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EL CENTRO, CA 92243-2850

TELEPHONE: (760) 482-4606  
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March 30, 2012

**CERTIFIED MAIL**

Attn: James Ryden  
Chief of the Enforcement Division  
CA Air Resources Board  
1001 "T" Street  
P.O. Box 2815  
Sacramento, CA 95812

**Re: MOU between CA Air Resources Board and the Imperial County Air Pollution Control District for Implementation and Enforcement of Regulation to Reduce Methane Emissions from Municipal Solid Waste Landfills**

Dear Mr. Ryden:

Enclosed is a Minute Order and two copies of the MOU between the County of Imperial and CA Air Resources Board which was approved by the Board of Supervisors on March 20, 2012. Please sign both copies and return one original.

If you have any question please do not hesitate to contact me at (760) 482-4606.

Thank You

Brad Poiriez  
Air Pollution Control Officer

**MINUTE ORDER  
OF  
AIR POLLUTION  
CONTROL BOARD**

Date: March 20, 2012	Book: 405	Page: 378	File #: 300.12	M.O.#: 17
X-File 1:	X-File 2:	X-File 3:	X-File 4:	
Department: APCD		2nd Page:		

THE BOARD OF SUPERVISORS OF THE COUNTY OF IMPERIAL, STATE OF CALIFORNIA, on a motion by Supervisor : RENISON , second by Supervisor : WYATT and approved by the following roll call vote;

**AYES :** RENISON, TERRAZAS, KELLEY, WYATT, CASTILLO

**NAYES :** NONE

**ABSTAINED :** NONE

**EXCUSED OR ABSENT :** NONE

**IN REFERENCE TO :**

Approve and authorize the Chairman of the Air Pollution Control Board to sign Memorandum of Understanding with the California Air Resources Board (CARB) to implement and enforce the CARB Regulation to reduce emissions of methane and greenhouse gases from municipal solid waste landfills.

<b>Topic:</b> MOU	<b>X-Topic:</b> Ca. Air Resources Board (CARB)
<p>CC: <input checked="" type="checkbox"/> File      <input type="checkbox"/> Behavioral Health    <input type="checkbox"/> Health      <input type="checkbox"/> Sheriff-Coroner  <input checked="" type="checkbox"/> APCD      <input checked="" type="checkbox"/> CEO            <input type="checkbox"/> ICCED      <input type="checkbox"/> Social Services  <input type="checkbox"/> Assessors    <input type="checkbox"/> County Counsel    <input type="checkbox"/> Planning    <input type="checkbox"/> Other...  <input checked="" type="checkbox"/> Auditor      <input type="checkbox"/> County Property    <input type="checkbox"/> Public Works</p>	

**MEMORANDUM OF UNDERSTANDING  
BETWEEN  
THE CALIFORNIA AIR RESOURCES BOARD  
AND THE  
IMPERIAL COUNTY AIR POLLUTION CONTROL DISTRICT  
REGARDING  
IMPLEMENTATION AND ENFORCEMENT OF REGULATION  
TO REDUCE  
METHANE EMISSIONS FROM MUNICIPAL SOLID WASTE LANDFILLS**

**1 PARTIES**

This Memorandum of Understanding is entered into by and between the California Air Resources Board ("ARB" or "Board") and the Imperial County Air Pollution Control Air District ("District"). ARB and the District are collectively referred to herein as "the Parties."

**2 PURPOSE**

- 2.1 The Parties, two government agencies, share a common goal of protecting the People of the State of California through regulation and enforcement of air pollutant emission reductions. In entering into this Memorandum of Understanding ("MOU"), the Parties commit to efficiently pursuing this common goal, considering their respective financial constraints and available resources.
- 2.2 The Parties recognize that a municipal solid waste landfill is a unique stationary source that is very different from other sources regulated under the California Global Warming Solutions Act of 2006 (Chap. 488, Stats. 2006) as codified in Health and Safety Code Division 25.5, sections 38500 et seq. (Assembly Bill 32, "AB 32"). This is in part because Districts have been implementing and enforcing federal and local requirements for municipal solid waste landfills since the mid-1980s in furtherance of their primary authority for issuing permits to, and reducing emissions from, stationary sources, including landfills, that emit air pollutants. The Parties believe this MOU is appropriate to implement and enforce the ARB greenhouse gas rule for municipal solid waste landfills.
- 2.3 This MOU is intended to: (1) provide for the coordination of the Parties' efforts to implement and enforce the Regulation to Reduce Methane Emissions From Municipal Solid Waste Landfills, as considered by the Board and effective on June 17, 2010 (hereinafter "ARB Landfill Regulation"); and, (2) further a collaborative model that builds upon the Parties' extensive implementation and enforcement experience.
- 2.4 Nothing in this MOU shall limit the existing authority of the District.

### 3 BACKGROUND

- 3.1 Powers of ARB. Pursuant to California Health and Safety Code section 39603, ARB may enter into agreements for services as necessary for the performance of its powers and duties, including powers and duties arising under AB 32.
- 3.2 Powers of District. Pursuant to California Health and Safety Code section 40701, the District may enter into agreements with a state agency as necessary or proper to accomplish the purposes of Division 26 of the Health and Safety Code. One such purpose is for the District to enter into an MOU with ARB in order to coordinate enforcement of ARB's Landfill Regulation adopted pursuant to AB 32.
- 3.3 Responsibilities Under State Law. Under California law, ARB is the state agency charged with monitoring and regulating sources of emissions of greenhouse gases that cause global warming in order to reduce emissions of greenhouse gases (Health and Safety Code § 38510), and ARB is to monitor compliance with and enforce any regulation it adopts pursuant to AB 32 (Health and Safety Code § 38580). Pursuant to Health and Safety Code sections 39002 and 40000, district's primary responsibility for control of air pollution from all sources other than vehicular sources; and, pursuant to Health and Safety Code section 40001, districts shall, subject to the Board's powers and duties, enforce all applicable provisions of state and federal law.
- 3.4 Coordinated Effort. In Health and Safety Code section 39001, the Legislature declares that a coordinated state, regional, and local effort to protect and enhance ambient air quality should be encouraged whenever possible. In Health and Safety Code section 38501, the Legislature stated its intent for the Board to design greenhouse gas emission reduction regulations to complement the state's efforts to improve air quality and to consult with various stakeholders in implementing AB 32.
- 3.5 The AB 32 Scoping Plan and Early Action List
  - 3.5.1 In June 2007, pursuant to Health and Safety Code § 38560.5, the Board identified a measure to reduce methane emissions from municipal solid waste landfills as a discrete early action measure.
  - 3.5.2 On August 24, 2010, pursuant to Health and Safety Code § 38561, the Board reapproved a Climate Change Scoping Plan for achieving greenhouse gas emission reductions from many sources, including from municipal solid waste landfills.
    - 3.5.2.1 Board Resolution 08-47 adopting the Climate Change Scoping Plan directed ARB's Executive Officer to "design greenhouse gas regulations that affect stationary sources so that they utilize, to the extent practical and appropriate, local air district

permitting programs and compliance determination mechanisms.”

- 3.6 ARB Landfill Regulation. In implementing its plans and carrying out its responsibilities under state law, the Board has adopted the “Regulation to Reduce Methane Emissions from Municipal Solid Waste Landfills,” effective in final form on June 17, 2010. The adopted regulations are set forth at California Code of Regulations, title 17, sections 95460 through 95476, and Appendix I thereto.
- 3.6.1 California Code of Regulations, title 17, section 95473, explicitly provides ARB's Executive Officer with the discretion to enter into an agreement with any air quality management or air pollution control district (“district”) to implement and enforce the ARB Landfill Regulation.
- 3.6.2 Section 95473 further requires that District implementation and enforcement of other law as described in Section 95474 cannot result in a standard, requirement, or prohibition less stringent than provided in the regulation, as determined by ARB's Executive Officer.
- 3.6.3 Section 95473 further requires that District implementation and enforcement of other law as described in Section 95474 cannot result in a standard, requirement, or prohibition less stringent than provided in the regulation, as determined by ARB's Executive Officer.
- 3.6.4 ARB Board Resolution 09-38, directs ARB staff to work with Districts to develop and consider agreements with Districts to implement and enforce the ARB Landfill Regulation.
- 3.7 Legal Authority for ARB Regulations. ARB's authority for adopting the Landfill Regulation is one or more AB 32 provisions providing ARB authority to adopt rules and regulations to achieve maximum technologically feasible and cost-effective reductions in greenhouse gas emissions from sources or categories of sources. These AB 32 provisions include, but are not limited to, Health and Safety Code section 38560.5(c).
- 3.8 Enforcement Authority
- 3.8.1 ARB Enforcement Authority
- 3.8.1.1 Health and Safety Code section 39515 directs the Board to appoint an Executive Officer, who shall serve at the pleasure of the Board, and provides that the Board may delegate any duty to the Executive Officer that the Board deems appropriate, except that certain statutory reviews by the Executive Officer of district attainment plan activities are subject to the California

Administrative Procedure Act, Government Code sections 11340 et seq.

- 3.8.1.2 Health and Safety Code section 39516 provides that any power, duty, purpose, function, or jurisdiction which the Board may lawfully delegate shall be conclusively presumed to have been delegated to the Executive Officer unless it is shown that the Board, by affirmative vote recorded in its minutes, specifically has reserved the same for the Board's own action.
- 3.8.1.3 Resolution 78-10, adopted by the Board on February 23, 1978, identifies powers, duties, purposes, functions and jurisdictions that the Board has specifically reserved unto itself.
- 3.8.1.4 Enforcement of ARB regulations is not a power or function that the Board has specifically reserved to itself under Resolution 78-10 or Resolution 05-40 and is therefore conclusively presumed to have been delegated to the ARB Executive Officer.
- 3.8.1.5 In carrying out ARB enforcement responsibilities, the ARB Executive Officer may delegate the performance of ministerial tasks, including the investigation and determination of facts preliminary to agency action. (*California School Employees Assn. v. Personnel Com. of Pajaro Valley Unified School Dist.* (1970) 3 Cal.3d 139.)

### 3.8.2 District Enforcement Authority

- 3.8.2.1 Pursuant to Health and Safety Code section 40001, the District shall enforce rules and regulations, including applicable state and federal law, subject to the powers and duties of the Board.
- 3.8.2.2 Pursuant to Health and Safety Code section 40752, the Air Pollution Control Officer ("APCO") of each district shall enforce Parts 3 and 4 of Health and Safety Code Division 26 (§§ 10000 -41357, and 41500 41708, respectively) as well as all orders, regulations, and rules prescribed by the district's governing board.
- 3.8.2.3 Pursuant to Health and Safety Code sections 39013, 38594, 40702, and 42300, and *Western Oil & Gas Association v. Monterey Bay Air Pollution Control District* (1989) 49 Cal.3d 408, The District has independent authority to adopt, implement, and enforce local landfill rules and regulations that are as stringent or more stringent than those in the ARB Landfill Regulation.

3.8.2.4 Imperial County Air Pollution Control District has not adopted a local landfill rule, and seeks to implement and enforce the ARB Landfill Regulation pursuant to this MOU.

### 3.9 Need for Implementation and Enforcement of ARB Regulations

- 3.9.1 Most Districts in California have previously established and have ongoing regulatory control over landfills in their district. Districts, including the Imperial County Air Pollution Control District have historically regulated municipal solid waste landfills under local district rules implementing federal New Source Performance Standards (NSPS) and Emission Guidelines (EG) (40 CFR Part 60 Subparts WWW and Cc) for MSW landfills, and National Emission Standards for Hazardous Air Pollutants (NESHAP) for municipal solid waste ("MSW") landfills (40 CFR Part 63 Subpart AAAA). Many districts, including the Imperial County Air Pollution Control District, also issue air pollution control permits to construct and operate landfill gas collection systems and control equipment used at landfills. Some districts, including the Imperial County Air Pollution Control District, have their own rules that apply smog reduction requirements more stringent than federal NSPS or NESHAP.
- 3.9.2 The ARB Landfill Regulation builds on many of the same methane collection and control, component leak testing, and surface emissions monitoring requirements identified in 3.9.1 that districts were already implementing and enforcing.
- 3.9.3 Compliance with the ARB Landfill Regulation is necessary to achieve additional significant reductions in greenhouse gas emissions or to reduce redundant reporting and enforcement from sources within the Imperial County Air Pollution Control District, toward ensuring that statewide emission reductions are achieved as expected from this regulation to meet the 2020 statewide greenhouse gas limits.

## 4 AGREEMENT

### 4.1 Implementation and Enforcement of the ARB Landfill Regulation

- 4.1.1 The Parties hereby agree to the following in order to coordinate enforcement efforts and roles, and to authorize the District to exercise certain duties and discretion of the ARB Executive Officer regarding the ARB Landfill Regulation.

- 4.1.1.1 In implementing and enforcing the ARB Landfill Regulation, the District will perform the functions necessary to determine a source's compliance, including, but not limited to, receiving and reviewing relevant source plans and reports and conducting investigations.
- 4.1.1.2 In implementing and enforcing the ARB Landfill Regulation, the District's Air Pollution Control Officer (or delegate by operation of law including any District rule) serves as the "Executive Officer" as stated in said ARB Landfill Regulation.
- 4.1.1.3 The District may perform one or more of the implementation and enforcement tasks identified in this section 4.1 in conjunction with exercising other District powers or fulfilling other District responsibilities under federal, state, or local law.
- 4.1.2 The District will issue Notices of Violation (NOV) or other citations for violations of any of the ARB Landfill Regulation as well as to any subsequent amendments thereto.
- 4.1.3 ARB hereby authorizes the District to review and approve alternative compliance options to the compliance regulations, monitoring requirements, test methods and procedures of Sections 95464, 95469, and 95471 of the ARB Landfill Regulation.
- 4.1.4 ARB hereby authorizes the District to review and determine the applicability of the ARB Landfill Regulation, including any exemptions thereto in accordance with sections 95461, and 95462 of the ARB Landfill Regulation.
- 4.1.5 ARB retains enforcement authority to enforce the ARB Landfill Regulation, and this MOU shall not be interpreted to diminish in any manner ARB authority to enforce its regulations, either alone or jointly with the District.
- 4.1.6 This authorization shall not be interpreted to impose upon the District any obligation to enforce the ARB Landfill Regulation.
- 4.1.7 The District retains enforcement authority to enforce any duly adopted local landfill rule, and this MOU shall not be interpreted to diminish in any manner the District's independent authority to implement and enforce its regulations, either alone or jointly with the ARB.

## 4.2 Standards of Performance

- 4.2.1 When implementing and enforcing the ARB Landfill Regulation, the



following standards of performance shall apply:

- 4.2.1.1 The District shall carry out implementation and enforcement activities pursuant to this MOU in accordance with ARB regulations, rules, policy, guidance, and training.
- 4.2.1.2 The District's implementation and enforcement activities pursuant to this MOU shall be carried out by qualified inspectors or trained enforcement staff.
- 4.2.1.3 ARB shall provide the District with periodic training as needed.
- 4.2.1.4 In the event of a disagreement between the District and a third party regarding the interpretation of an ARB regulation, ARB must be notified by the District in a timely manner and ARB will provide input and assistance in resolving the dispute.

#### 4.3 ARB Oversight

- 4.3.1 With advance notice to the District, ARB personnel may accompany District personnel on inspections and other enforcement activities and may review any District records related to enforcement of the ARB Landfill Regulation. District personnel may accompany ARB personnel on inspections for purposes of training, ensuring consistency, and joint enforcement.
- 4.3.2 ARB may periodically evaluate the performance of the District in implementing and enforcing the ARB Landfill Regulation and shall review and discuss any evaluations with the District with a primary aim of ensuring consistency between ARB and District enforcement activities.
- 4.3.3 For all ARB Landfill Regulation implementation and enforcement activities conducted pursuant to this MOU, the District shall submit an annual report to ARB including all of the following (annual reports submitted by landfill owners/operators in compliance with the regulation can be forwarded to ARB by the District and any data from previous annual reports do not need to be included):
  - 4.3.3.1 A summary of NOV's or other citations issued by the District specifying the issue date, landfill name, and, section of the ARB Landfill Regulation or equivalent District rule cited for each NOV or other citation.
  - 4.3.3.2 The total number of instantaneous surface methane readings of 200 ppmv or greater pursuant to sections 95470(a)(1)(D) and 95471(c)(2)(A) of the ARB Landfill Regulation.

4.3.3.3 A summary of alternative compliance options approved by the District pursuant to section 95468 for sections 95464, 95469, and 95471 of the ARB Landfill Regulation. The District shall provide the landfill name, address, nature of request, approval date, and section of the ARB Landfill Regulation or cited for each alternative compliance option approved by the District.

4.3.3.4 The emission data required in section 95470(b)(3)(A) through 95470(b)(3)(I) of the ARB Landfill Regulation for each landfill since the previous annual report, except a topographic map of the landfill need only be submitted on a one-time only basis.

4.3.4 Districts that have not adopted a separate District landfill rule that is as or more stringent than the ARB Landfill Regulation shall also submit the information required in Section 4.3.3.1. in a semiannual report to ARB.

#### 4.4 Implementation and Enforcement Coordination

4.4.1 ARB will conduct joint inspections and investigations as requested by the District.

4.4.2 ARB may pursue litigation or settlement using the authority, mechanisms, and remedies available to it under California law.

4.5 Civil Penalties. When the District issues a NOV/citation for violation of the ARB Landfill Regulation and refers the violation to ARB for litigation or settlement, any civil penalties for the violation, or payments made in settlement as civil penalties or in lieu thereof obtained by ARB shall be shared equally between the Parties. When the District litigates or settles any violation, in addition to District costs, the District will seek reasonable costs ARB incurs pursuant to section 4.4.1, to the extent requested by ARB, as part of the District's penalty award or assessment. The District is not required to reimburse ARB for any costs incurred by ARB that cannot be collected as part of the District's penalty award or assessment.

4.6 Term. This MOU shall be effective upon full execution by both Parties and shall continue in full force and effect unless terminated by either Party pursuant to the terms of the MOU.

4.7 Termination. Either Party may terminate this MOU for any reason by providing a written notice of termination no later than 60 days before the date of termination.

4.8 Indemnification. Each Party agrees to indemnify, defend and hold harmless the other party, and the officers, employees, agents and contractors of the other, from and against any claims, liabilities, costs or losses of any kind that arise from, or are alleged to arise from the Party's actions under or the performance of

this MOU, except for any such loss, damage, injury or death to the extent caused by the active negligence or other wrongful conduct of the other Party.

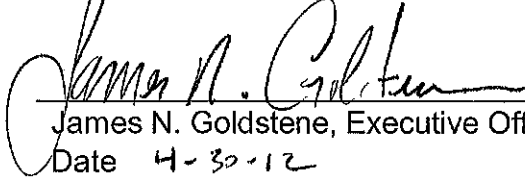
- 4.9 Entire Agreement. This MOU represents the entire agreement of the Parties, and merges and supersedes any prior written or oral representations, discussions, understandings or agreements by or between the Parties relating to the subject matter of this MOU.
- 4.10 Modification. No addition to or modification of any term or provision of this MOU will be effective unless set forth in writing and signed by an authorized representative of each of the Parties.
- 4.11 Authority. Each Party represents and warrants that it has the right, power, and authority to execute this MOU. Each Party represents and warrants that it has given any and all notices, and obtained any and all consents, powers and authorities, necessary to permit it, and the persons executing this MOU for it, to enter into this MOU.
- 4.12 Limitations. Except as provided in this MOU, this MOU does not create and shall not be construed to create any right, permission, or requirement for the District to implement or enforce any authority of ARB regarding regulations adopted by ARB pursuant to AB 32.
- 4.13 Third Parties. This MOU shall not be construed to bind any Party in any manner with respect to any person or entity that is not a Party to this MOU, or a successor or assign of a Party.
- 4.14 Notices. Any notice or report required or permitted to be given under this MOU shall be in writing and shall be deemed to be given when served personally, or on the third day after mailing if mailed in the United States mail, postage prepaid, addressed to the address for each Party set forth below:

To ARB:                      Attention: James Ryden  
   Chief of the Enforcement Division  
   California Air Resources Board  
   1001 "I" Street  
   P.O. Box 2815  
   Sacramento, CA 95812

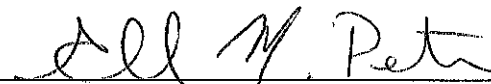
To District:                      Attention: Brad Poiriez  
   Air Pollution Control Officer  
   Imperial County Air Pollution Control District  
   150 S. 9<sup>th</sup> Street  
   El Centro, CA 92243

IN WITNESS WHEREOF, this MOU has been executed by the parties hereto.

CALIFORNIA AIR RESOURCES  
BOARD

  
James N. Goldstene, Executive Officer  
Date 4-30-12

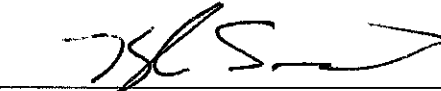
Approved as to form

  
Ellen M. Peter, Chief Counsel  
Date 4/27/2012

IMPERIAL COUNTY AIR POLLUTION  
CONTROL DISTRICT

  
Brad Poiriez, Air Pollution Control Officer  
Date

Approved as to form

  
Kyle Sand, County Counsel  
Date 2-28-12

## FINAL REGULATION ORDER

### Methane Emissions from Municipal Solid Waste Landfills

#### Subchapter 10. Climate Change

#### Article 4. Regulations to Achieve Greenhouse Gas Emission Reductions

#### Subarticle 6. Methane Emissions from Municipal Solid Waste Landfills

*Adopt new Article 4, Subarticle 6, sections 95460 to 95476, title 17, California Code of Regulations, to read as follows: (Note that the entire text of sections 95460 to 95476 set forth below is new language to be added to the California Code of Regulations.)*

#### **§ 95460. Purpose**

The purpose of this subarticle is to reduce methane emissions from municipal solid waste (MSW) landfills pursuant to the California Global Warming Solutions Act of 2006 (Health & Safety Code, Sections 38500 et. seq.).

Note: Authority cited: Sections 38501, 38510, 38560, 38560.5, 38580, 39600, and 39601, Health and Safety Code. Reference: Sections 38501, 38505, 38510, 38550, 38551, 38560, 38560.5, 39003, 39500, 39600, and 39601, Health and Safety Code.

#### **§ 95461. Applicability**

This subarticle applies to all MSW landfills that received solid waste after January 1, 1977.

Note: Authority cited: Sections 38501, 38510, 38560, 38560.5, 38580, 39600, and 39601, Health and Safety Code. Reference: Sections 38501, 38505, 38510, 38550, 38551, 38560, 38560.5, 39003, 39500, 39600, and 39601, Health and Safety Code.

#### **§ 95462. Exemptions**

- (a) This subarticle does not apply to landfills that receive only hazardous waste, or are currently regulated under the Comprehensive Environmental Response, Compensation and Liability Act 42 U.S.C, Chapter 103 (*Promulgated 12/11/80; Amended 10/17/86*).
- (b) This subarticle does not apply to landfills that receive only construction and demolition wastes, inert waste, or non-decomposable wastes.
- (c) This subarticle does not apply to closed or inactive MSW landfills with less than 450,000 tons of waste-in-place.

Note: Authority cited: Sections 38501, 38510, 38560, 38560.5, 38580, 39600, and 39601, Health and Safety Code. Reference: Sections 38501, 38505, 38510, 38550, 38551, 38560, 38560.5, 39003, 39500, 39600, and 39601, Health and Safety Code.

**§ 95463. Determination for Installing a Gas Collection and Control System**

- (a) *Active MSW Landfills Less Than 450,000 Tons of Waste-in-Place:* Each owner or operator of an active MSW landfill having less than 450,000 tons of waste-in-place must submit a Waste-in-Place Report to the Executive Officer pursuant to section 95470(b)(4), within 90 days of the effective date of this subarticle.
- (1) The Waste-in-Place report must be prepared for the period of January 1 through December 31 of each year. The report must be submitted to the Executive Officer by March 15 of the following year.
  - (2) The Waste-in-Place report must be submitted annually until either:
    - (A) ~~The MSW landfill reaches a size greater than or equal to 450,000 tons of waste-in-place; or~~
    - (B) The owner or operator submits a Closure Notification pursuant to section 95470(b)(1).
- (b) *MSW Landfills Greater Than or Equal to 450,000 Tons of Waste-in-Place:* Within 90 days of the effective date of this subarticle or upon reaching 450,000 tons of waste-in-place, each owner or operator of an MSW landfill having greater than or equal to 450,000 tons of waste-in-place must calculate the landfill gas heat input capacity pursuant to section 95471(b) and must submit a Landfill Gas Heat Input Capacity Report to the Executive Officer.
- (1) If the calculated landfill gas heat input capacity is less than 3.0 million British thermal units per hour (MMBtu/hr) recovered, the owner or operator must:
    - (A) Recalculate the landfill gas heat input capacity annually using the procedures specified in section 95471(b).
    - (B) Submit an annual Landfill Gas Heat Input Capacity Report to the Executive Officer until either of the following conditions is met:
      1. The calculated landfill gas heat input capacity is greater than or equal to 3.0 MMBtu/hr recovered, or
      2. If the MSW landfill is active, the owner or operator submits a Closure Notification pursuant to section 95470(b)(1).

Submitting the Closure Notification fulfills the requirements of this subarticle. If the MSW landfill is closed or inactive, submittal of the Closure Notification is not required to fulfill the requirements of the subarticle.

- (2) If the landfill gas heat input capacity is greater than or equal to 3.0 MMBtu/hr recovered the owner or operator must either:
  - (A) Comply with the requirements of sections 95464 through 95476, or
  - (B) Demonstrate to the satisfaction of the Executive Officer that after four consecutive quarterly monitoring periods there is no measured concentration of methane of 200 parts per million by volume (ppmv) or greater using the instantaneous surface monitoring procedures specified in sections 95471(c)(1) and 95471(c)(2). Based on the monitoring results, the owner or operator must do one of the following:
    1. If there is any measured concentration of methane of 200 ppmv or greater from the surface of an active, inactive, or closed MSW landfill, comply with sections 95464 through 95476;
    2. If there is no measured concentration of methane of 200 ppmv or greater from the surface of an active MSW landfill, comply with section 95463(b) and recalculate the landfill gas heat input capacity annually as required in section 95463(b) until such time the owner or operator submits a Closure Notification pursuant to section 95470(b)(1); or
    3. If there is no measured concentration of methane of 200 ppmv or greater from the surface of a closed or inactive MSW landfill, the requirements of sections 95464 through 95470 no longer apply provided that the following information is submitted to and approved by the Executive Officer within 90 days:
      - a. A Waste-in-Place Report pursuant to section 95470(b)(4); and
      - b. All instantaneous surface monitoring records.

Note: Authority cited: Sections 38501, 38510, 38560, 38560.5, 38580, 39600, and 39601, Health and Safety Code. Reference: Sections 38501, 38505, 38510, 38550, 38551, 38560, 38560.5, 39003, 39500, 39600, and 39601, Health and Safety Code.

**§ 95464. Gas Collection and Control System Requirements**

(a) *Design Plan and Installation.*

(1) *Design Plan:* If a gas collection and control system which meets the requirements of either sections 95464(b)(1), 95464(b)(2) or 95464(b)(3) has not been installed, the owner or operator of a MSW landfill must submit a Design Plan to the Executive Officer within one year after the effective date of this subarticle, or within one year of detecting any leak on the landfill surface exceeding a methane concentration of 200 ppmv pursuant to section 95463(b)(2)(B). The Executive Officer must review and either approve or disapprove the Design Plan within 120 days. The Executive Officer may request that additional information be submitted as part of the review of the Design Plan. At a minimum, the Design Plan must meet the following requirements:

- (A) The Design Plan must be prepared and certified by a professional engineer.
- (B) The Design Plan must provide for the control of the collected gas through the use of a gas collection and control system meeting the requirements of either sections 95464(b)(1), 95464(b)(2) or 95464(b)(3).
- (C) The Design Plan must include any proposed alternatives to the requirements, test methods, procedures, compliance measures, monitoring, and recordkeeping or reporting requirements pursuant to section 95468.
- (D) A description of potential mitigation measures to be used to prevent the release of methane or other pollutants into the atmosphere during the installation or preparation of wells, piping, or other equipment; during repairs or the temporary shutdown of gas collection system components; or, when solid waste is to be excavated and moved.
- (E) For active MSW landfills, the design plan must identify areas of the landfill that are closed or inactive.
- (F) Design the gas collection and control system to handle the expected gas generation flow rate from the entire area of the MSW landfill and to collect gas at an extraction rate to comply with the surface methane emission limits in section 95465 and component leak standard in section 95464(b)(1)(B). The expected gas generation flow rate from the MSW landfill must be calculated pursuant to section 95471(e).



1. Any areas of the landfill that contain only asbestos-containing waste, inert waste, or non-decomposable solid waste may be excluded from collection provided that the owner or operator submits documentation to the Executive Officer containing the nature, date of deposition, location and amount of asbestos or non-decomposable solid waste deposited in the area. This documentation may be included as part of the Design Plan.
  - (2) Any owner or operator of an active MSW landfill must install and operate a gas collection and control system within 18 months after approval of the Design Plan.
  - (3) Any owner or operator of a closed or inactive MSW landfill must install and operate a gas collection and control system within 30 months after approval of the Design Plan.
  - (4) If an owner or operator is modifying an existing gas collection and control system to meet the requirements of this subarticle, the existing Design Plan must be amended to include any necessary updates or addenda, and must be certified by a professional engineer.
  - (5) An amended Design Plan must be submitted to the Executive Officer within 90 days of any event that requires a change to the Design Plan.
  - (6) The gas collection system must be operated, maintained, and expanded in accordance with the procedures and schedules in the approved Design Plan.
- (b) *Gas Collection and Control System Requirements.*
- (1) *General Requirements.* The owner or operator must satisfy the following requirements when operating a gas collection and control system:
    - (A) Route the collected gas to a gas control device or devices, and operate the gas collection and control system continuously except as provided in sections 95464(d) and 95464(e).
    - (B) Operate the gas collection and control system so that there is no landfill gas leak that exceeds 500 ppmv, measured as methane, at any component under positive pressure.
    - (C) The gas collection system must be designed and operated to draw all the gas toward the gas control device or devices.

- (2) *Requirements for Flares.* An MSW landfill owner or operator who operates a flare must satisfy the following requirements:
- (A) Route the collected gas to an enclosed flare that meets the following requirements:
1. Achieves a methane destruction efficiency of at least 99 percent by weight.
  2. Is equipped with automatic dampers, an automatic shutdown device, a flame arrester, and continuous recording temperature sensors.
  3. During restart or startup there must be a sufficient flow of propane or commercial natural gas to the burners to prevent unburned collected methane from being emitted to the atmosphere.
  4. The gas control device must be operated within the parameter ranges established during the initial or most recent source test.
- (B) Route the collected gas to an open flare that meets the requirements of 40 CFR § 60.18 (as last amended 73 Fed.Reg. 78209 (December 22, 2008), which is incorporated by reference herein. The operation of an open flare is not allowed except under the following conditions:
1. An open flare installed and operating prior to August 1, 2008, may operate until January 1, 2018.
  2. Operation of an open flare on or after January 1, 2018, may be allowed if the owner or operator can demonstrate to the satisfaction of the Executive Officer that the landfill gas heat input capacity is less than 3.0 MMBtu/hr pursuant to section 95471(b) and is insufficient to support the continuous operation of an enclosed flare or other gas control device.
  3. The owner or operator is seeking to temporarily operate an open flare during the repair or maintenance of the gas control system, or while awaiting the installation of an enclosed flare, or to address offsite gas migration issues.
    - a. Any owner seeking to temporarily operate an open flare must submit a written request to the Executive Officer pursuant to section 95468.

- (3) *Requirements for Gas Control Devices other than Flares.* An MSW landfill owner or operator who operates a gas control device other than a flare must satisfy one of the following requirements:
- (A) Route the collected gas to an energy recovery device, or series of devices that meets the following requirements:
    1. Achieves a methane destruction efficiency of at least 99 percent by weight. Lean burn internal combustion engines must reduce the outlet methane concentration to less than 3,000 ppmv, dry basis, corrected to 15 percent oxygen.
    2. If a boiler or a process heater is used as the gas control device, the landfill gas stream must be introduced into the flame zone. Where the landfill gas is not the primary fuel for the boiler or process heater, introduction of the landfill gas stream into the flame zone is not required.
    3. The gas control device must be operated within the parameter ranges established during the initial or most recent source test.
  - (B) Route the collected gas to a treatment system that processes the collected gas for subsequent sale or use. All emissions vented to the atmosphere from the gas treatment system are subject to the requirements of sections 95464(b)(2).
- (4) *Source Test Requirements:* The owner or operator must conduct an annual source test for any gas control device(s) subject to the requirements of sections 95464(b)(2)(A) or 95464(b)(3)(A) using the test methods identified in 95471(f). An initial source test must be conducted within 180 days of initial start up of the gas collection and control system. Each succeeding complete annual source test must be conducted no later than 45 days after the anniversary date of the initial source test.
- (A) If a gas control device remains in compliance after three consecutive source tests the owner or operator may conduct the source test every three years. If a subsequent source test shows the gas collection and control system is out of compliance the source testing frequency will return to annual.
- (c) *Wellhead Gauge Pressure Requirement:* Each wellhead must be operated under a vacuum (negative pressure), except as provided in sections 95464(d) and 95464(e), or under any of the following conditions:

- (1) Use of a geomembrane or synthetic cover. The owner or operator must develop acceptable pressure limits for the wellheads and include them in the Design Plan; or
  - (2) A decommissioned well.
- (d) *Well Raising:* The requirements of sections 95464(b)(1)(A), 95464(b)(1)(B), and 95464(c), do not apply to individual wells involved in well raising provided the following conditions are met:
- (1) New fill is being added or compacted in the immediate vicinity around the well.
  - (2) Once installed, a gas collection well extension is sealed or capped until the raised well is reconnected to a vacuum source.
- (e) *Repairs and Temporary Shutdown of Gas Collection System Components:* The requirements of sections 95464(b)(1)(A), 95464(b)(1)(B), and 95464(c), do not apply to individual landfill gas collection system components that must be temporarily shut down in order to repair the components, due to catastrophic events such as earthquakes, to connect new landfill gas collection system components to the existing system, to extinguish landfill fires, or to perform construction activities pursuant to section 95466, provided the following requirements are met:
- (1) Any new gas collection system components required to maintain compliance with this subarticle must be included in the most recent Design Plan pursuant to section 95464(a)(4).
  - (2) Methane emissions are minimized during shutdown pursuant to section 95464(a)(1)(D).

Note: Authority cited: Sections 38501, 38510, 38560, 38560.5, 38580, 39600, and 39601, Health and Safety Code. Reference: Sections 38501, 38505, 38510, 38550, 38551, 38560, 38560.5, 39003, 39500, 39600, and 39601, Health and Safety Code.

#### **§ 95465. Surface Methane Emission Standards**

- (a) Except as provided in sections 95464(d), 95464(e), and 95466, beginning January 1, 2011, or upon commencing operation of a newly installed gas collection and control system or modification of an existing gas collection and control system pursuant to 95464(a)(1), whichever is later, no location on the MSW landfill surface may exceed either of the following methane concentration limits:

- (1) 500 ppmv, other than non-repeatable, momentary readings, as determined by instantaneous surface emissions monitoring.
- (2) An average methane concentration limit of 25 ppmv as determined by integrated surface emissions monitoring.

Note: Authority cited: Sections 38501, 38510, 38560, 38560.5, 38580, 39600, and 39601, Health and Safety Code. Reference: Sections 38501, 38505, 38510, 38550, 38551, 38560, 38560.5, 39003, 39500, 39600, and 39601, Health and Safety Code.

#### **§ 95466. Construction Activities**

- (a) The requirements of section 95465 do not apply to the working face of the landfill or to areas of the landfill surface where the landfill cover material has been removed and refuse has been exposed for the purpose of installing, expanding, replacing, or repairing components of the landfill gas, leachate, or gas condensate collection and removal system, or for law enforcement activities requiring excavation.

Note: Authority cited: Sections 38501, 38510, 38560, 38560.5, 38580, 39600, and 39601, Health and Safety Code. Reference: Sections 38501, 38505, 38510, 38550, 38551, 38560, 38560.5, 39003, 39500, 39600, and 39601, Health and Safety Code.

#### **§ 95467. Permanent Shutdown and Removal of the Gas Collection and Control System**

- (a) The gas collection and control system at a closed MSW landfill can be capped or removed provided the following requirements are met:
  - (1) The gas collection and control system was in operation for at least 15 years, unless the owner or operator can demonstrate to the satisfaction of the Executive Officer that due to declining methane rates the MSW landfill will be unable to operate the gas collection and control system for a 15-year period.
  - (2) Surface methane concentration measurements do not exceed the limits specified in section 95465.
  - (3) The owner or operator submits an Equipment Removal Report to the Executive Officer pursuant to section 95470(b)(2).

Note: Authority cited: Sections 38501, 38510, 38560, 38560.5, 38580, 39600, and 39601, Health and Safety Code. Reference: Sections 38501, 38505, 38510, 38550, 38551, 38560, 38560.5, 39003, 39500, 39600, and 39601, Health and Safety Code.

**§ 95468. Alternative Compliance Options**

- (a) The owner or operator may request alternatives to the compliance measures, monitoring requirements, test methods and procedures of sections 95464, 95469, and 95471. Any alternatives requested by the owner or operator must be submitted in writing to the Executive Officer. Alternative compliance option requests may include, but are not limited to, the following:
- (1) Semi-continuous operation of the gas collection and control system due to insufficient landfill gas flow rates.
  - (2) Additional time allowance for leak repairs for landfills having consistent issues related to the procurement and delivery of necessary parts to complete the repair, or adverse weather conditions that impede repair work.
  - (3) Alternative wind speed requirements for landfills consistently having winds in excess of the limits specified in this subarticle.
  - (4) Alternative walking patterns to address potential safety and other issues, such as: steep or slippery slopes, monitoring instrument obstructions, and physical obstructions.
  - (5) Exclusion of construction areas and other dangerous areas from landfill surface inspection.
  - (6) Exclusion of paved roads that do not have any cracks, pot holes, or other penetrations from landfill surface inspection.
- (b) Criteria that the Executive Officer may use to evaluate alternative compliance option requests include, but are not limited to: compliance history; documentation containing the landfill gas flow rate and measured methane concentrations for individual gas collection wells or components; permits; component testing and surface monitoring results; gas collection and control system operation, maintenance, and inspection records; and historical meteorological data.
- (c) The Executive Officer will review the requested alternatives and either approve or disapprove the alternatives within 120 days. The Executive Officer may request that additional information be submitted as part of the review of the requested alternatives.
- (1) If a request for an alternative compliance option is denied, the Executive Officer will provide written reasons for the denial.

- (2) The Executive Officer must deny the approval of any alternatives not providing equivalent levels of enforceability or methane emission control.

Note: Authority cited: Sections 38501, 38510, 38560, 38560.5, 38580, 39600, and 39601, Health and Safety Code. Reference: Sections 38501, 38505, 38510, 38550, 38551, 38560, 38560.5, 39003, 39500, 39600, and 39601, Health and Safety Code.

## § 95469. Monitoring Requirements

- (a) *Surface Emissions Monitoring Requirements:* Any owner or operator of a MSW landfill with a gas collection and control system must conduct instantaneous and integrated surface monitoring of the landfill surface quarterly using the procedures specified in section 95471(c).
- (1) *Instantaneous Surface Monitoring:* Any reading exceeding the limit specified in section 95465(a)(1) must be recorded as an exceedance and the following actions must be taken:
- (A) The owner or operator must record the date, location, and value of each exceedance, along with re-test dates and results. The location of each exceedance must be clearly marked and identified on a topographic map of the MSW landfill, drawn to scale with the location of both the grids and the gas collection system clearly identified.
- (B) Corrective action must be taken by the owner or operator such as, but not limited to, cover maintenance or repair, or well vacuum adjustments and the location must be remonitored within ten calendar days of a measured exceedance.
1. If the re-monitoring of the location shows a second exceedance, additional corrective action must be taken and the location must be re-monitored again no later than 10 calendar days after the second exceedance.
  2. If the re-monitoring shows a third exceedance, the owner or operator must install a new or replacement well as determined to achieve compliance no later than 120 calendar days after detecting the third exceedance, or it is a violation of this subarticle.
- (C) Any closed or inactive MSW landfill, or any closed or inactive areas on an active MSW landfill that has no monitored exceedances of the limit specified in section 95465(a)(1) after four consecutive quarterly monitoring periods may monitor annually. Any exceedances of the limit specified in section 95465(a)(1) detected

during the annual monitoring that can not be remediated within 10 calendar days will result in a return to quarterly monitoring of the landfill.

- (D) Any exceedances of the limit specified in section 95465(a)(1) detected during any compliance inspections will result in a return to quarterly monitoring of the landfill.
- (2) *Integrated Surface Monitoring:* Any reading exceeding the limit specified in section 95465(a)(2) must be recorded as an exceedance and the following actions must be taken:
- (A) The owner or operator must record the average surface concentration measured as methane for each grid along with re-test dates and results. The location of the grids and the gas collection system must be clearly marked and identified on a topographic map of the MSW landfill drawn to scale.
  - (B) Within 10 calendar days of a measured exceedance, corrective action must be taken by the owner or operator such as, but not limited to, cover maintenance or repair, or well vacuum adjustments and the grid must be re-monitored.
    - 1. If the re-monitoring of the grid shows a second exceedance, additional corrective action must be taken and the location must be re-monitored again no later than 10 calendar days after the second exceedance.
    - 2. If the re-monitoring in section 95469(a)(2)(B)1. shows a third exceedance, the owner or operator must install a new or replacement well as determined to achieve compliance no later than 120 calendar days after detecting the third exceedance, or it is a violation of this subarticle.
  - (C) Any closed or inactive MSW landfill, or any closed or inactive areas on an active MSW landfill that has no monitored exceedances of the limit specified in section 95465(a)(2) after 4 consecutive quarterly monitoring periods may monitor annually. Any exceedances of the limits specified in section 95465(a)(2) detected during the annual monitoring that can not be remediated within 10 calendar days will result in a return to quarterly monitoring of the landfill.
  - (D) Any exceedances of the limits specified in section 95465(a)(2) detected during any compliance inspections will result in a return to quarterly monitoring of the landfill.



- (3) An owner or operator of a closed or inactive MSW landfill, or any closed or inactive areas on an active MSW landfill that can demonstrate that in the three years before the effective date of this subarticle that there were no measured exceedances of the limits specified in section 95465 by annual or quarterly monitoring may monitor annually. Any exceedances of the limits specified in section 95465 detected during the annual monitoring that can not be remediated within 10 calendar days will result in a return to quarterly monitoring of the landfill.
- (b) *Gas Control System Equipment Monitoring:* The owner or operator must monitor the gas control system using the following procedures:
- (1) For enclosed flares the following equipment must be installed, calibrated, maintained, and operated according to the manufacturer's specifications:
    - (A) A temperature monitoring device equipped with a continuous recorder which has an accuracy of plus or minus ( $\pm$ ) 1 percent of the temperature being measured expressed in degrees Celsius or Fahrenheit.
    - (B) At least one gas flow rate measuring device which must record the flow to the control device(s) at least every 15 minutes.
  - (2) For a gas control device other than an enclosed flare, demonstrate compliance by providing information describing the operation of the gas control device, the operating parameters that would indicate proper performance, and appropriate monitoring procedures. Alternatives to this section must be submitted as specified in section 95468. The Executive Officer may specify additional monitoring procedures.
  - (3) Components containing landfill gas and under positive pressure must be monitored quarterly for leaks. Any component leak must be tagged and repaired within 10 calendar days, or it is a violation of this subarticle.
    - (A) Component leak testing at MSW landfills having landfill gas-to-energy facilities may be conducted prior to scheduled maintenance or planned outage periods.
- (c) *Wellhead Monitoring:* The owner or operator must monitor each individual wellhead monthly to determine the gauge pressure. If there is any positive pressure reading other than as provided in sections 95464(d) and 95464(e), the owner or operator must take the following actions:
- (1) Initiate corrective action within five calendar days of the positive pressure measurement.

- (2) If the problem cannot be corrected within 15 days of the date the positive pressure was first measured, the owner or operator must initiate further action, including, but not limited to, any necessary expansion of the gas collection system, to mitigate any positive pressure readings.
- (3) Corrective actions, including any expansion of the gas collection and control system, must be completed and any new wells must be operating within 120 days of the date the positive pressure was first measured, or it is a violation of this subarticle.

Note: Authority cited: Sections 38501, 38510, 38560, 38560.5, 38580, 39600, and 39601, Health and Safety Code. Reference: Sections 38501, 38505, 38510, 38550, 38551, 38560, 38560.5, 39003, 39500, 39600, and 39601, Health and Safety Code.

### **§ 95470. Recordkeeping and Reporting Requirements.**

#### **(a) Recordkeeping Requirements.**

- (1) An owner or operator must maintain the following records, whether in paper, electronic, or other format, for at least five years:
  - (A) All gas collection system downtime exceeding five calendar days, including individual well shutdown and disconnection times, and the reason for the downtime.
  - (B) All gas control system downtime in excess of one hour, the reason for the downtime, and the length of time the gas control system was shutdown.
  - (C) Expected gas generation flow rate calculated pursuant to section 95471(e).
  - (D) Records of all instantaneous surface readings of 200 ppmv or greater; all exceedances of the limits in sections 95464(b)(1)(B) or 95465, including the location of the leak (or affected grid), leak concentration in ppmv, date and time of measurement, the action taken to repair the leak, date of repair, any required re-monitoring and the re-monitored concentration in ppmv, and wind speed during surface sampling; and the installation date and location of each well installed as part of a gas collection system expansion.
  - (E) Records of any positive wellhead gauge pressure measurements, the date of the measurements, the well identification number, and the corrective action taken.

- (F) Annual solid waste acceptance rate and the current amount of waste-in-place.
- (G) Records of the nature, location, amount, and date of deposition of non-degradable waste for any landfill areas excluded from the collection system.
- (H) Results of any source tests conducted pursuant to section 95464(b)(4).
- (I) Records describing the mitigation measures taken to prevent the release of methane or other emissions into the atmosphere:
  - 1. When solid waste was brought to the surface during the installation or preparation of wells, piping, or other equipment;
  - 2. During repairs or the temporary shutdown of gas collection system components; or,
  - 3. When solid waste was excavated and moved.
- (J) Records of any construction activities pursuant to section 95466. The records must contain the following information:
  - 1. A description of the actions being taken, the areas of the MSW landfill that will be affected by these actions, the reason the actions are required, and any landfill gas collection system components that will be affected by these actions.
  - 2. Construction start and finish dates, projected equipment installation dates, and projected shut down times for individual gas collection system components.
  - 3. A description of the mitigation measures taken to minimize methane emissions and other potential air quality impacts.
- (K) Records of the equipment operating parameters specified to be monitored under sections 95469(b)(1) and 95469(b)(2) as well as records for periods of operation during which the parameter boundaries established during the most recent source test are exceeded. The records must include the following information:
  - 1. For enclosed flares, all 3-hour periods of operation during which the average temperature difference was more than

28 degrees Celsius (or 50 degrees Fahrenheit) below the average combustion temperature during the most recent source test at which compliance with sections 95464(b)(2) and 95464(b)(3)(A) was determined.

2. For boilers or process heaters, whenever there is a change in the location at which the vent stream is introduced into the flame zone pursuant to section 95464(b)(3)(A)2.
  3. For any owner or operator who uses a boiler or process heater with a design heat input capacity of 44 megawatts (150 MMBtu/hr) or greater to comply with section 95464(b)(3), all periods of operation of the boiler or process heater (e.g., steam use, fuel use, or monitoring data collected pursuant to other federal, State, local, or tribal regulatory requirements).
- (2) The owner or operator must maintain the following records, whether in paper, electronic, or other format, for the life of each gas control device, as measured during the initial source test or compliance determination:
- (A) The control device vendor specifications.
  - (B) The expected gas generation flow rate as calculated pursuant to section 95471(e).
  - (C) The percent reduction of methane achieved by the control device determined pursuant to section 95471(f).
  - (D) For a boiler or process heater, the description of the location at which the collected gas vent stream is introduced into the boiler or process heater over the same time period of the performance test.
  - (E) For an open flare: the flare type (i.e., steam-assisted, air-assisted, or non-assisted); all visible emission readings, heat content determination, flow rate or bypass flow rate measurements, and exit velocity determinations made during the performance test as specified in 40 CFR § 60.18 (as last amended 73 Fed.Reg. 78209 (December 22, 2008), which is incorporated by reference herein; and records of the flare pilot flame or flare flame monitoring and records of all periods of operations during which the pilot flame or the flare flame is absent.
- (3) *Record Storage:* The owner or operator must maintain copies of the records and reports required by this subarticle and provide them to the

Executive Officer within five business days upon request. Records and reports must be kept at a location within the State of California.

(b) *Reporting Requirements.*

- (1) *Closure Notification:* Any owner or operator of a MSW landfill which has ceased accepting waste must submit a Closure Notification to the Executive Officer within 30 days of waste acceptance cessation.
  - (A) The Closure Notification must include the last day solid waste was accepted, the anticipated closure date of the MSW landfill, and the estimated-waste-in-place.
  - (B) The Executive Officer may request additional information as necessary to verify that permanent closure has taken place in accordance with the requirements of any applicable federal, State, local, or tribal statutes, regulations, and ordinances in effect at the time of closure.
- (2) *Equipment Removal Report:* A gas collection and control system Equipment Removal Report must be submitted to the Executive Officer 30 days prior to well capping, removal or cessation of operation of the gas collection, treatment, or control system equipment. The report must contain all of the following information:
  - (A) A copy of the Closure Notification submitted pursuant to section 95470(b)(1).
  - (B) A copy of the initial source test report or other documentation demonstrating that the gas collection and control system has been installed and operated for a minimum of 15 years, unless the owner or operator can demonstrate to the satisfaction of the Executive Officer that due to declining methane rates the landfill is unable to operate the gas collection and control system for a 15-year period.
  - (C) Surface emissions monitoring results needed to verify that landfill surface methane concentration measurements do not exceed the limits specified in section 95465.
- (3) *Annual Report:* Any owner or operator subject to the requirements of this subarticle, except section 95463, must prepare an annual report for the period of January 1 through December 31 of each year. Each annual report must be submitted to the Executive Officer by March 15 of the following year. The annual report must contain the following information:

- (A) MSW landfill name, owner and operator, address, and solid waste information system (SWIS) identification number.
  - (B) Total volume of landfill gas collected (reported in standard cubic feet).
  - (C) Average composition of the landfill gas collected over the reporting period (reported in percent methane and percent carbon dioxide by volume).
  - (D) Gas control device type, year of installation, rating, fuel type, and total amount of landfill gas combusted in each control device.
  - (E) The date that the gas collection and control system was installed and in full operation.
  - (F) The percent methane destruction efficiency of each gas control device(s).
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- (G) Type and amount of supplemental fuels burned with the landfill gas in each device.
  - (H) Total volume of landfill gas shipped off-site, the composition of the landfill gas collected (reported in percent methane and percent carbon dioxide by volume), and the recipient of the gas.
  - (I) Most recent topographic map of the site showing the areas with final cover and a geomembrane and the areas with final cover without a geomembrane with corresponding percentages over the landfill surface.
  - (J) The information required by sections 95470(a)(1)(A), 95470(a)(1)(B), 95470(a)(1)(C), 95470(a)(1)(D), 95470(a)(1)(E), and 95470(a)(1)(F), 95470(a)(1)(H), and 95470(a)(1)(K).
- (4) *Waste-in-Place Report*: Any owner or operator subject to the requirements of sections 95463(a), or 95643(b)(2)(B)3. must report the following information to the Executive Officer:
- (A) MSW landfill name, owner and operator, address, and solid waste information system (SWIS) identification number.
  - (B) The landfill's status (active, closed, or inactive) and the estimated waste-in-place, in tons.

- (C) Most recent topographic map of the site showing the areas with final cover and a geomembrane and the areas with final cover without a geomembrane with corresponding percentages over the landfill surface.
- (5) *Landfill Gas Heat Input Capacity Report:* Any owner or operator subject to the requirements of section 95463(b) must calculate the landfill gas heat input capacity using the calculation procedures specified in section 95471(b) and report the results to the Executive Officer within 90 days of the effective date of this subarticle or upon reaching 450,000 tons of waste-in-place. The calculation, along with relevant parameters, must be provided as part of the report.
- (6) Any report, or information submitted pursuant to this subarticle must contain certification by a responsible official of truth, accuracy, and completeness. This certification, and any other certification required under this subarticle, must state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

Note: Authority cited: Sections 38501, 38510, 38560, 38560.5, 38580, 39600, and 39601, Health and Safety Code. Reference: Sections 38501, 38505, 38510, 38550, 38551, 38560, 38560.5, 39003, 39500, 39600, and 39601, Health and Safety Code.

#### **§ 95471. Test Methods and Procedures**

- (a) *Hydrocarbon Detector Specifications:* Any instrument used for the measurement of methane must be a gas detector or other equivalent instrument approved by the Executive Officer that meets the calibration, specifications, and performance criteria of EPA Reference Method 21, Determination of Volatile Organic Compound Leaks, 40 CFR Part 60, Appendix A (as last amended 65 Fed.Reg. 61744 (October 17, 2000)), which is incorporated by reference herein, except for the following:
  - (1) "Methane" replaces all references to volatile organic compounds (VOC).
  - (2) The calibration gas shall be methane.
- (b) *Determination of Landfill Gas Heat Input Capacity:* The landfill gas heat input capacity must be determined pursuant to sections 95471(b)(1), 95471(b)(2), or 95471(b)(3), as applicable:
  - (1) *MSW Landfills without Carbon Adsorption or Passive Venting Systems:* The heat input capacity must be calculated using the procedure as specified in Appendix I. The Executive Officer may request additional

information as may be necessary to verify the heat input capacity from the MSW landfill. Site-specific data may be substituted when available.

- (2) *MSW Landfills with Carbon Adsorption Systems:* The landfill gas heat capacity must be determined by measuring the actual total landfill gas flow rate, in standard cubic feet per minute (scfm), using a flow meter or other flow measuring device such as a standard pitot tube and methane concentration (percent by volume) using a hydrocarbon detector meeting the requirements of 95471(a). The total landfill gas flow rate must be multiplied by the methane concentration and then multiplied by the gross heating value (GHV) of methane of 1,012 Btu/scf to determine the landfill gas heat input capacity.
  - (3) *MSW Landfills with Passive Venting Systems:* The landfill gas heat input capacity must be determined pursuant to both of the following and is the higher of those determined values:
    - (A) Section 95471(b)(1); and
    - (B) The owner or operator must measure actual landfill gas flow rates (in units of scfm) by using a flow measuring device such as a standard pitot tube and methane concentration (percent by volume) using a hydrocarbon detector meeting the requirements of 95471(a) from each venting pipe that is within the waste mass. Each gas flow rate must then be multiplied by its corresponding methane concentration to obtain the individual methane flow rate. The individual methane flow rates must be added together and then multiplied by the GHV of methane of 1,012 Btu/scf to determine the landfill gas heat input capacity.
- (c) *Surface Emissions Monitoring Procedures:* The owner or operator must measure the landfill surface concentration of methane using a hydrocarbon detector meeting the requirements of section 95471(a). The landfill surface must be inspected using the following procedures:
- (1) *Monitoring Area:* The entire landfill surface must be divided into individually identified 50,000 square foot grids. The grids must be used for both instantaneous and integrated surface emissions monitoring.
    - (A) Testing must be performed by holding the hydrocarbon detector's probe within 3 inches of the landfill surface while traversing the grid.
    - (B) The walking pattern must be no more than a 25-foot spacing interval and must traverse each monitoring grid.



1. If the owner or operator has no exceedances of the limits specified in section 95465 after any four consecutive quarterly monitoring periods, the walking pattern spacing may be increased to 100-foot intervals. The owner or operator must return to a 25-foot spacing interval upon any exceedances of the limits specified in section 95465 that cannot be remediated within 10 calendar days or upon any exceedances detected during a compliance inspection.
  2. If an owner or operator of a MSW landfill can demonstrate that in the past three years before the effective date of this subarticle that there were no measured exceedances of the limit specified in section 95465(a)(1) by annual or quarterly monitoring, the owner or operator may increase the walking pattern spacing to 100-foot intervals. The owner or operator must return to a 25-foot spacing interval upon any exceedances of the limits specified in section 95465 that cannot be remediated within 10 calendar days or upon any exceedances detected during a compliance inspection.
- (C) Surface testing must be terminated when the average wind speed exceeds five miles per hour or the instantaneous wind speed exceeds 10 miles per hour. The Executive Officer may approve alternatives to this wind speed surface testing termination for MSW landfills consistently having measured winds in excess of these specified limits. Average wind speed must be determined on a 15-minute average using an on-site anemometer with a continuous recorder for the entire duration of the monitoring event.
- (D) Surface emissions testing must be conducted only when there has been no measurable precipitation in the preceding 72 hours.
- (2) *Instantaneous Surface Emissions Monitoring Procedures.*
- (A) The owner or operator must record any instantaneous surface readings of methane 200 ppmv or greater, other than non-repeatable, momentary readings.
  - (B) Surface areas of the MSW landfill that exceed a methane concentration limit of 500 ppmv must be marked and remediated pursuant to section 95469(a)(1).
  - (C) The wind speed must be recorded during the sampling period.

- (D) The landfill surface areas with cover penetrations, distressed vegetation, cracks or seeps must also be inspected visually and with a hydrocarbon detector.
- (3) *Integrated Surface Emissions Monitoring Procedures.*
- (A) Integrated surface readings must be recorded and then averaged for each grid.
  - (B) Individual monitoring grids that exceed an average methane concentration of 25 ppmv must be identified and remediated pursuant to section 95469(a)(2).
  - (C) The wind speed must be recorded during the sampling period.
- (d) *Gas Collection and Control System Leak Inspection Procedures.* Leaks must be measured using a hydrocarbon detector meeting the requirements of 95471(a).
- (e) *Determination of Expected Gas Generation Flow Rate.* The expected gas generation flow rate must be determined as prescribed in the 2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories, Chapter 3, which is incorporated by reference herein, using a recovery rate of 75 percent.
- (f) *Control Device Destruction Efficiency Determination.* The following methods of analysis must be used to determine the efficiency of the control device in reducing methane:
- (1) *Enclosed Combustors:* One of the following test methods, all of which are incorporated by reference herein (and all as promulgated in 40 CFR, Part 60, Appendix A, as last amended 65 Fed.Reg. 61744 (October 17, 2000) at the pages cited below must be used to determine the efficiency of the control device in reducing methane by at least 99 percent, or in reducing the outlet methane concentration for lean burn engines to less than 3,000 ppmv, dry basis, corrected to 15 percent oxygen:
    - U.S. EPA Reference Method 18, Measurement of Gaseous Organic Compound Emissions By Gas Chromatography (65 Fed.Reg. at 62007);
    - U.S. EPA Reference Method 25, Determination of Total Gaseous Nonmethane Organic Emissions as Carbon (65 Fed.Reg. at 62044);
    - U.S. EPA Reference Method 25A, Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer (65 Fed.Reg. at 62062); or

U.S. EPA Reference Method 25C, Determination of Nonmethane Organic Compounds in Landfill Gases (65 Fed.Reg. at 62066).

The following equation must be used to calculate destruction efficiency:

$$\text{Destruction Efficiency} = \left[ 1 - \left( \frac{\text{Mass of Methane - Outlet}}{\text{Mass of Methane - Inlet}} \right) \right] \times 100\%$$

- (2) *Open Flares:* Open flares must meet the requirements of 40 CFR § 60.18 (as last amended 73 Fed.Reg. 78209 (December 22, 2008)).
- (g) *Determination of Gauge Pressure.* Gauge pressure must be determined using a hand-held manometer, magnahelic gauge, or other pressure measuring device approved by the Executive Officer. The device must be calibrated and operated in accordance with the manufacture's specifications.
- (h) *Alternative Test Methods.* Alternative test methods may be used provided that they are approved in writing by the Executive Officer.

Note: Authority cited: Sections 38501, 38510, 38560, 38560.5, 38580, 39600, and 39601, Health and Safety Code. Reference: Sections 38501, 38505, 38510, 38550, 38551, 38560, 38560.5, 39003, 39500, 39600, and 39601, Health and Safety Code.

## § 95472. Penalties

- (a) Penalties may be assessed for any violation of this subarticle pursuant to Health and Safety Code section 38580. Each day during any portion of which a violation occurs is a separate offense.
- (b) Any violation of this subarticle may be enjoined pursuant to Health and Safety Code section 41513.
- (c) Each day or portion thereof that any report, plan, or document required by this subarticle remains unsubmitted, is submitted late, or contains incomplete or inaccurate information, shall constitute a single, separate violation of this subarticle.

Note: Authority cited: Sections 38501, 38510, 38560, 38560.5, 38580, 39600, and 39601, Health and Safety Code. Reference: Sections 38501, 38505, 38510, 38550, 38551, 38560, 38560.5, 39003, 39500, 39600, and 39601, Health and Safety Code.

**§ 95473. Implementation, Enforcement, and Related Fees**

- (a) The Executive Officer, at his or her discretion, may enter into an agreement with a District to implement and enforce this subarticle. Pursuant to this agreement, an owner or operator of a MSW landfill must pay any fees assessed by a District for the purpose of recovering the District's cost of implementing and enforcing the requirements of this subarticle. Implementation and enforcement of other law as described in Section 95474 cannot result in a standard, requirement, or prohibition less stringent than provided in this subarticle, as determined by the Executive Officer.
- (b) The Executive Officer may request any owner or operator to demonstrate that a landfill does not meet the applicability criteria specified in this subarticle. Such demonstration must be submitted to the Executive Officer within 90 days of a written request received from the Executive Officer.

Note: Authority cited: Sections 38501, 38510, 38560, 38560.5, 38580, 39600, and 39601, Health and Safety Code. Reference: Sections 38501, 38505, 38510, 38550, 38551, 38560, 38560.5, 39003, 39500, 39600, 39601, and 40001(a), Health and Safety Code.

**§ 95474. Applicability of Other Rules and Regulations**

Compliance with this regulation does not exempt a person from complying with other federal, State, or local law, including but not limited to, California Health and Safety Code Section 41700; rules pertaining to visible emissions, nuisance, or fugitive dust, or from permitting requirements of a District, the Regional Water Quality Control Board, local enforcement agencies, the Integrated Waste Management Board, and other local, State, and federal agencies.

Note: Authority cited: Sections 38501, 38510, 38560, 38560.5, 38580, 39600, and 39601, Health and Safety Code. Reference: Sections 38501, 38505, 38510, 38550, 38551, 38560, 38560.5, 39003, 39500, 39600, 39601, and 40001(a), Health and Safety Code.

**§ 95475. Definitions**

- (a) For purposes of this subarticle, the following definitions apply:
  - (1) "Active MSW Landfill" means a MSW landfill that is accepting solid waste for disposal.
  - (2) "Component Leak" means the concentration of methane measured one half of an inch or less from a component source that exceeds 500 parts per million by volume (ppmv), other than non-repeatable, momentary readings. Measurements from any vault must be taken within 3 inches above the surface of the vault exposed to the atmosphere.

- (3) "Component" means any equipment that is part of the gas collection and control system and that contains landfill gas including, but not limited to, wells, pipes, flanges, fittings, valves, flame arrestors, knock-out drums, sampling ports, blowers, compressors, or connectors.
- (4) "Construction and Demolition Wastes" means waste building materials, packaging and rubble resulting from construction, remodeling, repair and demolition operations on pavements, houses, commercial buildings and other structures.
- (5) "Continuous Operation" means that the gas collection and control system is operated continuously; the existing gas collection wells are operating under vacuum while maintaining landfill gas flow, and the collected landfill gas is processed by a gas control system 24 hours per day.
- (6) "Closed MSW Landfill" means that a MSW landfill is no longer accepting solid waste for disposal and has documentation that the closure was conducted in accordance with the applicable statutes, regulations, and local ordinances in effect at the time of closure.
- (7) "District" means any air quality management district or air pollution control district in the State of California.
- (8) "Destruction Efficiency" means a measure of the ability of a gas control device to combust, transform, or otherwise prevent emissions of methane from entering the atmosphere.
- (9) "Enclosed Combustor" means an enclosed flare, steam generating boiler, internal combustion engine, or gas turbine.
- (10) "Energy Recovery Device" means any combustion device that uses landfill gas to recover energy in the form of steam or electricity, including, but not limited to, gas turbines, internal combustion engines, boilers, and boiler-to-steam turbine systems.
- (11) "Exceedance" means the concentration of methane measured within 3 inches above the landfill surface that exceeds 500 ppmv, other than non-repeatable, momentary readings, as determined by instantaneous surface emissions monitoring; or the average methane concentration measurements that exceed 25 ppmv, as determined by integrated surface emissions monitoring.
- (12) "Executive Officer" means the Executive Officer of the Air Resources Board, or his or her delegate.

- (13) "Facility Boundary" means the boundary surrounding the entire area on which MSW landfill activities occur and are permitted.
- (14) "Gas Control Device" means any device used to dispose of or treat collected landfill gas, including, but not limited to, enclosed flares, internal combustion engines, boilers and boiler-to-steam turbine systems, fuel cells, and gas turbines.
- (15) "Gas Collection System" means any system that employs various gas collection wells and connected piping, and mechanical blowers, fans, pumps, or compressors to create a pressure gradient and actively extract landfill gas.
- (16) "Gas Control System" means any system that disposes of or treats collected landfill gas by one or more of the following means: combustion, gas treatment for subsequent sale, or sale for processing offsite, including for transportation fuel and injection into the natural gas pipeline.
- (17) "Inactive MSW Landfill" means a MSW landfill that is no longer accepting solid waste for disposal, or can document that the landfill is no longer receiving solid waste.
- (18) "Inert Waste" means any material meeting the definition of "Inert Waste" as defined in Title 27, California Code of Regulations, Division 2, Subdivision 1, Chapter 3, Subchapter 2, Article 2, Section 20230(a) (effective July 18, 1997).
- (19) "Landfill Gas" means any untreated, raw gas derived through a natural process from the decomposition of organic waste deposited in a MSW landfill, from the evolution of volatile species in the waste, or from chemical reactions of substances in the waste.
- (20) "Landfill Surface" means the area of the landfill under which decomposable solid waste has been placed, excluding the working face.
- (21) "Municipal Solid Waste Landfill" or "MSW Landfill" means an entire disposal facility in a contiguous geographical space where solid waste is placed in or on land.
- (22) "Non-decomposable Solid Waste" means materials that do not degrade biologically to form landfill gas. Examples include, but are not limited to, earth, rock, concrete asphalt paving fragments, uncontaminated concrete (including fiberglass or steel reinforcing rods embedded in the concrete), brick, glass, ceramics, clay products, inert slag, asbestos-containing waste, and demolition materials containing minor amounts (less than

10 percent by volume) of wood and metals. Materials that do not meet this definition are considered decomposable solid waste.

- (23) "Non-repeatable, Momentary Readings" means indications of the presence of methane, which persist for less than five seconds and do not recur when the sampling probe of a portable gas detector is placed in the same location.
- (24) "Operator" means any person or entity, including but not limited to any government entity, corporation, partnership, trustee, other legal entity, or individual that:
- (A) Operates the MSW landfill;
  - (B) Is responsible for complying with any federal, state, or local requirements relating to methane emissions from real property used for MSW landfill purposes and subject to this subarticle;
  - (C) Operates any stationary equipment for the collection of landfill gas;
  - (D) Purchases landfill gas from an owner or operator of a MSW landfill and operates any stationary equipment for the treatment of landfill gas; or
  - (E) Purchases untreated landfill gas from an owner or operator of a MSW landfill and operates any stationary equipment for the combustion of landfill gas.
- (25) "Owner" means any person or entity, including but not limited to any government entity, corporation, partnership, trustee, other legal entity, or individual that:
- (A) Holds title to the real property on which the MSW landfill is located, including but not limited to title held by joint tenancy, tenancy in common, community property, life estate, estate for years, lease, sublease, or assignment, except title held solely as security for a debt such as mortgage;
  - (B) Is responsible for complying with any federal, state, or local requirements relating to methane emissions from real property used for MSW landfill purposes and subject to this subarticle.
  - (C) Owns any stationary equipment for the collection of landfill gas;

- (D) Purchases the landfill gas from an owner or operator of a MSW landfill and owns any stationary equipment for the treatment of landfill gas; or
  - (E) Purchases untreated landfill gas from an owner or operator of a MSW landfill and owns any stationary equipment for the combustion of landfill gas.
- (26) "Perimeter" means along the MSW landfill's permitted facility boundary.
- (27) "Professional Engineer" means an engineer holding a valid certificate issued by the State of California Board of Registration for Professional Engineers and Land Surveyors or an engineer holding a valid certificate issued by a state offering reciprocity with California.
- (28) "Solid Waste" means all decomposable and non-decomposable solid, semisolid, and liquid wastes, including garbage, trash, refuse, paper, rubbish, ashes, industrial waste, manure, vegetable or animal solid and semisolid wastes, sludge, and other discarded solid and semisolid wastes. Solid waste also includes any material meeting the definition of Solid Waste in 40 CFR § 60.751 (as last amended 64 Fed.Reg 9262, Feb 24, 1999) as incorporated by reference herein.
- (29) "Subsurface Gas Migration" means underground landfill gases that are detected at any point on the perimeter pursuant to California Code of Regulations title 27, section 20921.
- (30) "Waste-in-Place" means the total amount of solid waste placed in the MSW landfill estimated in tons. The refuse density is assumed to be 1,300 pounds per cubic yard and the decomposable fraction is assumed to be 70 percent by weight.
- (31) "Well Raising" means a MSW landfill activity where an existing gas collection well is temporarily disconnected from a vacuum source, and the non-perforated pipe attached to the well is extended vertically to allow the addition of a new layer of solid waste or the final cover; or is extended horizontally to allow the horizontal extension of an existing layer of solid waste or cover material. The extended pipe (well extension) is then re-connected in order to continue collecting gas from that well.
- (32) "Working Face" means the open area where solid waste is deposited daily and compacted with landfill equipment.

Note: Authority cited: Sections 38501, 38510, 38560, 38560.5, 38580, 39600, and 39601, Health and Safety Code. Reference: Sections 38501, 38505, 38510, 38550, 38551, 38560, 38560.5, 39003, 39500, 39600, and 39601, Health and Safety Code.



**§ 95476. Severability**

Each part of this subarticle is deemed severable, and in the event that any part of this subarticle is held to be invalid, the remainder of this subarticle continues in full force and effect.

Note: Authority cited: Sections 38501, 38510, 38560, 38560.5, 38580, 39600, and 39601, Health and Safety Code. Reference: Sections 38501, 38505, 38510, 38550, 38551, 38560, 38560.5, 39003, 39500, 39600, and 39601, Health and Safety Code.

## APPENDIX I

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### 1.0 Calculate Heat Input Capacity

Heat Input Capacity (MMBtu/hr) = Methane Gas Generation (scfm)  
x 60 minutes/1 hour x Collection Efficiency x GHV x 1  
MMBtu/1,000,000 Btu

Where:

Collection Efficiency = the landfill gas collection efficiency in percent (%), which is 75 percent.

GHV (Gross Heating Value) = Gross heating value of methane, which is 1,012 in units of British thermal units per standard cubic feet, or Btu/scf; source: <http://epa.gov/lmop/res/converter.htm>.

**2.0 Methane Gas Generation:** CH<sub>4</sub> Generation is calculated using the following equation:

$$CH_4 \text{ Generation (Mg of CH}_4) = \frac{\{ANDOC_{\text{year-start}} \times [1 - e^{-k}] - ANDOC_{\text{deposited-last year}} \times [1/k \times (e^{-k \times (1-M/12)} - e^{-k})] - (M/12) \times e^{-k}\} + ANDOC_{\text{deposited-same year}} \times [1 - ((1/k) \times (1 - e^{-k \times (1-M/12)}) + (M/12))]}{FCH_4}$$

Where:

CH<sub>4</sub> Generation = CH<sub>4</sub> generated in the inventory year in question (Mg of CH<sub>4</sub>) using the Mathematically Exact First-Order Decay Model provided in the 2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories, Chapter 3 (Source: [http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/5\\_Volume5/V5\\_3\\_Ch3\\_SWDS.pdf](http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/5_Volume5/V5_3_Ch3_SWDS.pdf)).

FCH<sub>4</sub> = Fraction of decomposing carbon converted into CH<sub>4</sub> (Default = 0.5)

ANDOC<sub>year-start</sub> = ANDOC in place at the beginning of the inventory year in question

ANDOC<sub>deposited-last year</sub> = ANDOC deposited during the previous inventory year

ANDOC<sub>deposited-same year</sub> = ANDOC deposited during the inventory year in question

### 3.0 To Convert Methane Generated from Mg of CH<sub>4</sub> to SCFM

$CH_4$  Gas Generated (scfm) =  $CH_4$  Generation (Mg/year) x  
1 year/ 525,600 minutes x 1,000,000 g/Mg x 1 mole CH<sub>4</sub>/16.04246 g CH<sub>4</sub> x  
0.83662 SCF/mole landfill gas

### 4.0 Define ANDOC%

$$ANDOC\% = \sum WIPFRAC_i \times TDOC_i \times DANF_i$$

Where:

WIPFRAC<sub>i</sub> = Fraction of the i<sup>th</sup> component in the waste-in-place

TDOC<sub>i</sub> = Total Degradable Organic Carbon fraction of the i<sup>th</sup> waste component (Mg of that component/Mg of Total waste-in-place)

DANF<sub>i</sub> = Decomposable Anaerobic Fraction of the i<sup>th</sup> waste component, that fraction capable of decomposition in anaerobic conditions (Mg of decomposable carbon for that component/Mg TDOC<sub>i</sub> for that component)

### 5.0 Define ANDOC

$$ANDOC = WIP \text{ (Tons)} \times 0.9072 \text{ (Mg/Ton)} \times ANDOC\%$$

Where:

ANDOC = Anaerobically Degradable Organic Carbon, carbon that is capable of decomposition in an anaerobic environment (Mg of carbon)

WIP = Waste-in-Place estimate of all the landfilled waste (wet weight) as reported to the CIWMB (tons)

### 6.0 Calculate ANDOC<sub>year-end</sub>

$$ANDOC_{year-end} = ANDOC_{year-start} \times e^{-[k]} + ANDOC_{deposited-last\ year} \times \left[ \frac{1}{k} \times (e^{-[k \times (1-M/12)]} - e^{-[k]}) - (M/12) \times e^{-[k]} \right] + ANDOC_{deposited-same\ year} \times \left[ \left( \frac{1}{k} \right) \times (1 - e^{-[k \times (1-M/12)]}) + (M/12) \right]$$

Where:

ANDOC<sub>year-end</sub> = ANDOC remaining undecomposed at the end of the inventory year in question

$ANDOC_{year-start}$  = ANDOC in place at the beginning of the inventory year in question

$ANDOC_{deposited-last\ year}$  = ANDOC deposited during the previous inventory year

$ANDOC_{deposited-same\ year}$  = ANDOC deposited during the inventory year in question

M = Assumed delay before newly deposited waste begins to undergo anaerobic decomposition (Months, Default = 6)

k = Assumed rate constant for anaerobic decomposition;  
k =  $\ln 2 / \text{half-life (years)}$ ; half-life is the number of years required for half of the original mass of carbon to degrade

The following values for the assumed rate constant for anaerobic decomposition (or "k") must be used:

**Table 1. Average Rainfall and k Values**

Average Rainfall (Inches/Year)	k Value
<20	0.020
20-40	0.038
>40	0.057

Source: U.S. EPA

<http://www.ncgc.nrcs.usda.gov/products/datasets/climate/data/precipitation-state/>.

The following waste characterization default values shown in Tables 1A, 1B, 2, and 3 in addition to the model equations must be used in estimating the methane generation potential for a MSW landfill:

<b>Table 1A</b>	<b>Waste Type (%) by Year</b>				
<b>Waste Type</b>	<b>Up to 1964</b>	<b>1965-1974</b>	<b>1975-1984</b>	<b>1985-1992</b>	<b>1993-1995</b>
Newspaper	6.4%	6.4%	5.9%	4.8%	3.9%
Office Paper	10.7%	11.3%	12.0%	13.1%	15.0%
Corrugated Boxes	10.8%	13.5%	11.5%	10.5%	10.3%
Coated Paper	2.2%	2.0%	2.4%	2.1%	1.8%
Food	14.8%	11.3%	9.5%	12.1%	13.4%
Grass	12.1%	10.3%	10.1%	9.0%	6.6%
Leaves	6.1%	5.1%	5.0%	4.5%	3.3%
Branches	6.1%	5.1%	5.0%	4.5%	3.3%
Lumber	3.7%	3.3%	5.1%	7.0%	7.3%
Textiles	2.1%	1.8%	1.7%	3.3%	4.5%
Diapers	0.1%	0.3%	1.4%	1.6%	1.9%
Construction/Demolition	2.6%	2.5%	3.5%	3.9%	4.5%
Medical Waste	0.0%	0.0%	0.0%	0.0%	0.0%
Sludge/Manure	0.0%	0.0%	0.0%	0.0%	0.0%

Source: US EPA Municipal Solid Waste publication: <http://www.epa.gov/msw/pubs/03data.pdf>.

Table 1B Waste Type	Waste Type (%) by Year	
	1996-2002 <sup>1</sup>	2003-present <sup>2</sup>
Newspaper	4.3%	2.2%
Office Paper	4.4%	2.0%
Corrugated Boxes	4.6%	5.7%
Coated Paper	16.9%	11.1%
Food	15.7%	14.6%
Grass	5.3%	2.8%
Leaves	2.6%	1.4%
Branches	2.4%	2.6%
Lumber	4.9%	9.6%
Textiles	2.1%	4.4%
Diapers	6.9%	4.4%
Construction/Demolition	6.7%	12.1%
Medical Waste	0.0%	0.0%
Sludge/Manure	0.1%	0.1%
Source: <sup>1</sup> CIWMB Statewide Waste Characterization Study (1999). <sup>2</sup> CIWMB Statewide Waste Characterization Study (2004).		

Table 2 Waste Type	TDOC	Source
Newspaper	46.5%	EPA
Office Paper	39.8%	EPA
Corrugated Boxes	40.5%	EPA
Coated Paper	40.5%	EPA
Food	11.7%	EPA
Grass	19.2%	EPA
Leaves	47.8%	EPA
Branches	27.9%	EPA
Lumber	43.0%	IPCC
Textiles	24.0%	IPCC
Diapers	24.0%	IPCC
Construction/Demolition	4.0%	IPCC
Medical Waste	15.0%	IPCC
Sludge/Manure	5.0%	IPCC
Sources EPA <i>Solid Waste Management and Greenhouse Gases: A Life-Cycle Assessment of Emissions and Sinks</i> , Exhibits 7-2, 7-3 (May 2002). IPCC <i>Guidelines for National Greenhouse Gas Inventories</i> , Chapter 2, Table 2.4, 2.5 and 2.6 (2006).		

<b>Table 3</b>		
<b>Waste Type</b>	<b>DANF</b>	<b>Source</b>
Newspaper	16.1%	EPA
Office Paper	87.4%	EPA
Corrugated Boxes	38.3%	EPA
Coated Paper	21.0%	EPA
Food	82.8%	EPA
Grass	32.2%	EPA
Leaves	10.0%	EPA
Branches	17.6%	EPA
Lumber	23.3%	CEC
Textiles	50.0%	IPCC
Diapers	50.0%	IPCC
Construction/Demolition	50.0%	IPCC
Medical Waste	50.0%	IPCC
Sludge/Manure	50.0%	IPCC
Sources: EPA <i>Solid Waste Management and Greenhouse Gases: A Life-Cycle Assessment of Emissions and Sinks</i> Exhibits 7-2, 7-3 (May 2002). CEC <i>Inventory of California Greenhouse Gas Emissions and Sinks: 1990-2004</i> (December 2006). IPCC <i>Guidelines for National Greenhouse Gas Inventories</i> , Chapter 3, 3.13 (2006).		



# Air Resources Board



Linda S. Adams  
Acting Secretary for  
Environmental Protection

Mary D. Nichols, Chairman  
1001 I Street • P.O. Box 2815  
Sacramento, California 95812 • [www.arb.ca.gov](http://www.arb.ca.gov)

Edmund G. Brown Jr.  
Governor

July 28, 2011

Dear Air Pollution Control Officer or Executive Officer:

**Implementation and Enforcement of California's Regulation to Reduce Methane Emissions from Municipal Solid Waste Landfills**

On June 25, 2009, the Air Resources Board (ARB) approved a new regulation that reduces emissions of methane, a greenhouse gas, from municipal solid waste (MSW) landfills. The regulation is a discrete early action greenhouse gas emission reduction measure, as described in the California Global Warming Solutions Act of 2006 (AB 32). The regulation, which became effective on June 17, 2010, primarily requires owners and operators of certain uncontrolled MSW landfills to install gas collection and control systems, and requires existing and newly installed gas and control systems to operate in an optimal manner. A hardcopy of the regulation can be downloaded from ARB's website at: <http://www.arb.ca.gov/regact/2009/landfills09/landfillfinalfro.pdf>.

The regulation allows the air pollution control and air quality management districts (districts) to voluntarily enter into a memorandum of understanding (MOU) with ARB to implement and enforce the regulation and to assess fees to cover costs. ARB has developed an MOU in consultation with representatives from the California Air Pollution Control Officers Association (CAPCOA), including the Engineering Managers Committee and several air district attorneys. A copy of the MOU is enclosed for your convenience.

The purpose of this letter is to request that you identify your plans concerning implementing and enforcing the regulation. There are three possible options, which are as follows:

1. The district does not adopt a new or amended landfill rule that is equal to or more stringent than ARB's rule, and does not want to implement or enforce the statewide regulations.
2. The district does not adopt a new or amended landfill rule that is equal or more stringent than ARB's rule, but does want to implement and enforce the statewide regulations.
3. The district adopts a new or amended landfill rule that is equal to or more stringent than ARB's rule and intends to implement and enforce it.

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



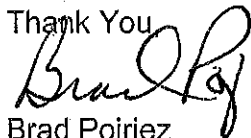
3. The district adopts a new or amended landfill rule that is equal to or more stringent than CARB's rule and intends to implement and enforce it.

The District took to task the review and evaluation of all existing and newly proposed landfills in Imperial County in order to determine the effect, if any, that the newly adopted CARB rule would have upon the local landfills. The analysis indicated and the District concluded that the majority of all affected landfills currently have existing permits with the District and as such are subject to yearly inspections. Furthermore, of those landfills already under permit, all would fall under the new requirements as established by CARB causing a potential duplication of inspections, conditions, reporting and expense. In order to avoid the burden of duplication to all local sources impacted by the newly adopted CARB regulation District staff strongly recommended retaining control at the local level. By retaining local control currently permitted landfills would be required to report only to one agency avoiding duplication of effort, time and expense. In addition, the analysis also indicated that adopting a separate rule was not necessary as the landfills, as analyzed would not be exempt from reporting and adopting a separate rule would only duplicate what has already gone through public review and environmental analysis. Therefore, options 1 and 3 are not recommended.

Option 2 is recommended by District staff. Soon after our review and evaluation CARB was notified by the due date of August 15, 2011 of the intent to enter into an MOU with CARB. The District expressed its intention to present option 2, entering into an MOU with CARB as the most reasonable option for Imperial County to its Air District Board at the most earliest practicable date. CARB agreed.

As a final note, this MOU was reviewed by County Counsel and approved as to form on February 23, 2012. In addition, the creation of the MOU went through review by the California Air Pollution Control Officers Association (CAPCOA) attorney's committee and the CARB attorneys over the course of a year culminating in the approval by the CAPCOA board.

Thank You



Brad Poiriez  
Air Pollution Control Officer

**MINUTE ORDER  
OF  
AIR POLLUTION  
CONTROL BOARD**

<b>Date:</b> March 20, 2012	<b>Book:</b> 405	<b>Page:</b> 378	<b>File #:</b> 300.12	<b>M.O.#:</b> 17
<b>X-File 1:</b>	<b>X-File 2:</b>	<b>X-File 3:</b>	<b>X-File 4:</b>	
<b>Department:</b> APCD		<b>2nd Page:</b>		

THE BOARD OF SUPERVISORS OF THE COUNTY OF IMPERIAL, STATE OF CALIFORNIA, on a motion by Supervisor : RENISON , second by Supervisor : WYATT and approved by the following roll call vote;

**AYES :** RENISON, TERRAZAS, KELLEY, WYATT, CASTILLO

**NAYES :** NONE

**ABSTAINED :** NONE

**EXCUSED OR ABSENT :** NONE

**IN REFERENCE TO :**

Approve and authorize the Chairman of the Air Pollution Control Board to sign Memorandum of Understanding with the California Air Resources Board (CARB) to implement and enforce the CARB Regulation to reduce emissions of methane and greenhouse gases from municipal solid waste landfills.

<b>Topic:</b> MOU	<b>X-Topic:</b> Ca. Air Resources Board (CARB)																
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