

WORKSHOP REPORT
RULE 1205
CONTROL OF DIOXINS EMISSIONS FROM MEDICAL WASTE
INCINERATORS

A workshop notice was mailed to owners and operators of incinerators in San Diego County. Notices were also mailed to all Economic Development Corporations and Chambers of Commerce in San Diego County, the U. S. Environmental Protection Agency (EPA), the California Air Resources Board (ARB), and other interested parties.

The workshop was held on December 18, 1991 and was attended by two people. Written comments were received from the ARB. The comments and District responses are as follows:

WORKSHOP COMMENT:

If a medical waste incinerator is exempt from the rule, would the temperature requirement for the final combustion zone still apply?

DISTRICT RESPONSE:

No. As indicated in Subsection (b)(2) of the rule, any person claiming exemption due to low throughput would only have to provide training for operators of the incinerator and maintain daily records of the waste being incinerated.

ARB COMMENT:

In Section (b), the reference to another portion of the rule is incorrect. Instead of referencing Subsection (c)(7), it should say Subsection (c)(8).

DISTRICT RESPONSE:

The correction has been made. In the revised rule, the correct reference is Subsection (c)(9).

ARB COMMENT:

For clarity in the rule, the District should remove the last sentence in Subsection (c)(1).

DISTRICT RESPONSE:

The District disagrees. The last sentence was included to provide information on how 2, 3, 7, 8 -tetrachlorinated dibenzo-para-dioxins equivalents were determined. Omitting this sentence would not add further clarity to the rule or definition.

ARB COMMENT:

For clarity in the rule, the word "area" in Subsection (c)(3) should be replaced with "volume".

DISTRICT RESPONSE:

Subsection (c)(3) has been revised accordingly.

ARB COMMENT:

For clarity in the rule, the phrase "the amount of time particle" in Subsection (c)(9) should be replaced with "the amount of time a particle...".

DISTRICT RESPONSE:

The correction has been made. In the revised rule, Subsection (c)(9) is now (c)(10).

ARB COMMENT:

The definition of Qc in Subsection (d)(2)(ii) should refer to Subsection (g)(2) which identifies the required measurement method. It is suggested to add the following language to the definition of Qc: "...and measured as required by Subsection (g)(2)."

DISTRICT RESPONSE:

Subsection (g)(2) has been revised accordingly.

ARB COMMENT:

For clarity in the rule, the District should make it clear in Subsection (e)(3)(ii) that the source shall maintain daily records of all maintenance and repair schedules and activities, including any malfunction or failure, for the incinerator and air pollution control equipment.

DISTRICT RESPONSE:

Subsection (e)(3) requires the owner or operator to maintain daily records of process information listed in Subsection (e)(3)(ii) including all maintenance and repair schedules and activities, malfunctions or failures. Subsection (e)(3)(ii) has been revised; "Incinerator or control equipment" has been changed to "incinerator and control equipment".

ARB COMMENT:

In Subsection (g)(2), the District should be aware that Qc measured at the sampling points must be corrected for the temperature and pressure differences that exist between the sampling point and the combustion chamber. Although it may be acceptable to assume constant pressure in some cases, the District may need to use an alternative approach when this assumption cannot be justified or when a measurement cannot be made.

DISTRICT RESPONSE:

Language has been added to Subsection (g)(2) to ensure that Qc is corrected to the temperature and pressure of the combustion chamber and that alternative methods may be used at the discretion of the Air Pollution Control Officer.

ARB COMMENT:

In Subsection (g)(2), the District should consider specifying in the rule that the high resolution mass spectrometry (HRMS) option of ARB Method 428 be used to determine compliance with the regulation, since facilities which comply with the 10 ng/kg standard would emit very low concentrations of dioxins and furans. High resolution mass spectrometry offers better selectivity and lower detection limits when compared to low resolution mass spectrometry (LRMS).

DISTRICT RESPONSE:

The District has reviewed Method 428 and has determined to leave the decision to use HRMS or LRMS to the testing company. However, language has been added to Subsection (g)(2) which states that a test protocol must be submitted and approved by the District prior to testing. This will ensure that the appropriate mass-spectrometry method is used if very low concentrations of dioxins have to be measured.

ARB COMMENT:

In Subsection (h)(4), the District should remove the option to conduct source testing at the maximum firing capacity ($\pm 10\%$) of the incinerator, and just require that testing shall be conducted at the maximum permitted capacity ($\pm 10\%$) contained in the Permit to Operate. This requirement is contained in the Board-approved ATCM.

DISTRICT RESPONSE:

The District agrees that the maximum permitted capacity level is more appropriate than the maximum firing capacity. The rule has been changed to delete the options.

ARB COMMENT:

In Subsection (h)(5), the District should consider incorporating into its rule methods for estimating the amount of waste that is infectious, pathological, hazardous, or radioactive.

The District should consider specifying the method for determining the representativeness of the waste to be used for the compliance test.

DISTRICT RESPONSE:

The District has determined that the type of waste can vary from facility to facility. Methods for estimating the type of waste would be best accomplished on a case-by-case basis. Therefore, methods should not be included in the rule.

Likewise, determining the representativeness of the waste would be best accomplished on a case-by-case basis. During the permitting process, applicants will be required to provide information on the waste incinerated. This information could be used to validate the waste used during source testing.

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Proposed New Rule 1205 is added to Regulation XII to read as follows:

RULE 1205. CONTROL OF DIOXINS EMISSIONS FROM MEDICAL WASTE INCINERATORS

(a) APPLICABILITY

This rule shall apply to any medical waste incinerator.

(b) EXEMPTIONS

(1) The provisions of this rule shall not apply to incinerators which are exclusively crematoria of human or animal remains as defined in Subsection (c)(7) ~~(8)~~ (9) of this rule.

(2) The provisions of this rule shall not apply to existing incinerators which incinerate less than 10 tons per year of medical waste, provided that any. Any person claiming this exemption complies shall comply with Section (f) of this rule and shall maintains records in accordance with Subsections (e)(3), (e)(5) and (e)(6).

(c) DEFINITIONS

For the purpose of this rule the following definitions shall apply:

(1) **"Dioxins"** means dibenzo-p-dioxins and dibenzofurans chlorinated in the 2, 3, 7, and 8 positions and containing 4, 5, 6, or 7 chlorine atoms. Emissions of dioxins are expressed in terms of 2, 3, 7, 8 -tetrachlorinated dibenzo-para-dioxin equivalents (TCDD equivalents) as determined by the California Department of Health Services. TCDD equivalents are based on the relative potency of the fifteen dioxins or furans as compared to 2, 3, 7, 8-TCDD.

(2) **"Existing Incinerator"** means a medical waste incinerator which was installed and operating on or before (*date of adoption*).

(3) **"Final Combustion Zone"** means the area of combustion incinerator volume downstream of both the primary chamber and the location where a temperature of 1800 ± 200° F, (982 ± 93°C) is first obtained. This area volume may include sections of the flue gas duct.

(4) **"Incinerator"** means the same as "medical waste incinerator" defined in Subsection (c)(7).

~~(4)(5)~~ **"Medical Facility"** means any veterinary, medical or dental office, clinic or hospital, any veterinary, medical, or dental instructional or research facility or laboratory, skilled nursing facility, clinical laboratory, surgery center, diagnostic laboratory, or other provider of health care.

~~(5)~~(6) **"Medical Waste"** means waste which is generated at medical facilities as a result of the diagnosis, treatment, or immunization of human beings or animals, in research pertaining thereto, or in the production or testing of biologicals. Medical waste includes, but is not limited to, human or animal specimen cultures, parts, tissues, body fluids, or blood, and sharps, vials, syringes, bandages, bags, or swabs.

~~(6)~~(7) **"Medical Waste Incinerator"** means a furnace or other closed fire chamber that is used to burn medical waste.

~~(7)~~(8) **"New Equipment"** means a medical waste incinerator installed after *(date of adoption)*.

~~(8)~~(9) **"Remains"** means whole human or animal bodies, or parts thereof. Samples of either blood, tissues, organs or body fluids shall not be considered remains if they are enclosed in or adhere to other materials, including but not limited to vials, syringes, bandages, bags, or swabs.

~~(9)~~(10) **"Residence Time"** means the amount of time a particle in the combustion gas spends within a specified volume.

~~(10)~~(11) **"Uncontrolled Emissions"** means the dioxins emissions measured from an incinerator at a location downstream of the final combustion chamber and upstream of the air pollution control equipment.

~~(11)~~(12) **"Waste"** means all discarded putrescible and nonputrescible solid, semisolid, and liquid materials, including but not limited to, garbage, trash, refuse, paper, rubbish, food, ashes, plastics, industrial wastes, demolition and construction wastes, equipment, instruments, utensils, appliances, chemicals, solvents, manure, and human or animal solid, semisolid, or liquid wastes.

(d) **STANDARDS**

(1) No person shall operate a medical waste incinerator unless, at any time:

(i) The uncontrolled emissions have been reduced by 99 % or more, by weight; or

(ii) The emissions of dioxins to the atmosphere have been reduced to 10 nanograms or less per kilogram of waste burned.

(2) No person shall operate a medical waste incinerator unless it meets the following requirements:

(i) The final combustion zone shall be maintained at a minimum temperature of $1800 \pm 200^{\circ}\text{F}$, ($982 \pm 93^{\circ}\text{C}$).

(ii) For the combustion gas, the furnace design shall provide for a residence time in the final combustion zone of at least ~~0.3 seconds~~ 1.0 second at a minimum temperature of $1800 \pm 200^{\circ}\text{F}$, ($982 \pm 93^{\circ}\text{C}$), unless it can be demonstrated to the

satisfaction of, and approved in writing by, the Air Pollution Control Officer that the emissions standards in Subsection (d)(1) of this rule can be obtained at a shorter residence time.

Residence time shall be calculated using the following equation:

$$\text{Residence time} = \frac{V}{Q_c}$$

where:

"V" = the volume of the final combustion zone, expressed in cubic feet and is measured from a location downstream of the primary chamber where the maximum temperature of $1800 \pm 200^\circ \text{F}$, ($982 \pm 93^\circ \text{C}$) has been attained to a location further downstream where the temperature has dropped to no less than 1600°F (871°C). The volume shall not include the burner flame, nor sections in the incinerator subjected to impingement by any burner flame.

"Q_c" = the average combustion gas volumetric flow rate through the incinerator volume, expressed in actual cubic feet per second, and determined as required by Subsection (g)(2).

(iii) The furnace design shall provide for adequate mixing and turbulence of the combustion gas.

(iv) The waste charged to the incinerator, ~~as measured in pounds per hour,~~ shall not exceed the maximum waste firing capacity of the incinerator, or the capacity level as specified by enforceable conditions of a District Permit to Operate whichever is less.

(3) No person shall operate a medical waste incinerator unless such incinerator has been equipped with air pollution control equipment that has been approved in writing by, the Air Pollution Control Officer and which:

(i) Has been installed in accordance with the Authority to Construct; and

(ii) Is operated in a manner that ensures that the flue gas temperature at the outlet of the control equipment does not exceed 300°F (149°C), unless it has been demonstrated to, and approved in writing by the Air Resources Board and the Air Pollution Control Officer that lower emissions can be achieved at a higher outlet temperature; and

(iii) Meets the requirements of Subsection (d)(1).

(4) All post-combustion waste collected from the incinerator, including but not limited to, bottom ash, fly ash and scrubber residuals, shall be handled and stored in a manner that prevents entrainment into the atmosphere.

(5) All waste streams, including but not limited to, wastewater, sludge and slurry, shall be disposed of in accordance with all local, state and federal regulations, including, but not limited to, the City of San Diego Municipal Code, Chapter VI, Article 4, Sections 64.0100 to 64.0711 and the California Code of Regulations, Title 22, Sections 66723 and 66699.

(e) MONITORING AND RECORDKEEPING REQUIREMENTS

(1) The owner or operator of a medical waste incinerator shall install and maintain continuous monitors which, at a minimum, record the following parameters:

(i) The final combustion chamber zone temperature; and

(ii) The emission concentration of carbon monoxide, as measured upstream of the air pollution control equipment, calculated as parts per million (volume) on a dry basis; and

(iii) The opacity of emissions to the atmosphere, or other indicator of particulate matter as approved by the Air Pollution Control Officer.

(2) The owner or operator of a medical waste incinerator shall calibrate all monitoring equipment on a daily basis and shall maintain calibration and maintenance records.

(3) The owner or operator of a medical waste incinerator shall maintain daily records of the following process information, including but not limited to:

(i) The hourly weight charging rates to the incinerator, using calibrated equipment which has been approved by the Air Pollution Control Officer to determine and record the weight of waste charged; and

(ii) All maintenance and repair schedules and activities, of the incinerator and control equipment including any malfunction or failure, ~~of the incinerator or control equipment.~~

(4) The owner or operator of a medical waste incinerator shall install and maintain continuous monitors which record the following operating data for air pollution control equipment, as applicable, including but not limited to:

(i) Flue gas inlet and outlet temperatures;

(ii) Liquid flow rate, liquid supply pressure, and pH; and

(iii) Differential pressure drop of the flue gas across the control equipment.

(5) Any violation, malfunction, upset condition, or breakdown of the incinerator, the air pollution control equipment, or the continuous monitoring equipment shall be reported to the District immediately upon detection.

(6) The owner or operator of a medical waste incinerator shall maintain all records required by this section for a period not less than two years. These records shall be maintained on the premises and made available to the District upon request.

(f) TRAINING REQUIREMENTS

(1) No person shall operate or charge a medical waste incinerator unless such person obtains either a certificate of training in medical waste incineration issued by the American Society of Mechanical Engineers within nine months of the commencement of the training program, or equivalent training as determined by the Air Pollution Control Officer.

(2) The original training certificates shall be maintained at the facility and made available to the District upon request.

(g) TEST METHODS

(1) Measurements of dioxins emissions subject to the requirements of Subsections (d)(1)(i) or (d)(1)(ii) of this rule shall be conducted in accordance with California Air Resources Board Test Method 428.

(2) Measurements of the combustion gas volumetric flow rate subject to Subsection (d)(2)(ii) of this rule shall be conducted in accordance with California Air Resources Board Test Method 2.

The combustion gas volumetric flow rate shall be corrected to the maximum combustion chamber temperature (T_c) and the chamber pressure (P_c).

Alternative methods for determining the combustion gas volumetric flow rate may be used provided the alternative method has been submitted to, and approved in writing by, the Air Pollution Control Officer prior to testing.

(3) A source test protocol shall be submitted to, and approved in writing by, the Air Pollution Control Officer prior to testing.

(h) SOURCE TEST REQUIREMENTS

(1) For the purposes of determining compliance with Subsections (d)(1) or (d)(2)(ii) of this rule, the owner or operator of a medical waste incinerator shall conduct a minimum of two annual source tests in accordance with a source test protocol approved by the Air Pollution Control Officer. Following the initial compliance tests, annual source tests shall be conducted until at least two consecutive annual tests demonstrate compliance. Thereafter, the frequency of future source tests shall be at the discretion of the Air Pollution Control Officer.

(2) For purposes of determining compliance with Subsection (d)(1)(i) of this rule, source testing shall be conducted simultaneously at the emissions outlet to the atmosphere and at a location in the flue prior to the control equipment but downstream of the final combustion chamber.

(3) For purposes of determining compliance with Subsection (d)(1)(ii) of this rule, source testing shall be conducted at the emissions outlet to the atmosphere.

(4) Source testing shall be conducted ~~at the maximum waste firing capacity ($\pm 10\%$) of the incinerator, or~~ at the maximum permitted capacity level ($\pm 10\%$) as specified by enforceable conditions of a Permit to Operate.

(5) The waste charged during the source test shall be representative of the waste routinely incinerated at the facility. The feed rate and composition of the waste charged during the source test shall be provided with the source test results, including estimated percent moisture content, and estimated infectious, pathological, hazardous, or radioactive waste content.

(7) A copy of all source test results shall be provided concurrently to the District and to the California Air Resources Board within 45 days after the source test.

(i) **COMPLIANCE SCHEDULE**

(1) No later than *(90 days after date of adoption)*, the owner or operator of an existing medical waste incinerator shall submit to the Air Pollution Control Officer an application for an Authority to Construct the air pollution control and monitoring equipment and any incinerator modifications necessary to meet the requirements of Section (d) of this rule.

(2) No later than *(15 months after date of adoption)*, the owner or operator of an existing medical waste incinerator shall be in compliance with all provisions of this rule.

(3) No later than *(90 days after date of adoption)*, the owner or operator of an existing medical waste incinerator who intends to permanently cease operation of the incinerator shall notify the Air Pollution Control Officer of the shutdown date. The shutdown date shall be no later than *(180 days after date of adoption)*.

(4) Any person installing new equipment shall comply with the applicable provisions of Section (d) upon initial installation and startup.