

REGULATION 9
INORGANIC GASEOUS POLLUTANTS
RULE 13
NITROGEN OXIDES, PARTICULATE MATTER, AND TOXIC AIR
CONTAMINANTS FROM PORTLAND CEMENT MANUFACTURING

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CONTAMINANTS FROM PORTLAND CEMENT MANUFACTURING

(Adopted September 17, 2012)

9-13-100 GENERAL

9-13-101 Description: This rule limits the emissions of nitrogen oxides, particulate matter, and toxic air contaminants from the manufacture of Portland cement.

9-13-200 DEFINITIONS

9-13-201 24-Hour Rolling Average: The arithmetic mean of the emissions as prescribed in Section 9-13-301 of the most recent 24 hours of operation of the kiln. Each hour initiates a new rolling average period.

9-13-202 30-Operating Day Rolling Average: The arithmetic mean of the emissions as prescribed in Section 9-13-301 of the most recent 30 operating days. Each operating day initiates a new rolling average period.

9-13-203 Adequately Wetted: Sufficiently moistened with water to minimize the release of particulate matter into the ambient air as determined by the provisions of Section 9-13-611.

9-13-204 Clinker: The product of feedstock sintered in a kiln which is then ground and mixed with additives to make cement.

9-13-205 Clinker Cooler: Equipment into which clinker leaving the kiln is placed to be cooled by air supplied by a forced draft or natural draft supply system.

9-13-206 Dioxins and Furans (D/F): Tetra-, penta-, hexa-, hepta-, and octa-chlorinated dibenzodioxins and furans.

9-13-207 HEPA Filter: High Efficiency Particulate Air filter used to remove particles less than 1 micron in diameter operating at removal efficiencies of 99.9 percent or greater.

9-13-208 Kiln: Any device including associated preheater and precalciner devices that produce clinker by heating limestone and other raw materials for subsequent production of Portland cement.

9-13-209 Miscellaneous Operations: Any activity performed at the facility that could generate emissions of fugitive dust. Examples of miscellaneous operations include: material conveyance and transporting, vehicular traffic, shoveling and sweeping, and material storage.

9-13-210 Nitrogen Oxides (NOx) Emissions: The sum of nitric oxide (NO) and nitrogen dioxide (NO₂) in the flue gas, collectively expressed as nitrogen dioxide.

9-13-211 Operating Day: A calendar day during which Portland cement is manufactured by the kiln. An operating day includes all valid data obtained in any daily 24-hour period during which the kiln operates and excludes any measurements made during the daily 24-hour period when the kiln was not operating or was in startup or shutdown.

9-13-212 Particulate Matter: Any material that is emitted as liquid or solid particles or gaseous material which becomes filterable at the testing temperatures specified in the referenced test method.

9-13-213 Portland Cement Manufacturing Facility: Any facility that produces Portland cement or associated products, as defined in the Standard Industrial Classification Manual as Industry Number 3241, Portland Cement Manufacturing.

9-13-214 Shutdown: The period of time between when kiln raw material feed and fuel to the kiln begin to be decreased to reduce the kiln operating temperature until both feed

and fuel are no longer fed into the kiln and it has ceased operation. A shutdown period shall not last more than 24 hours.

- 9-13-215 Startup:** The period of time between when fuel is first introduced into the kiln to heat it and when the kiln operating temperature reaches normal operating limits and raw material feed begins. A startup period shall not last longer than 36 hours.
- 9-13-216 TEQ:** The international method of expressing toxicity equivalents for dioxins and furans as defined in U.S. EPA, Interim Procedures for Estimating Risks Associated with Exposures to Mixtures of Chlorinated Dibenzo-p-dioxins and -dibenzofurans (CDDs and CDFs) and 1989 Update, March 1989.
- 9-13-217 Total Hydrocarbon (THC):** For the purposes of this rule, total hydrocarbon emissions measured as propane, that also serve as a surrogate for the emissions of organic HAP compounds, as measured in accordance with Section 9-13-606.
- 9-13-218 Total Organic HAP:** For the purposes of this rule, the sum of the concentrations of compounds of formaldehyde, benzene, toluene, styrene, m-xylene, p-xylene, o-xylene, acetaldehyde, and naphthalene as measured in accordance with Section 9-13-607.
- 9-13-219 Track-Out:** Any bulk material that adheres to or agglomerates on the exterior surfaces of motor vehicles, haul trucks, and/or mobile equipment, including tires and that has fallen or been deposited onto a paved public roadway.
- 9-13-220 182-Operating Day Rolling Average:** The arithmetic mean of the emissions as prescribed in sections 9-13-301 of the most recent 182 operating days. Each operating day initiates a new rolling average period.

9-13-300 STANDARDS

- 9-13-301 Emission Limits:** Effective September 9, 2013, no person shall operate a Portland cement manufacturing facility unless the following emission limits are met:
- 301.1 The 30-operating day rolling average of nitrogen oxides (NO_x) emissions from the kiln shall not exceed 2.3 pounds per ton of clinker produced;
 - 301.2 Particulate matter (PM) emissions from the kiln shall not exceed 0.04 pounds per ton of clinker produced, based on a three run test average;
 - 301.3 PM emissions from the clinker cooler shall not exceed 0.04 pounds per ton of clinker produced, based on a three run test average;
 - 301.4 The ~~24-hour~~182-operating day rolling average of ammonia (NH₃) emissions from the kiln shall not exceed ~~baseline emission levels by more than 10~~270 ppmv, dry at 7 percent oxygen;
 - 301.5 The 24-hour rolling average dioxins and furans (D/F) emissions from the kiln shall not exceed 0.2 ng-TEQ/dscm at 7 percent oxygen;
 - 301.6 The 30-operating day rolling average of mercury emissions from the kiln shall not exceed 55 pounds per million tons of clinker produced;
 - 301.7 The 30-operating day rolling average of total hydrocarbon (THC) emissions from the kiln shall not exceed 24 ppmv, dry at 7 percent oxygen; or as an alternative, provided the provisions of Section 9-13-403 have been completed, the 30-operating day rolling average of total organic HAP emissions from the kiln shall not exceed 12 ppmv, dry at 7 percent oxygen;
 - 301.8 The 30-operating day rolling average hydrogen chloride (HCl) emissions from the kiln shall not exceed 3 ppmv, dry at 7 percent oxygen.
- 9-13-302 Opacity:** Effective September 9, 2013, no person shall operate a Portland cement manufacturing facility with emissions to atmosphere from any miscellaneous operation or emission point other than from the kiln or clinker cooler that are equal to or greater than ten percent opacity for more than three minutes aggregated in any one-hour period, determined in accordance with Section 9-13-609, or half as dark in shade as that designated as Number 1 on the Ringelmann Chart, as published by the United States Bureau of Mines. Emissions to the atmosphere from the kiln and clinker cooler are subject to the opacity limit in Regulation 6, Rule 1.
- 9-13-303 Stack Requirements:** Effective September 9, 2013, no person shall operate a Portland cement manufacturing facility unless emissions from the kiln are monitored
- Bay Area Air Quality Management District September 19, 2012

as per Section 9-13-501 and enter the atmosphere from a point or points that, at maximum potential to emit, or maximum permitted emission level, when combined with other facility emissions, have been demonstrated not to exceed the notification threshold established under Air Toxics "Hot Spots" Information and Assessment Act requirements as codified in California Health and Safety Code Section 44300 et al. and the Districts' Air Toxics Hot Spots program.

9-13-304 Fugitive Dust Mitigation Control Measures: Any person operating a Portland cement manufacturing facility shall at a minimum implement the following measures to mitigate emissions of fugitive dust:

- 304.1 Accessed disturbed open areas and unpaved roads shall be watered as needed to maintain adequate wetness.
- 304.2 In areas that have not had vehicular traffic for more than 7 days, the exposed soils shall be stabilized by the use of water, aggregate, or non-toxic soil stabilizers. Vehicular access to these designated areas shall be limited through the use of signage and vehicular access barricades.
- 304.3 Ground covering on disturbed areas shall be reestablished as soon as reasonably possible through the use of aggregates, berms, or permanent blockage in combination with hydro-seeding or seeding and watering.
- 304.4 An operational water truck shall be onsite at all times to prevent fugitive dust emissions. Water shall be applied as needed to comply with Section 9-13-302 for all mining, aggregate, and cement plant operations. Application of water may be curtailed during wet weather. All water truck operations shall be recorded in a District approved log and include date, times, locations and activities.
- 304.5 Material Storage Piles: Fugitive dust emissions from material storage piles shall be controlled by one or more of the following methods:
 - 5.1 Fine, dry material not amenable to water applied dust suppression shall be covered and have wind breaks installed;
 - 5.2 Water and/or soil stabilizers shall be employed to reduce windblown dust. Water may be supplied by water truck or water spray equipment; or
 - 5.3 In areas surrounding material storage piles, soils shall be stabilized by the use of water, aggregate, or non-toxic soil stabilizers.
- 304.6 Material Transfer Processes: Fugitive dust emissions resulting from all transfer processes, including but not limited to the transfer of material to or from stockpiles, belt conveyors, front end loading equipment, vehicular transport, and bin transfer which involves a free fall of mined, purchased, or manufactured materials, shall be controlled by one or more of the following mitigation methods:
 - 6.1 Drop heights shall be minimized for all front end loaders transferring materials for mobile transport (quarry truck, transfer truck, bulk truck);
 - 6.2 Incorporation of wind breaks, enclosures, and area covers;
 - 6.3 Installation of temporary or permanent water spray systems, or water truck incorporation to increase material moisture content and suppress fugitive dust emissions from infrequent material transfer operations; or
 - 6.4 HEPA filter vacuuming of any spilled cement powder during cement bulk loading operations into mobile equipment.
- 304.7 Track-out Prevention and Control: The following mitigation methods shall be employed to prevent fugitive dust emissions from track-out:
 - 7.1 All vehicles and equipment owned or operated by the Portland cement manufacturing facility shall be washed prior to exiting the facility onto public paved streets.
 - 7.2 All other vehicles shall be washed prior to exit onto public paved streets if they have traveled on unpaved roads on the facility.
 - 7.3 A street sweeper shall be operated at least once a day to remove visible track-out from the paved roadway between the plant entrance and the facility boundary.

- 304.8 Vehicle Traffic Speed: The speed of all vehicles and mobile equipment traveling within the facility shall be limited to 15 miles per hour (mph) or less. The operator of the facility shall provide training, signage, and maintain video and photographic monitoring, and speed sensors to ensure compliance with the posted speed limit. The operator of the facility shall maintain records demonstrating compliance with this provision through enforcement of the following actions in progressive order:
- 8.1 Customers or visitors found to be travelling in excess of the posted speed limit; 1) issue verbal warning; 2) facility access to be limited; and 3) facility access to be denied,
 - 8.2 Employees found to be travelling in excess of the posted speed limit: 1) issue verbal warning; and 2) progressive discipline up to and including termination.
 - 8.3 Contractors and subcontractors deemed to be travelling in excess of the posted speed limit: 1) issue verbal warning; and 2) site removal and future facility access denied.
- 304.9 Quarries: All quarried and graded materials shall be kept adequately wet to minimize airborne dust. Blasting shall not occur if hourly averaged wind speeds are 25 mph or greater.
- 304.10 Material Handling Equipment: At the start of each shift or material handling equipment start-up, the operators shall assess the operational status of the water spray abatement equipment or confirm that the materials are sufficiently wet as to not require water spray abatement and record these determinations in a district approved log.
- 304.11 Housekeeping and Material Cleanup: All housekeeping activities shall be performed so as to minimize fugitive dust emissions.
- 304.12 Training: Employees, contracted and subcontracted personnel shall be initially and at least annually thereafter be trained on techniques and best management practices to avoid fugitive dust emissions. Training shall include all relevant procedures identified in facility plans including but not limited to the Fugitive Dust Control Plan, and Operation and Maintenance Plan, and Preventative Maintenance Program for Dust Control. Records shall be maintained to demonstrate compliance with this provision.

9-13-400 ADMINISTRATIVE REQUIREMENTS

9-13-401 Initial and Annual Demonstration of Compliance: No later than 30 operating days after September 9, 2013, any person manufacturing Portland cement shall conduct an initial demonstration of compliance with Section 9-13-301 by conducting a source test according to the methods referenced in Sections 9-13-601 through 608. An annual demonstration of compliance with Sections 9-13-301.1 through 301.4, 301.6 and 301.8 shall be conducted at least once each calendar year following the initial test, and not more than 15 months after the most recently conducted annual demonstration of compliance. A demonstration of compliance with Sections 9-13-301.5 and 301.7 shall be conducted at least once every 30 months.

~~**9-13-402 Baseline Ammonia Emission Level Determination:** No later than 90 operating days after rule adoption, any person manufacturing Portland cement shall begin monitoring ammonia emissions from the kiln for the purpose of establishing a baseline emission level for kiln operations prior to the installation and subsequent operation of NOx control equipment. Monitoring shall be conducted according to Section 9-13-501, and determination of the baseline ammonia emission level shall be calculated as specified in regulation 9-13-610.~~

9-13-403 Total Organic HAP Emissions Test: No later than 30 operating days after September 9, 2013, any person manufacturing Portland cement seeking to satisfy the alternative emission limit in Section 9-13-301.7, shall conduct a source test to determine emissions of total organic HAP according to the methods referenced in Section 9-13-607. Each source test shall consist of three separate runs conducted

for at least 1 hour. Concurrent with the source test, THC emissions shall be determined by operating the parametric monitor specified in Section 9-13-501.2. The duration of the source test shall be 3 hours and the average THC concentration during the 3-hour test shall be calculated. A correlation between Total Organic HAP and THC concentrations shall be determined based on these results. This correlation procedure shall be conducted thereafter at least once every 30 months.

9-13-404 Health Risk Assessment: Prior to construction or modification to emission points from the kiln or clinker cooler, the operator of a Portland cement manufacturing facility shall complete and submit to the District a health risk assessment conducted according to Health Risk Assessment Guidelines adopted by Cal/EPA's Office of Environmental Health Hazard Assessment (OEHHA) for use in the Air Toxics Hot Spots Program. District review of the HRA shall be conducted concurrent to review of application of authority to construct and permit to operate submitted for emission point modifications.

9-13-405 Dioxins and Furans Emissions Test: No later than 30 operating days after September 9, 2013, any person manufacturing Portland cement shall conduct a source test to determine emissions of dioxins and furans (D/F) according to the methods referenced in Section 9-13-604. Each source test shall consist of three separate runs conducted under representative conditions. Concurrent with the source tests, the temperature of the kiln exhaust gas at the inlet to the PM control device shall be determined by operating the parametric monitor specified in Section 9-13-501.2. The duration of each run shall be at least 3 hours and the average temperature during the 3-hour run shall be calculated. A correlation between D/F concentrations and temperature shall be determined based on these results. This correlation procedure shall be conducted thereafter at least once every 30 months.

9-13-500 MONITORING AND RECORDS

9-13-501 Emissions Monitoring: Any person who operates a Portland cement manufacturing facility subject to Section 9-13-301 shall provide, properly install, maintain in good working order, and operate the following emission monitoring equipment:

501.1 Continuous Emissions Monitoring: A continuous emission monitoring system (CEMS) for each emission point from the kiln, to demonstrate compliance with the provisions of this rule by measuring nitrogen oxides (NO_x), and either oxygen (O₂) or carbon dioxide (CO₂). The CEMS shall meet the requirements of the District Manual of Procedures, Volume V, Continuous Emission Monitoring, Policy and Procedures. Each CEMS shall complete a minimum of one cycle of operation (sampling, analyzing, and data recording) for each successive fifteen (15) minute period.

501.2 Parametric Monitoring: Suitable instruments to monitor continuously for each emission point from the kiln, to demonstrate compliance with the provisions of this rule by measuring ammonia (NH₃), temperature for dioxins and furans (D/F), mercury (Hg), total hydrocarbon (THC), hydrochloric acid (HCl), operational integrity of PM control device, and volumetric flow. The parametric monitors shall meet the requirements specified in the most recent revision to 40 CFR, Part 60 and Appendices.

9-13-502 Production Monitoring: Any person who operates a Portland cement manufacturing facility subject to Section 9-13-301 shall determine hourly clinker production by one of the following two methods:

502.1 Provide, properly install, maintain in good working order, and operate permanent weigh scale system to measure and record weight rates of the amount of clinker produced in tons of mass per hour. The system of measuring hourly clinker production shall be maintained within 5% accuracy, and the accuracy of the system shall be verified and recorded on a weekly basis. Hourly clinker production rates shall be totaled every 24 hours to provide a daily production rate.

502.2 Provide, properly install, maintain in good working order, and operate permanent weigh scale system to measure and record weight rates of the amount of feed into the kiln in tons of mass per hour. The system of measuring hourly feed into the kiln shall be maintained within 5% accuracy, and the accuracy of the system shall be verified and recorded on a weekly basis. Calculate the hourly clinker production rate using feed to clinker ratio based on reconciled clinker production determined for accounting purposes and recorded feed rates. This ratio shall be updated monthly. If the ratio is changed at monthly reconciliation, the new ratio shall be used to determine clinker production rates going forward but shall not change previously estimated production rates retroactively. Hourly clinker production rates shall be totaled every 24 hours to provide a daily production rate.

9-13-503 Records: Any person subject to the requirements of this rule shall keep records of the following:

- 503.1 The results of any source testing conducted to determine compliance with Section 9-13-301 as specified in Section 9-13-401.
- 503.2 The continuous emission monitoring system (CEMS) measurements for NO_x, and diluents O₂ or carbon dioxide in ppmv; and hourly (lbs/hour) and daily (lbs/day) NO_x emissions from the kiln.
- 503.3 The parametric monitoring measurements for NH₃, D/F, Hg, HCl, and THC; and hourly (lbs/hour) and daily (lbs/day) NH₃, Hg, HCl, and THC emissions from the kiln.
- 503.4 The clinker production rate in tons per day for each day of operation of the kiln.
- 503.5 The calculated NO_x, PM, and Hg emission rates from the kiln in pounds per ton of clinker produced for each day of operation of the kiln.
- 503.6 The calculated PM emission rate from the clinker cooler in pounds per ton of clinker produced for each day of operation of the kiln.
- 503.7 The daily average NH₃, HCl, and THC concentration emitted in ppmv for each day of operation of the kiln.
- 503.8 The calculated Total Organic HAP concentration emitted in ppmv for each day of operation of the kiln.
- 503.9 The calculated daily average D/F concentration emitted in ng-TEQ/dscm for each day of operation of the kiln.
- 503.10 The date, time, and duration of any startup, shutdown or malfunction in the operation of any unit, emissions control equipment or emission monitoring equipment.
- 503.11 The results of performance testing, evaluations, calibrations, checks, adjustments, and maintenance of all CEMS and parametric monitors required by this rule.

Such records shall be retained for a minimum of 60 months from date of entry and be made available to District staff upon request.

9-13-504 Reporting Requirements: A person subject to the requirements of Sections 9-13-301 shall meet the following reporting requirements:

- 504.1 Report to the APCO any exceedance of Section 9-13-301 in accordance with the requirements of Regulation 1-522 for continuous emission monitoring systems (CEMS), and Regulation 1-523 for parametric monitors.
- 504.2 Submit a written report for each calendar month to the APCO. The report shall be due on the 30th day following the end of the calendar month and shall include:
 - 2.1 A summary of the data obtained from the CEMS or equivalent parametric monitoring system; and
 - 2.2 The date, time, duration, and magnitude of emissions in excess of the appropriate standards; the nature and cause of the excess (if known); the corrective actions taken; and the preventive measure adopted.

9-13-600 MANUAL OF PROCEDURES

- 9-13-601 Determination of Nitrogen Oxides:** Compliance with the emission limit of Section 9-13-301.1 shall be determined by the source tests specified in Section 9-13-401 using ST-13A (nitrogen oxides), ST-14 (oxygen), and ST-5 (carbon dioxide), and by the continuous emission monitors that have been installed pursuant to Section 9-13-501 and meet the requirements of Volume V of the District Manual of Procedures and the federal requirements specified in the most recent revision of the Code of Federal Regulations, Title 40 (40 CFR), Parts 60, 63 and Appendices.
- 9-13-602 Determination of Particulate Matter:** Compliance with the limits set forth in Section 9-13-301.2, and 301.3 shall be determined by the source tests specified in Section 9-13-401 using United States Environmental Protection Agency (EPA), Method 5 – Determination of Particulate Matter from Stationary Sources and by the parametric monitors that have been installed pursuant to Section 9-13-501 and meet either the requirements of EPA Fabric Filter Bag Leak Detection Guidance (1997) or the requirements of EPA performance specification 11 for PM CEMS, and the federal requirements specified in the most recent revision to 40 CFR, Parts 60, 63 and Appendices.
- 9-13-603 Determination of Ammonia:** Compliance with the ammonia emission limit of Section 9-13-301.4 shall be determined by the source tests specified in Section 9-13-401 using the methods set forth in District Manual of Procedures, Volume IV, ST-1B and EPA Method 350.3, and by the parametric monitors that have been installed pursuant to Section 9-13-501 and meet the requirements of EPA Preliminary Performance Specification PPS-001 for Ammonia CEMS.
- 9-13-604 Determination of Dioxins and Furans:** Compliance with the D/F emission limit of Section 9-13-301.5 shall be determined by the source tests specified in Section 9-13-401 using the methods set forth in EPA Method 23 and the federal requirements specified in the most recent revision to 40 CFR, Parts 60, 63 and Appendices.
- 9-13-605 Determination of Mercury:** Compliance with the mercury emission limit of Section 9-13-301.6 shall be determined by the source tests specified in Section 9-13-401 using the methods set forth in District Manual of Procedures, Volume IV, ST-10, and by the parametric monitors that have been installed pursuant to Section 9-13-501 and meet the requirements EPA Performance Specifications 12A, or 12b and the federal requirements specified in the most recent revision to 40 CFR, Parts 60, 63 and Appendices.
- 9-13-606 Determination of Total Hydrocarbon:** The THC parametric monitors that have been installed pursuant to Section 9-13-501 shall meet the requirements of EPA Performance Specification 8A and the federal requirements specified in the most recent revision to 40 CFR, Parts 60, 63 and Appendices.
- 9-13-607 Determination of Total Organic HAP:** Compliance with the Total Organic HAP emission limits of Section 9-13-301.7 shall be determined by the source tests specified in Section 9-13-403 using the methods set forth in EPA method 320 or ASTM D6348-03 and the federal requirements specified in the most recent revision to 40 CFR, Parts 60, 63 and Appendices.
- 9-13-608 Determination of Hydrochloric Acid:** Compliance with the hydrochloric acid emission limit of Section 9-13-301.8 shall be determined by the source tests specified in Section 9-13-401 using the methods set forth in EPA Method 320, 321 and by the parametric monitors that have been installed pursuant to Section 9-13-501 and meet the requirements of EPA Performance Specification 15 and the federal requirements specified in the most recent revision to 40 CFR, Parts 60, 63 and Appendices.
- 9-13-609 Determination of Visible Emissions:** Visible emissions shall be determined by Manual of Procedures, Volume 1 – Enforcement Procedures, Part 1: Evaluation of Visible Emissions.
- ~~**9-13-610 Baseline Ammonia Emission Level Calculation:** The following methodology shall be used to calculate baseline ammonia emissions in order to determine compliance with Section 9-13-301.4:~~

~~610.1 The baseline period consists of the period immediately preceding the initial operation of control equipment installed to comply with Section 9-13-301.1. The baseline period shall not be less than 6 months in duration. The owner or operator of the Portland cement manufacturing facility shall have sufficient records of the kiln's operation to substantiate the emission rate during the baseline period.~~

~~610.2 Baseline emission level, expressed in ppmv, dry at 7 percent oxygen, is the median of the 6 monthly average values of the ammonia (NH₃) emissions from the kiln.~~

9-13-611 Determination of Adequately Wetted: A sample of at least one quart in volume shall be taken from the top three inches from the surface of unpaved road, bare area, or from the surface of a stockpile. The sample shall be poured out from a height of four feet onto a clean hard surface. The material shall be considered to be adequately wetted if there is no observable dust emitted when the material is dropped.