and recycling of EV battery packs:

- The federal Battery Act promulgated in 1996 requires that each regulated battery be labeled with a recycling symbol. NiCad batteries must be labeled with the words "NiCad" and the phrase "Battery must be recycled or disposed of properly." Lead-acid batteries must be labeled with the words "Lead," "Return," and "Recycle."

- Current California and federal regulations require ZEV manufacturers to take into account the complete life-cycle of car batteries and to plan for safe disposal and/or recycling of battery materials.

- The California Health and Safety Code does not allow the disposal of lead-acid batteries at a solid waste facility or on or in any land, surface waters, water courses, or marine waters. Legal disposal methods for used lead-acid batteries are to recycle/reuse the battery or to dispose of it at a hazardous waste disposal facility. A lead-acid battery dealer is required to accept spent batteries when a new one is purchased.

- California Public Resources Code requires state agencies to purchase car batteries made from recycled material.
- The Universal Waste Rule requires that spent batteries exhibiting hazardous waste characteristics and that are not recycled need to be managed as hazardous waste. This includes lead-acid and NiCad batteries.

Recycling of lead-acid and nickel-cadmium batteries is a well-established activity. Eighty percent of lead consumed in the United States is used to produce lead-acid batteries and the lead recovery rate from batteries is approximately 80 to 90 percent (the remainder is plastic and fluids, e.g., sulfuric acid). According to the Lead-Acid Battery Consortium, 95 to 98 percent of all battery lead is recycled.

Because most EV batteries are recycled, it is unlikely that the increase in battery use would significantly adversely affect landfill capacity in California. As mentioned earlier, electric batteries generally hold significant residual value, and 95 to 98 percent of all lead-acid batteries are recycled. In addition, the electric batteries that would power EVs are packaged in battery packs and cannot be as easily disposed of as a single 12-volt conventional vehicle battery. It should be noted that the increased operation of EVs associated with the implementation of the 2007 AQMP may actually result in a reduction of the amount of solid/hazardous waste generated in the SCAQMD's jurisdiction. EVs do not require the various oil and gasoline filters that are required by vehicles using internal combustion engines. Furthermore, EVs do not require the same type or amount of engine fluids (oil, antifreeze, etc.) that are required by vehicles using internal combustion engines. Used oil and antifreeze are considered hazardous wastes under California regulations.

Illegal or improper disposal of electric batteries could result in significant solid waste impacts by allowing hazardous wastes to be disposed in municipal landfill. Even though batteries are comprised of materials with economic value, the increase use of electric batteries may require efforts at preventing disposal of spent batteries in municipal landfills or via illegal dumping. Two lead-acid battery recycling facilities are located within the district, which helps to increase the potential for recycling of lead-acid batteries. The increased use of electric batteries will require greater efforts at preventing disposal of spent batteries in unlined municipal landfills or via illegal dumping. The potential impact of the additional illegal disposal of batteries is considered a potentially significant adverse impact.

PROJECT-SPECIFIC MITIGATION: Recycling of lead-acid and NiCad batteries is already a well established activity. Even though batteries are recyclable in principle, recycling is still not a certainty. Therefore, the following incentives will help ensure recycling.

SHW 1: Promote legislation that would require leasing, deposit or rebate programs for electric batteries. Leasing and rebate programs can both be effective measures to increase the rate of recovery of spent batteries, and both types of measures are already proven in practice. Deposit programs can also achieve the same goals.

SHW 2: Promote legislation that would require spent battery exchange for battery replacement. Require that ZEV service stations sell or install new batteries only on condition that they receive the spent batteries in exchange.

The above mitigation measures, in addition to existing recycling programs and requirements, are expected to minimize any increase battery disposal impacts to less than significant.

<u>Potential Solid Waste Impacts due to Air Pollution Control Technologies</u>

PROJECT-SPECIFIC IMPACT: Table 4.5-1 identifies those proposed control measures that may have potential project specific impacts on solid waste due to the addition of pollution control equipment that use filters, catalysts, etc., to collect and control pollutants, which may eventually need to be disposed and/or replaced. It is difficult to quantify the number of facilities that would employ these types of equipment, the rate of disposal necessary to maintain the equipment, type of waste generated by the equipment (i.e., hazardous or non-hazardous) and the timing by which these technologies would come into use. However, known control technology historically used is examined qualitatively in the following paragraphs.

Particulate matter collected on filters and from electrostatic precipitators or dust filters is expected to be small. Diesel particulate filters are estimated to collect about 10 to 150 grams of material per vehicle per year (CARB, 2002***)*** which is expected to be considered as hazardous waste. The amount of material collected from these types of control equipment is expected to be minor as described in the following paragraphs and could be handled within the capacity of existing disposal facilities.

The diesel PM10 filter system consists of a filter positioned in the exhaust stream designed to collect a significant fraction of the PM10 emissions while allowing the exhaust gases to pass through the system. Since the volume of PM10 generated by a diesel engine is sufficient to fill up and plug a reasonably sized filter over time, some means of disposing of this trapped PM10 must be provided. The most promising means of disposal is to burn or oxidize the PM10 in the filter, thus regenerating, or cleansing, the filter.

A complete filter system consists of the filter and the means to facilitate the regeneration if not of the disposable type. The exhaust temperature of diesel engines is not always sufficient to initiate regeneration in the filter. A number of techniques are available to bring about regeneration of filters. It is not uncommon for some of these various techniques to be used in combination. Some of these methods include:

- Using a catalyst coated on the filter element. The application of a base or precious metal coating applied to the surface of the filter reduces the ignition temperature necessary for oxidation of the particulate;

- Using a NOx conversion catalyst upstream of the filter to facilitate oxidation of NO to NO_2 which adsorbs on the collected PM10, substantially reducing the temperature required to regenerate the filter;

- Using fuel-borne catalysts to reduce the temperature required for ignition of the accumulated material;

- Throttling the air intake to one or more of the cylinders, thereby increasing the exhaust temperature;

- Using fuel burners, electrical heaters, or combustion of atomized fuel by catalyst to heat the incoming exhaust gas to a temperature sufficient to ignite the PM10;

- Using periodically compressed air flowing in the opposite direction of the PM10 from the filter into a collection bag which is periodically discarded or burned; and

- Throttling the exhaust gas downstream of the filter. This method consists of a butterfly valve with a small orifice in it. The valve restricts the exhaust gas flow, adding back pressure to the engine, thereby causing the temperature of the exhaust gas to rise and initiating combustion.

Based on the above considerations no significant adverse solid/hazardous waste impacts are anticipated to occur from the use of particulate traps.

State law requires hazardous waste generators to attempt to recycle their wastes before disposing them. OEHHA has implemented a hazardous waste exchange program to promote the use, reuse, and exchange of hazardous wastes. The program is designed to assist generators of hazardous wastes to recycle their wastes and encourage the reuse of the wastes. The DTSC also publishes a directory catalog of industrial waste recyclers annually so that industries will know where to buy, sell, or exchange their wastes.

PROJECT-SPECIFIC MITIGATION: No significant solid/hazardous waste impacts were identified for solid waste impacts due to air pollution control technologies as part of the 2007 AQMP because the amount of additional waste generated is small so no mitigation measures are required.

Carbon Adsorption

PROJECT-SPECIFIC IMPACT: Several control measures could encourage the use of carbon adsorption as air pollution control equipment including FUG-04, MSC-01, MCS-04, MCS-05, EGM-01, and MOB-03. The amount of solid waste, which may be generated by the carbon adsorption process would depend on the number of carbon adsorbers installed, the operating characteristics, and the frequency of carbon replacement. Most of the control measures have alternative methods of compliance, e.g., reformulation of materials, so that all facilities would not be expected to use carbon adsorption to comply.

If carbon adsorption systems are used, the amount of hazardous waste generated on an annual basis is expected to be minimal. Most activated carbon used in carbon adsorption control devices is reclaimed and reactivated, resulting in negligible impacts on solid waste disposal facilities. Activated carbon can have a useful lifetime of five to 10 years; however, the operating characteristics of the control device may result in a shorter lifetime.

Spent carbon is usually recycled and reused rather than disposed in landfills. Most facilities contract out with vendors that take the spent carbon and deliver regenerated carbon. Another alternative to the land disposal of regenerated carbon is to burn the spent carbon in a thermal incinerator. With thermal incineration, the organic materials contained in the carbon are oxidized to carbon dioxide, water, and in most cases, harmless combustion by-products. Incineration destroys the toxic constituents and significantly reduces the volume of carbon to be disposed of, thus reducing solid waste impacts. The disadvantage of incineration is that without additional add-on control devices, there may be an increase in criteria pollutant emissions. Therefore, the solid waste impacts resulting from the use of carbon adsorption are expected to be less than significant.

Further, it is not expected that carbon adsorption will be used in every case where it is listed as a control option. It is expected that facilities will continue to choose other more cost-effective options such as product reformulation to comply with control measures.

PROJECT-SPECIFIC MITIGATION: The following mitigation measure is included to ensure that solid waste impacts as a result of carbon adsorption do not cause significant impacts.

SHW3: Recycling and reusing activated carbon should be required to minimize the amount of spent carbon waste being transferred to landfills.

<u>Particulate Traps/Prefilters/Filter/HEPA Filters</u>

PROJECT-SPECIFIC IMPACT: A number of control measures in the 2007 AQMP could require the collection and disposal of additional particulate matter including BCM-01, MCS-01, EGM-01, MOB-03, ARB-ONRD-04/SCONRD-03, ARB-OFFRD-02/SCOFFRD-03, and SCOFFRD-02. These measures could result in increased collection of particulate matter that would then need to be disposed.

Baghouses, prefilters, filters, and HEPA filters collect particulate emissions from stationary and mobile sources of particulate emissions. These types of filtration control equipment can effectively remove particulate matter, including heavy metals, asbestos, as well as other toxic and nontoxic compounds. Polytetrafluoroethylene (PTFE) membranes or HEPA filters can increase a system's removal efficiency up to 99.9 percent. In general, as particulate size decreases, the surface area to volume ratio increases, thus, increasing the capacity of these filters to adsorb smaller particles (including hazardous materials). An increase in the use of membranes and filters may result in an incremental increase solid waste requiring disposal in landfills over what would be produced if the AQMP were not adopted. In some cases, the waste generated will be hazardous (e.g., the collection of toxic emissions). The increase in the amount of waste generated from the use of filters and the collection of additional particulate matter are expected to be small, because filtration control equipment is already used in practice or required by existing rules, especially for stationary sources. Control measures that may include filtration control equipment will generally require increased control efficiencies and/or better housekeeping and maintenance requirements for the filtration devices. As a result the incremental amount of material collected by filters is expected to be small. Further, the larger filters used in baghhouses are cleaned and reused so minimal additional waste would be expected from filters themselves. Therefore, the potential impacts of the use of additional filtration equipment on solid/hazardous waste generation are less than significant.

PROJECT-SPECIFIC MITIGATION: No significant solid/hazardous waste impacts were identified for solid waste impacts due to filtration control technologies as part of the 2007 AQMP so no mitigation measures are required.

Catalytic Oxidation

PROJECT-SPECIFIC IMPACT: The 2007 AQMP could result in the increased use of catalytic oxidation to control emissions. The following control measures could rely on catalytic oxidation technologies for emission control including EGM-01, ARB-ONRD-04/SCONRD-03, ARB-OFFRD-05/SCOFFRD-06, ARB-OFFRD-04/SCOFFRD-01, ARB-OFFRD-06, and OFFRD-10. Catalytic oxidation beds generally use a precious metal to aid in the combustion of air pollutants at relatively low temperatures. Catalytic oxidizers require periodic replacement of the catalyst bed. The expected life of the catalyst is approximately three to five years, depending on the concentration of materials and type of exhaust flows controlled. Metals used in the catalyst are generally recovered because they are made from precious and valuable metals (e.g., platinum and palladium). Metals can be recovered from approximately 60 percent of the spent catalyst generated from the operation of catalytic oxidizers (SCAQMD, 2003). These metals could then be recycled. The remaining material would most likely need to be disposed of at a hazardous waste landfill.

If the catalyst is not hazardous, jurisdiction for its disposal then shifts to local agencies such as regional water quality control boards or county environmental agencies. The RWQCB has indicated that if a spent catalyst is not considered a hazardous waste, it would probably be considered a Designated Waste. A Designated Waste is characterized as a non-hazardous waste consisting of, or containing pollutants that, under ambient environmental conditions, could be released at concentrations in excess of applicable water objectives, or which could cause degradation of the waters of the state. The type of landfill that the material is disposed at will depend upon its final waste designation. Due to the recycling of catalysts used in catalytic oxidation and the fact that this technology is not expected to be widely used because of cost, no significant impacts on waste disposal are expected.

PROJECT-SPECIFIC MITIGATION: No significant solid/hazardous waste impacts were identified for solid waste impacts due to catalytic oxidation control technologies as part of the 2007 AQMP so no mitigation measures are required.

Early Retirement of Equipment

PROJECT-SPECIFIC IMPACT: Control Measures BCM-03 includes as one means of compliance the replacement of wood burning appliances resulting in the early disposal of these appliances. CMB-01, MCS-03, EGM-01, MOB-02, MOB-03, ARB-ONRD-01, ARB-ONRD-02, SCONRD-01, ARB-ONRD-04, SCONRD-03, SCLTM-01, ARB-ONRD-05, SCONRD-04, ARB-OFFRD-04, SCOFFRD-01, ARB-OFFRD-02, SCOFFRD-03, SCOFFRD-06, ARB-OFFRD-06, ARB-OFFRD-03, SCOFFRD-02, SCLTM-02, OFFRD-12, and SCOFFRD-04 could result in the early retirement of equipment (e.g., burners, air pollution control equipment, (e.g., catalysts), lawnmowers, leaf blowers, on-road trucks and vehicles, off-road vehicles, gasoline fueled engines, diesel fueled engines, and aircraft engines). Solid waste impacts could occur since the older equipment or vehicle parts would be taken out of service in the district and scrapped and disposed of in district landfills.

Approximately 80 percent of a vehicle can be recycled and reused in another capacity. Batteries, catalytic converters, tires, and other recoverable materials (e.g., metal components) are removed and the metal components of the vehicle are shredded. The shredded material is then sent for recovery of metal content. Therefore, the amount of solid waste landfilled as a result of the proposed control measures would be relatively small since most of the parts being replaced have commercial value as scrap metal. Currently, there are a limited number of vehicles and parts that can be scrapped per year because of the limited number of scrapping and recycling facilities in the district. It is expected that diesel engines and lawn and garden equipment could also be recycled for metal content, or rebuilt and sold to other areas. It is expected that parts and equipment would be scrapped in the near future, regardless of the AQMP control measures as they are older vehicles or have older components. The primary solid waste impact is expected to be accelerated replacement and disposal of equipment and parts before the end of their useful life. Further, these control measures are not expected to mandate that older vehicle, engines, lawn and garden equipment, or other equipment be scrapped. The control measures are expected to allow a number of different control methods to comply with the required emission reductions. The most cost effective control measures would be expected to be implemented. Control measures that would require new equipment will generally require that retirement occurs as the life of the old equipment is exhausted and new equipment is put into service. Based on the above, the increase in solid waste is expected to be within the district's permitted capacity of over 100,000 tons per day so that no significant impacts would be expected.

The California Integrated Waste Management Act of 1989 (AB 939) requires cities and counties in California to reduce the amount of solid waste disposed in landfills and transformed by 25 percent by 1995 and by 50 percent by 2000, through source reduction, recycling and composting activities. Many cities and counties have not met the 20 percent waste reduction goals (see Table 4.5-2). The generation of additional waste in the 2007 AQMP could impact the abilities of cities and counties to further reduce wastes. However, as discussed above the increase in solid waste that is expected to be diverted to a landfill is small and many of the waste streams are recyclable. Therefore, the proposed project is not expected to have adverse impacts on landfills.

PROJECT-SPECIFIC MITIGATION: No significant impacts on solid/hazardous waste associated with the early retirement of equipment were identified so no mitigation measures are required.

TABLE 4.5-2

Summary of Source Reduction Compliance

Location	Number of Jurisdictions	Jurisdictions at 25 % or greater compliance	Jurisdictions at 50 % or greater compliance
State of California	421	390	177
Los Angeles County	74	69	30
Orange County	35	35	15
Riverside County	25	23	8
San Bernardino Co.	25	24	9

Source: www.ciwmb.ca.gov/LGTools/MARS/JurDrSta.asp, February, 2007

4.5.5 SUMMARY OF SOLID/HAZARDOUS WASTE IMPACTS

The following is the summary of the conclusions of the analysis of solid/hazardous impacts associated with implementation of the 2007 AQMP.

- Spent Batteries: The analysis indicates that the solid/hazardous waste impacts associated with spent batteries were potentially significant. Mitigation measures were developed that are expected to minimize any increase in illegal disposal of batteries by requiring the exchange of old batteries for new batteries and reducing the potential for increased illegal disposal to less than significant.

- Solid Waste Impacts due to Air Pollution Control Technologies: No significant solid/hazardous waste impacts were identified for solid waste impacts due to short-term air pollution control technologies as part of the 2007 AQMP.

- Carbon Adsorption: The solid/hazardous waste impacts associated with the use of carbon adsorption are considered less than significant, after mitigation. Spent carbon is usually recycled and reused rather than disposed in landfills. Therefore, the overall impacts on solid/hazardous waste from carbon adsorption are expected to be less than significant.

- Particulate Traps/Prefilters/Filters/HEPA Filters: The increase in the amount of waste generated from the use of filters and the collection of additional particulate matter from the control measures are expected to be small as the amount of material collected is small.

- Catalytic Oxidation: The impacts associated with catalytic oxidization due to implementation of the control measures were not expected to be significant. Due to the recycling of catalysts used in catalytic oxidation, no significant impacts on waste disposal are expected.

- Early Retirement of Equipment: Control measures that would require new equipment will generally require that retirement occurs as the life of the old equipment is exhausted and new equipment is put into service. Further, the old equipment can be reused in locations outside the district or recycled for metal content. Therefore, no significant solid/hazardous waste impacts were identified due to implementation of the control measures.