Appendix E

AB 32 Requirements and Criteria

Appendix E

AB 32 Requirements and Criteria

This appendix provides a discussion of why staff believes the proposed regulation meets the limited criteria applicable to discrete early action measures, as well as furthers the later requirements of State law applicable to GHG measures generally.

- **The State Board shall adopt rules and regulations in an open public debate process to achieve the maximum technologically feasible and cost effective greenhouse gas emission reduction from sources or categories of sources.**

  Staff developed the proposed regulation to reduce methane emissions from MSW landfills in consultation with stakeholders in an open, public process through three public workshops and seven landfill workgroup meetings. See Chapter V of this report for additional details.

  The proposed regulation is technologically feasible and is similar to existing federal and district landfill gas rules for NMOCs and VOCs. It was developed based on information obtained from ARB's landfill inventory, and from discussions with representatives from industry, federal, State, and local agencies, and environmental organizations. Many MSW landfills that are already using gas collection and control systems to minimize NMOC emissions are familiar with the requirements in the proposed regulation, except in the areas of enhanced surface emissions monitoring, component leak testing, and methane destruction efficiency requirements for the control devices. Control devices that are subject to and complying with existing federal requirements for MSW landfills would meet the destruction efficiency requirements for methane in the proposed regulation. A detailed discussion of requirements of the proposed regulation is included in Chapter V.

  The proposed regulation is cost-effective, with an estimated cost-effectiveness of about $9 per metric ton of CO_2E reduced. The cost estimates used to calculate the cost-effectiveness are based on discussions with industry, local air districts, CIWMB staff, and landfill gas control equipment manufacturers. A detailed discussion of the economic impacts is included in Chapter VII.

- **Design the regulations, including the distribution of emissions allowances where appropriate, in a manner that is equitable, seeks to minimize costs and maximize the total benefits to California, and encourages early action to reduce greenhouse gas emissions.**

  The proposed regulation was designed to achieve the maximum GHG reduction benefit while minimizing the cost to the affected industry. Data on 367 landfills known to contain waste that is biodegradable was provided by CIMWB and used to develop ARB's landfill inventory. The landfill inventory was used to develop

requirements for MSW landfills that considered the landfill's size, age, methane generation rate, and ability to support the continuous operation of a gas control device without the use of supplemental fuel, and the ability to reduce emissions in a cost-effective manner.

In order to exclude landfills that are not likely to generate landfill gas in sufficient quantities to be collected and controlled (e.g., older, closed landfills or low emission landfills located in arid areas of the state), the proposed regulation establishes thresholds for landfill size, landfill gas heat input capacity (or methane generation flow rate). In addition, the proposed regulation applies only to MSW landfills that received (or will receive) solid waste after January 1, 1977. Hazardous waste landfills and landfills containing only inert waste, like ash and masonry from demolition sites, are exempt.

To further reduce costs to MSW landfill owners and operators, the proposed regulation contains an incentive to increase the walking space pattern (from 25 feet to 100 feet) if there are no exceedances of the surface emissions standards after four consecutive monitoring periods. In addition, closed or inactive MSW landfills would be allowed to decrease their surface monitoring from quarterly to annually.

- **Ensure that activities undertaken to comply with the regulations do not disproportionately impact low-income communities.**

  The decrease in methane emissions will occur statewide where MSW landfills are located, which is typically far from residential areas. Any residents living near a MSW landfill will receive the benefit of lower GHG emissions; lower exposure to toxic contaminants and odorous compounds contained in landfill gas, as well as a potential decrease in possible explosions caused by offsite gas migration.

- **Ensure that entities that have voluntarily reduced their greenhouse gas emissions prior to the implementation of this section receive appropriate credit for early voluntary reductions.**

  The proposed regulation provides labor-saving incentives for landfills that can demonstrate compliance with the surface emission standards for four consecutive quarters (see Chapter V). However, there are a few landfills which may be able to demonstrate that they have been compliant with the surface emission standards for the previous three years. The proposed regulation allows these landfills to take advantage of the labor-saving incentives when the regulation becomes effective if the appropriate documentation can be provided.

- **Ensure that activities undertaken pursuant to the regulations complement, and do not interfere with, efforts to achieve and maintain federal and state ambient air quality standards and to reduce toxic air contaminant emissions.**

The proposed GHG emissions limits are not expected to cause an increase in the emissions of criteria pollutants or toxic air contaminants (TAC) with the possible exception of a slight increase in oxides of nitrogen (NO_x) emitted from certain types of gas control devices such as internal combustion engines (IC engines). The proposed regulation will not interfere with local air district requirements for controlling VOC and TAC emissions from MSW landfill operations because GHG emission limits are not required by local air district rules and the control technologies are complementary.

- **Consider cost-effectiveness of these regulations.**

  The cost-effectiveness of the proposed regulation is about $9 per metric ton of CO_2E reduced, which is equivalent to an increase of about 10 cents per month to the waste disposal cost per California household. See Chapter VII and Appendix F for further discussion.

- **Consider overall societal benefits, including reductions in other air pollutants, diversification of energy sources, and other benefits to the economy, environment, and public health.**

  The proposed requirements for MSW landfills are not expected to cause any significant adverse impacts to society or the environment. California will benefit from the reduction of methane emissions. The proposed regulation will not cause a significant increase in VOC or TAC emissions, however, a slight increase in NO_x emissions may occur in the unlikely event a landfill owner or operator selects an IC engine for gas control and energy recovery purposes. ARB staff has concluded that no adverse environmental impacts should occur from adoption of and compliance with the proposed regulation.

  Reducing methane emissions from MSW landfills will also remove NMOCs that would have otherwise been emitted. The potential benefits of the proposed regulation on reducing explosive gas migration, odors, and water quality impacts have not been quantified. See Chapter VI for further discussion.

- **Minimize the administrative burden of implementing and complying with these regulations.**

  The administrative burden to landfill owners or operators complying with the proposed regulation is reduced by minimizing duplication of reporting efforts. For reporting purposes, owners or operators may submit equivalent documents (e.g., district permits or compliance plans) in place of the documents required in the proposed regulation provided that they contain the necessary information required by the proposed regulation and the information is clearly identified in the equivalent documents. ARB staff expects that most local air districts will request delegation from ARB to implement and assist with the enforcement of the proposed regulation and incorporate that effort in conjunction with their existing landfill programs.

Additionally, ARB is developing a landfill gas tool to assist owners and operators in estimating their landfill's fugitive methane emissions, potential landfill gas generation rate, and landfill gas heat input capacity.

- **Minimize leakage.**

  Leakage occurs when an emission limit set by the State causes manufacturing or other activities and their associated GHG emissions to be displaced outside of California. If leakage were to occur, jobs and other economic benefits to California would be lost. No leakage is expected from the proposed regulation. ARB staff believes that the regulation would not create a situation where MSW landfills located in California would be placed in a competitive disadvantage compared to MSW landfills located out-of-state. In most cases, it is infeasible to transport wastes very long distances.

- **Consider the significance of the contribution of each source or category of sources to statewide emissions of GHGs.**

  In California, MSW landfills are the second largest anthropogenic source of methane (ARB, 2009). ARB staff estimates that fugitive emissions of methane from MSW landfills represent about 1 percent of the statewide gas GHG inventory. The total projected reductions that will be achieved from landfills subject to the proposed regulation are about 1.2 $MMTCO_2E$ in 2010, 1.4 $MMTCO_2E$ in 2015, and 1.5 $MMTCO_2E$ in 2020. While this reduction is somewhat modest, it is necessary in order to achieve the long-term GHG emission reduction goals. When the reduction is considered in conjunction with current and future GHG emission reductions in other sectors, the total reductions are significant.

- **The GHG gas emissions reductions achieved are real, permanent, quantifiable, verifiable and enforceable by the state board.**

  ARB staff believes that the emissions and emission reductions for MSW landfills operations are real. The emissions and emission reductions were determined using the Mathematically Exact First-Order Decay model from the 2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines (IPCC, 2006) and through landfill surveys requesting site-specific landfill gas collection data from landfill owners and operators. The GHG reductions are verifiable through annual reporting and recordkeeping requirements included in the proposed regulation. These requirements also support enforcement efforts. Sources installing gas control devices to comply with the proposed regulation are also subject to local air district permitting requirements. Once the proposed regulation is approved by the Office of Administrative Law, the proposed regulation will become State law and enforceable by the Board.

- **For regulations, the reduction is in addition to any GHG emission reduction otherwise required by law and regulation, and any other greenhouse gas emission reduction that otherwise would occur.**

  The proposed regulation for reducing methane emissions from MSW landfills is the first GHG regulation affecting this industry. No other local, State, federal, or other requirements, specific to reducing methane emissions from MSW landfills in California, are known to exist. While there are federal and local requirements applicable to MSW landfills, the proposed state regulation demonstrates GHG emission reductions beyond what can be expected from existing requirements.

- **If applicable, the GHG emission reduction occurs over the same time period and is equivalent in amount to any direct emission reduction required pursuant to this division.**

  This requirement is not applicable to the proposed regulation for MSW landfills because it achieves its emission reductions as direct reductions.

- **The state board shall rely upon the best available economic and scientific information and its assessment of existing and projected technological capabilities when adopting the regulations required by the law.**

  ARB staff used the best available economic and scientific information to develop the proposed regulation for reducing methane emissions from MSW landfills. Chapter VII includes a detailed description of the economic impacts of the proposed regulation. Chapter III discuses the management of MSW, the methane generation process, methods for optimizing collection efficiencies, and control technologies for reducing methane emissions from MSW landfills.