

Title 27, Environmental Protection
Division 2, Solid Waste

Chapter 3 Criteria for All Waste Management Units, Facilities, and Disposal Site
Subchapter 4. Criteria for Landfills and Disposal Sites

Article 6. Gas Monitoring and Control at Active and Closed Disposal Sites

§ 20917. CIWMB - Scope and Applicability. [Reserved]

CIWMB - Scope and Applicability. [Reserved]

§ 20918. CIWMB - Exemptions.

A disposal site other than a MSWLF unit may be granted an exemption to all or any portion of the requirements of Article 6 of this Subchapter if the operator can demonstrate to the satisfaction of the EA that there is no potential for adverse impacts on public health and safety and the environment, based upon but not limited to: the amount, nature and age of refuse; projected landfill gas generation; and remoteness of the disposal site. Exemptions shall be reviewed by the EA at least every five (5) years and in conjunction with the five (5) year permit review for those sites which have a solid waste facilities permit, and, based on the results, the EA may extend or terminate the exemption. Any exemption granted by the EA shall be in writing and shall contain sufficient relevant information that justifies the exemption.

Note:

Authority cited:

Section 40502, [Public Resources Code](#).

Reference:

Sections 43020, 43021 and 43103, [Public Resources Code](#); and Title 40, Code of Federal Regulations, Section 258.23.

§ 20919. CIWMB - Gas Control.

Where the EA, the local fire control authority, the local building authority, or the CIWMB has sufficient relevant information to believe a hazard or nuisance is being or may be created by landfill gas, it shall so notify the operator. The local fire control authority and the local building authority shall also notify the EA and the CIWMB. Thereafter, as directed by the EA, the local fire control authority, the local building authority, or the CIWMB, the site operator shall cause the site to be monitored for presence and movement of landfill gas, and shall take necessary action to control such gas. The monitoring program shall be developed pursuant to the specifications of the above agencies. The monitoring program shall not be discontinued until authorized to do so in writing by the requiring agency. Results of the monitoring shall be submitted to the appropriate agencies. If monitoring indicates landfill gas movement away from the site, the operator shall, within a period of time specified by the requiring agency, construct a gas control system approved by that agency. The agency may waive this requirement if satisfactory evidence is presented demonstrating that adjacent properties are safe from hazard or nuisance caused by landfill gas movement. The operator shall duly inform the EA of possible landfill gas problems.

Note:

Authority cited:

Section 40502 [Public Resources Code](#).

Reference:

Sections 43020, 43021 and 43103, [Public Resources Code](#).

§ 20919.5 CIWMB - Explosive Gases Control. [Repealed]

§ 20920. CIWMB - Scope and Applicability for Gas Monitoring and Control Requirements.

(a) Sections 20921 through 20939 set forth the performance standards and the minimum substantive requirements for landfill gas monitoring and control as it relates to active solid waste disposal sites and to proper closure, postclosure maintenance and ultimate reuse of solid waste disposal sites to assure that public health and safety and the environment are protected from pollution due to the disposal of solid waste.

(b) Sections 20921 through 20939 apply to all of the following:

(1) Active solid waste disposal sites;

(2) Solid waste disposal sites that did not commence complete closure prior to August 18, 1989, which was fully implemented by November 18, 1990, in accordance with all applicable requirements; and

(3) New postclosure activities at any solid waste disposal site that may jeopardize the integrity of a previously closed site or pose a threat to public health and safety or the environment.

Note:

Authority cited:

Sections 40502 and 45020, [Public Resources Code](#).

Reference:

Section 43021 and 43103, [Public Resources Code](#).

§ 20921. CIWMB - Gas Monitoring and Control.

(a) To provide for the protection of public health and safety and the environment, the operator shall ensure that landfill gas generated at a disposal site is controlled in such a manner as to satisfy the following requirements:

(1) The concentration of methane gas must not exceed 1.25 percent by volume in air within any portion of any on-site structures.

(2) The concentration of methane gas migrating from the disposal site must not exceed 5 percent by volume in air at the disposal site permitted facility boundary or an alternative boundary approved in accordance with §20925.

(3) Trace gases shall be controlled to prevent adverse acute and chronic exposure to toxic and/or carcinogenic compounds.

(b) The EA, with concurrence by the CIWMB, shall evaluate and, if it complies with the requirements of §§20921-20939 to the satisfaction of the EA and CIWMB, approve a gas monitoring and control program submitted by the disposal site operator. The timeline for concurrence by the CIWMB shall be consistent with the timelines for processing of solid waste facilities permits (27 CCR 21685) and review and approval of closure and postclosure maintenance plans (27 CCR 21860), as appropriate. For CIWMB reviews conducted outside of the SWFP and closure and postclosure maintenance plans processes, the CIWMB shall act upon the submittal by concurring, denying, or requesting additional information within 60 days of receipt of the submittal; if the CIWMB does not act upon the submittal within 60 days, the submittal will be deemed to have been concurred with.

(1) New disposal sites and lateral expansions of existing disposal sites shall comply with these regulations prior to receipt of waste in the new or **expanded** area.

(2) Disposal sites which have received their final shipment of waste shall comply with these regulations immediately. Disposal sites which are actively implementing final closure activities at the time these regulations become effective shall comply with these regulations in accordance with the time schedule contained in the approved final closure plan.

(3) Existing disposal sites which have not yet received their final shipment of waste shall comply with these regulations in accordance with the following schedule.

(A) For disposal sites which are permitted to receive greater than 20 tons of waste per operating day shall comply with these regulations by September 21, 2008.

(B) For disposal sites which are permitted to accept less than or equal to 20 tons of waste per operating day shall comply with these regulations by September 21, 2009.

(c) The gas monitoring and control program implemented pursuant to §§20921-20939 shall continue until the operator receives written authorization to discontinue by the EA with concurrence by the CIWMB pursuant to 40 CFR 258.61(b). Authorization to cease gas monitoring and control shall be based on a demonstration by the operator that there is no potential for gas migration beyond the disposal site permitted facility boundary or into on-site structures. The operator's demonstration of this proposal shall be supported by data collected and any necessary studies.

(d) The gas monitoring and control program required pursuant to §§20921-20939, shall be included in the JTD and preliminary and final closure and postclosure maintenance plans. The implementation of the gas

monitoring and control program shall be described in detail in the JTD and the preliminary and final closure and postclosure maintenance plans to the satisfaction of the EA and CIWMB.

(e) The gas monitoring and control program shall be modified, during the operation and closure and postclosure maintenance periods to reflect changing on-site and adjacent land uses. Postclosure land use at the site shall not interfere with the function of gas monitoring and control systems. The operator may request a reduction of monitoring or control activities based upon the results of monitoring data collected. The request for reduction of monitoring or control activities shall be submitted in writing to the EA and CIWMB.

(f) For the purposes of this article, for disposal sites that do not have a solid waste facilities permit, the disposal site permitted facility boundary shall be as defined in the most recently approved closure and/or postclosure maintenance plan or other appropriate document (e.g., assessor's parcel map).

Note:

Authority cited:

Sections 40502 and 45020, [Public Resources Code](#).

Reference:

Section 43021 and 43103, [Public Resources Code](#).

§ 20923. CIWMB - Monitoring

(a) To ensure that the conditions of §20921 are met, the operator shall implement a gas monitoring and control program at the disposal site that satisfies the following requirements:

(1) the gas monitoring network shall be designed by a registered civil engineer or a certified engineering geologist and shall ensure detection of the presence of landfill gas migrating beyond the disposal site permitted facility boundary and also into on-site structures; and

(2) The monitoring network shall be designed to account for the following specific site characteristics and potential migration pathways or barriers, including, but not limited to:

(A) local soil and rock conditions;

(B) hydrogeological conditions at the disposal site;

(C) the hydraulic conditions surrounding the disposal site;

(D) locations of buildings and structures relative to the waste disposal area;

(E) adjacent land use and inhabitable structures within 1000 feet of the disposal site permitted facility boundary;

(F) man-made pathways, such as underground construction; and

(G) the nature and age of the waste and its potential to generate landfill gas.

Note:

Authority Cited:

Sections 40502 and 45020, [Public Resources Code](#).

Reference:

Section 43201 and 43103, [Public Resources Code](#) and Title 40, Code of Federal Regulations, Section 258.23.

History

See Title 14 for 4. points of history.

§ 20925. CIWMB - Perimeter Monitoring Network.

(a) Location

(1) Perimeter subsurface monitoring wells shall be installed around the waste disposal footprint but not within refuse. In some cases the installation of monitoring wells may not be necessary around the entire perimeter of the disposal site permitted facility boundary. In such a case, the operator shall demonstrate to the satisfaction of the EA that landfill gas migration could not occur due to geologic barriers and that no inhabitable structure or other property or land use, such as agricultural lands, within 1,000 feet of the disposal site permitted facility boundary is threatened by landfill gas migration.

(2) Perimeter monitoring wells shall be located at or near the disposal site permitted facility boundary. The operator may establish an alternate boundary closer to the waste disposal footprint based on a knowledge of the site factors in §20923(a)(2). When compliance levels are exceeded at the alternate boundary, the operator shall install additional monitoring wells closer to the permitted facility boundary, pursuant to §20937.

(b) Spacing

(1) The lateral spacing between adjacent monitoring wells shall not exceed 1,000 feet unless the operator demonstrates to the satisfaction of the EA and CIWMB, based on the factors specified in §20923(a)(2), that there is no potential for adverse impacts on the public health and safety and the environment from such wider spacing.

(2) The spacing of monitoring wells shall be determined based upon, but not limited to: the nature of the structure to be protected and its proximity to the refuse. Wells shall be spaced to align with gas permeable structural or stratigraphic features, such as dry sand or gravel, off site or on site structures, and areas of dead or stressed vegetation that might be caused by landfill gas migration.

(3) Monitoring well spacing shall be reduced as necessary to protect persons and structures threatened by landfill gas migration.

(c) Depth

(1) The depth of the wellbore of all monitoring wells shall equal the maximum depth of waste. The number and depths of monitoring probes within the wellbore shall be installed in accordance with the following criteria, except as specified in ¶(c)(2) of this section.

(A) a shallow probe shall be installed 5 to 10 feet below the surface;

(B) an intermediate probe shall be installed at or near half the depth of the waste;

(C) a deep probe shall be set at or near the depth of the waste;

(D) the specified depths of monitoring probes within the wellbore shall be adjusted based on geologic data obtained during drilling, and probes shall be placed adjacent to soils which are most conducive to gas flow;

(E) All probes shall be installed above the permanent low seasonal water table, above and below perched ground water, and above bedrock; and

(F) When the depth of the waste does not exceed 30 feet, the operator may reduce the number of probes to two, with one probe located in the shallow zone as indicated above and the other located adjacent to permeable soils at or near the depth of the waste.

(2) Exclusions or modifications to the requirements specified in ¶(c)(1) of this section may be requested when conditions limit the practicality or do not warrant the installation depth criteria (e.g., filled pits, cut and trench, and canyon fills). In those cases, the operator shall propose an alternate system of equivalent probe depths. The proposal must demonstrate to the satisfaction of the EA and CIWMB that probes located at these depths are sufficient to detect migrating landfill gas and provide protection to public health and safety and the environment.

(3) The EA may require an increase in the number of monitoring wells or probes or the depth of the wellbore or modify the depths of monitoring probes within a wellbore to ensure compliance with §20921(a). The operator is not precluded from utilizing existing gas monitoring wells of an alternate design when the operator demonstrates to the satisfaction of the EA and CIWMB that such wells have been installed in a manner that ensures the detection of landfill gas migrating from the disposal site.

(d) Monitoring Well Construction

(1) Monitoring wells shall be drilled by a licensed drilling contractor or by a drilling crew under the supervision of the design engineer or engineering geologist. Wells shall be logged during drilling by a geologist or geotechnical engineer. Soils shall be described using the ASTM Designation: D2488-84 method for visual classification, Standard Practice for Description and Identification of Soils (Visual Manual Procedure), which is incorporated by reference. Rock units shall be described in a manner appropriate for geologic investigation.

(2) A record of each monitoring well shall be maintained by the operator and submitted to the EA upon request. The record shall include:

(A) a map of the disposal site drawn to a scale proposed by the design engineer or engineering geologist sufficient to show the location of all monitoring wells. Each well must be identified with a number that corresponds to the well log. Surface elevations at the wellheads shall be denoted on the map;

(B) well logs, including the names of the person(s) logging the hole; and

(C) an as-built description, including a well detail which indicates probe material and depth, extent and type of filter pack, thickness and material used for seals, extent and material used for backfill, size and interval of perforations, and a description of any shutoff valves or covers.

(3) To isolate monitored zones within the **wellbore** and prevent contamination of perched ground water and permanent ground water, the operator shall provide a minimum seal of five (5) feet of bentonite at the surface and between the monitored zones.

Note:

Authority cited:

Sections 40502 and 45020, [Public Resources Code](#).

Reference:

Section 43021 and 43103, [Public Resources Code](#).

§ 20931. CIWMB - Structure Monitoring.

(a) To ensure that the requirements of §20923(a)(1) are met, the monitoring network design shall include provisions for monitoring all structures within the disposal site permitted facility boundary, including but not limited to, buildings, subsurface vaults, utilities, or any other areas where potential landfill gas buildup may cause adverse impacts to the public health or safety or the environment.

(b) Methods for monitoring on-site structures may include, but are not limited to: periodic monitoring, utilizing either permanently installed monitoring probes or gas surveys, and continuous monitoring systems.

(c) Structures located on top of the waste disposal footprint shall be monitored on a continuous basis.

(d) When practical, structures shall be monitored after they have been closed overnight or for the weekend to allow for an accurate assessment of gas accumulation. Areas of the structure where gas may accumulate shall be monitored and may include, but are not limited to, areas in, under, beneath and around basements; crawl spaces; floor seams or cracks; and subsurface utility connections.

Note:

Authority cited:

Sections 40502 and 45020, [Public Resources Code](#).

Reference:

Section 43021 and 43103, [Public Resources Code](#).

§ 20932. CIWMB - Monitored Parameters.

(a) All monitoring wells and on-site structures shall be monitored for methane during the monitoring period. The EA may require that a sample be collected for laboratory analysis for specified trace gases when there is a possibility of acute or chronic exposure due to hazardous materials.

Note:

Authority cited:

Sections 40502 and 45020, [Public Resources Code](#).

Reference:

Section 43021 and 43103, [Public Resources Code](#).

§ 20933. CIWMB - Monitoring Frequency.

(a) At a minimum, quarterly monitoring is required.

(1) The EA may require more frequent monitoring based upon site specific factors, including those noted in §20923(a)(2), or as needed to protect public health or safety or the environment.

(2) More frequent monitoring may also be required at those locations where results of monitoring indicate that landfill gas migration is occurring or is accumulating in structures.

(3) The operator shall increase the monitoring frequency, as is necessary, to detect migrating gas and ensure compliance with §20921.

(b) For those MSWLF's that are permitted to accept for disposal 20 tons or less of municipal solid waste per day based on an annual average, the EA, with concurrence by the CIWMB, may reduce the frequencies for monitoring landfill gas after consideration of the unique characteristics of the MSWLF and its surroundings, climatic and hydrogeologic conditions, and protection of public health and safety and the environment. Any proposal by an operator for a reduced monitoring frequency shall be made available by the EA for public review for a minimum of 30 days to allow interested persons the opportunity to comment. The operator shall place in the operating record of the MSWLF documentation of the considerations, public comment, and EA approval and CIWMB concurrence for any alternative frequency. No reduced monitoring frequency shall be approved unless the EA and the CIWMB determine that the alternative monitoring schedule adequately protects the public health and safety and the environment. The Executive Director or the EA may condition, limit, suspend, or terminate an operator's use of an alternative monitoring frequency if s/he or it determines that the alternative frequency may cause harm to public health and safety or the environment.

Note:

Authority cited:

Sections 40502 and 45020, [Public Resources Code](#).

Reference:

Section 43021 and 43103, [Public Resources Code](#) and Title 40, Code of Federal Regulations, Section 258.23.

§ 20934. CIWMB - Reporting.

(a) Provided that the results of landfill gas monitoring demonstrate that none of the monitoring wells show gas concentrations in excess of the requirements specified in §20921(a), the operator shall submit the results to the EA within a time period specified by the EA but no more than within ninety (90) days of sampling. When compliance requirements are exceeded in any probe at any well, the requirements of §20937 shall apply. The monitoring reports shall include:

(1) the concentrations of methane, as measured at each probe within each well and within each on-site structure;

(2) the concentrations of specified trace gases, if required by the EA;

(3) the documentation of date, time, barometric pressure, atmospheric temperatures, general weather conditions, and probe pressures at the time the sample was taken or the probe was monitored;

(4) the names of sampling personnel, apparatus utilized, and a brief description of the methods used; and

(5) a numbering system to correlate monitoring results to a corresponding well and probe location.

Note:

Authority cited:

Sections 40502 and 45020, [Public Resources Code](#).

Reference:

Section 43021 and 43103, [Public Resources Code](#).

§ 20937. CIWMB - Reporting and Control of Excessive Gas Concentrations.

(a) When the results of landfill gas monitoring indicate concentrations of methane or trace gases in excess of the compliance requirements specified in §20921(a), the operator shall:

(1) Immediately take all steps necessary to protect public health and safety and the environment and notify the EA by telephone or electronic means.

(2) Within seven (7) days of detection of excessive landfill gas concentrations.

(A) Verify validity of results by reviewing the following:

(i) probe readings;

(ii) possible liquid interference;

(iii) control well influence; and

(iv) barometric pressure effects.

(B) Place in the operating record a description of and submit a letter to the EA that describes:

(i) the levels of methane and trace gas detected;

(ii) a brief description of the nature and extent of the problem based on information currently available;

(iii) the steps the operator has taken to protect public health and safety and the environment; and

(iv) a brief description of any further corrective actions that the operator or others need to take to adequately protect public health and safety and the environment prior to the implementation of the remediation plan described in subdivision (a)(3) below.

(3) Within 60 days of detection, implement a remediation plan approved by the EA and CIWMB for the methane gas releases, place a copy of the plan in the operating record, forward a copy of the plan to the EA and CIWMB, and notify the EA that the plan has been implemented. The plan shall describe the nature and extent of the problem and the proposed remedy.

(4) Construct a gas control system that meets the criteria of §20939, designed by a registered civil or mechanical engineer, within a period of time specified by the EA. Installation of the system shall be in accordance with a design and in a manner approved for construction by the EA in coordination, if applicable, with the RWQCB.

(b) The EA, with concurrence by the CIWMB, may establish an alternative schedule for demonstrating compliance with subdivisions (a)(2) and (3) pursuant to 40 CFR 258.23(c)(4).

(c) The EA shall forward notifications and approvals made pursuant to ¶¶(a)(1), (2) and (3) to the CIWMB.

Note:

Authority cited:

Sections 40502 and 45020, [Public Resources Code](#).

Reference:

Section 43021 and 43103, [Public Resources Code](#) and Title 40, Code of Federal Regulations, Section 258.23.

§ 20939. CIWMB - Control of Excessive Gas Concentrations.

(a) A landfill gas control system shall be designed to:

(1) Prevent methane accumulation in on-site structures from exceeding the level specified in §20921(a);

(2) Reduce methane concentrations at the disposal site permitted facility boundary to the level specified in §20921(a);

(3) Reduce trace gas concentrations to the requirement specified in §20921(a); and

(4) Provide for the collection, treatment, and disposal of landfill gas condensate produced within the disposal site. Condensate generated from landfill gas control systems shall not be recirculated into the landfill unless the landfill has a liner and a properly operating leachate collection and removal system and analysis of the condensate demonstrates, to the satisfaction of the EA, that such recirculation into the landfill will not harm the public **health or safety** or the environment and the applicable RWQCB has approved such discharge pursuant to §20200(d).

(b) Subsurface landfill gas control systems may include, but are not limited to, one or more of the following:

(1) Active perimeter or interior control systems which are designed to accommodate the maximum expected flow rate from the disposal site and provide access for system monitoring and flow rate adjustment. The control system shall be operated to ensure that gas is controlled at a sufficient rate without overpulling, to maximize control and not production, and to ensure adequate control for compliance with §20921(a).

(2) Perimeter air injection systems which shall be installed in native soil between the refuse and the area to be protected. Injection wells shall not be located in the refuse. The system shall be designed and operated to prevent air infiltration into the landfill but maintain landfill gas concentrations to compliance levels.

(3) Passive systems, including cutoff trenches, slurry walls, and vent trenches, when used shall be constructed with an impermeable geomembrane liner. The passive systems shall be installed to the depth of permanent low seasonal ground water or keyed into a low permeability layer below the limit of migration.

(c) Landfill gas control measures to protect structures and public health and safety shall include one or more of the following:

- (1) Flexible membrane liners,
- (2) Active collection systems,
- (3) Passive collection systems designed to be upgraded to an active system,
- (4) Alarms,
- (5) Ignition source control,
- (6) Utility collars installed within structures and outside in trenches, and
- (7) Ventilation.

(d) To ensure that the landfill gas control system is operating at optimum efficiency to control landfill gas, the operator shall provide for system monitoring and adjustment.

(e) To provide for the safe, efficient operation of the landfill gas control system, the operator shall implement a maintenance program in accordance with the following requirements:

- (1) A site-specific operations and maintenance manual shall be maintained and kept current to reflect any expansion or modifications to the gas control system;
- (2) An operations and maintenance manual shall provide for periodic inspections and servicing of gas control equipment; and
- (3) Operations and maintenance shall be recorded and the records shall be retained by the operator.

(f) Construction Quality Assurance/Quality Control

(1) The operator shall be responsible for providing inspections, as needed, to ensure the integrity of the system.

(2) Prior to construction, the designer shall obtain and review all applicable test reports, shop drawings, and manufacturer's certificates to verify that all equipment used or to be used in the gas control system has been manufactured in accordance with industry standards.

Note:

Authority cited:
Sections 40502 and 45020, [Public Resources Code](#).

Reference:
Section 43021 and 43103, [Public Resources Code](#).

§ 20945. [Reserved by SWRCB]

[Reserved by SWRCB]