Texas Chapter 117 - Control of Air Pollution From Nitrogen Compounds

SUBCHAPTER E: MULTI-REGION COMBUSTION CONTROL

DIVISION 2: CEMENT KILNS
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Outline:

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SUBCHAPTER E: MULTI-REGION COMBUSTION CONTROL
DIVISION 2: CEMENT KILNS
§§117.3100, 117.3101, 117.3103, 117.3110, 117.3120, 117.3123, 117.3140, 117.3142, 117.3145

STATUTORY AUTHORITY

The new sections are adopted under Texas Water Code, §5.102, concerning General Powers, §5.103, concerning Rules, and §5.105, concerning General Policy, which authorize the commission to adopt rules necessary to carry out its powers and duties under the Texas Water Code. In addition, the sections are adopted under Texas Health and Safety Code, §382.002, concerning Policy and Purpose, which states the policy and purpose of the State of Texas and the Texas Clean Air Act; §382.011, concerning General Powers and Duties, which provides the commission with the authority to establish the level of quality to be maintained in the state's air and the authority to control the quality of the state's air; §382.012, concerning State Air Control Plan, which requires the commission to develop plans for protection of the state's air; §382.014, concerning Emission Inventory, which authorizes the commission to require submission information relating to emissions of air contaminants; §382.016, concerning Monitoring Requirements; Examination of Records, which authorizes the commission to prescribe requirements for owners or operators of sources to make and maintain records of emissions measurements; §382.017, concerning Rules, which provides the commission the authority to adopt rules consistent with the policy and purposes of the Texas Clean Air Act; §382.021, concerning Sampling Methods and Procedures, which authorizes the commission to prescribe the sampling methods and procedures; and §382.051(d), concerning Permitting Authority of Commission Rules, which authorizes the commission to adopt rules as necessary to comply with changes in federal law or regulations applicable to permits under Chapter 382. In addition, the new sections are adopted under federal mandates contained in 42 United States Code, §§7401 *et seq.*, which require states to adopt pollution control measures in order to reach specific air quality standards in particular areas of the state.

The adopted sections implement Texas Health and Safety Code, §§382.002, 382.011, 382.012, 382.014, 382.016, 382.017, 382.021, and 382.051(d).

§117.3100. Applicability.

This division (relating to Cement Kilns) applies to each portland cement kiln in Bexar, Comal, Ellis, Hays, and McLennan Counties.

§117.3101. Cement Kiln Definitions.

Unless specifically defined in the Texas Clean Air Act (TCAA) or in the rules of the commission, the terms used by the commission have the meanings commonly used in the field of air pollution control. In addition to the terms that are defined by the TCAA, the following terms, when used in this division (relating to Cement Kilns), have the following meanings, unless the context clearly indicates otherwise. Additional definitions for terms used in this division are found in §§3.2, 101.1, and 117.10 of this title (relating to Definitions).

(1) **Clinker**--The product of a portland cement kiln from which finished cement is manufactured by milling and grinding.

(2) **Indirect-firing system**--A system that reduces the amount of primary air used in a cement kiln by:

(A) separating the powdered fuel from the air stream that carries the fuel from the drying/milling equipment;

(B) storing the fuel briefly; and

(C) using an independent, significantly smaller stream of hot primary air to blow the fuel to the burner.

(3) **Long dry kiln**--A kiln that employs no preheating of the dry feed. The inlet feed to the kiln is dry.

(4) **Long wet kiln**--A kiln that employs no preheating of the dry feed. The inlet feed to the kiln is a slurry.

(5) **Low-NOx burner**--Either of the following:

(A) for long wet kilns, combustion equipment designed to reduce flame turbulence, delay fuel/air mixing, and establish fuel-rich zones for initial combustion; or

(B) a type of cement kiln burner that results in decreasing nitrogen oxides emissions and that has an indirect-firing system and a series of channels or orifices that:

(i) allow for the adjustment of the volume, velocity, pressure, and direction of the air carrying the fuel (known as primary air) and the combustion air (known as secondary air) into the kiln; and

(ii) impart high momentum and turbulence to the fuel stream to facilitate mixing of the fuel and secondary air.

(6) **Low-NOx precalciner**--A process in which a portion of the fuel is injected near the raw material feed end of a preheater or precalciner kiln, resulting in a reducing atmosphere in the preheater or precalciner.

(7) **Mid-kiln firing**--Secondary combustion in long dry or long wet kilns by injecting solid fuel at (or to) an intermediate point in the kiln using a specially-designed feed injection mechanism for the purpose of decreasing nitrogen oxides emissions through:

(A) burning part of the fuel at a lower temperature; and

(B) reducing conditions at the solid fuel injection point that may destroy some of the nitrogen oxides formed upstream in the kiln burning zone.

(8) **Portland cement**--A hydraulic cement produced by pulverizing clinker consisting essentially of hydraulic calcium silicates, usually containing one or more of the forms of calcium sulfate as an interground addition.

(9) **Portland cement kiln**--A system, including any solid, gaseous, or liquid fuel combustion equipment, used to calcine and fuse raw materials, including limestone and clay, to produce portland cement clinker.

(10) **Precalciner kiln**--A kiln where the feed to the kiln system is preheated in cyclone chambers and utilizes a second burner to calcine material in a separate vessel attached to the preheater before the final fusion in a kiln that forms clinker.

(11) **Preheater kiln**--A kiln where the feed to the kiln system is preheated in cyclone chambers before the final fusion in a kiln that forms clinker.

(12) **Secondary combustion**--A system that employs a second combustion point in addition to the primary flame. This definition includes mid-kiln firing in long dry and long wet kilns, and also additional combustion at the raw material feed end of the kiln in preheater-precalciner kilns.

§117.3103. Exemptions.

(a) Portland cement kilns exempted from the provisions of this division (relating to Cement Kilns), include any portland cement kiln placed into service on or after December 31, 1999, except as specified in §§117.3110, 117.3120, and 117.3123 of this title (relating to Emission Specifications; Source Cap; and Dallas-Fort Worth Eight-Hour Ozone Attainment Demonstration Control Requirements).

(b) Any account in Ellis County with no portland cement kilns in operation prior to January 1, 2001, is exempt from §117.3123 of this title.

(c) After the compliance date specified in §117.9320(c) of this title (relating to Compliance Schedule for Cement Kilns), portland cement kilns that are subject to §117.3123 of this title are exempt from §117.3110 and §117.3120 of this title between March 1 and October 31 of each calendar year.

§117.3110. Emission Specifications.

(a) In accordance with the compliance schedule in §117.9320 of this title (relating to Compliance Schedule for Cement Kilns), the owner or operator of each portland cement kiln shall ensure that nitrogen oxides (NO_x) emissions do not exceed the following rates on a 30-day rolling average. For the purposes of this section, the 30-day rolling average is calculated as the total of all the hourly emissions data (in pounds) that fuel was combusted in a cement kiln in the preceding 30 consecutive days, divided by the total number of tons of clinker produced in that kiln during the same 30-day period:

(1) for each long wet kiln:

(A) in Bexar, Comal, Hays, and McLennan Counties, 6.0 pounds per ton (lb/ton) of clinker produced; and

(B) in Ellis County, 4.0 lb/ton of clinker produced;

(2) for each long dry kiln, 5.1 lb/ton of clinker produced;

(3) for each preheater kiln, 3.8 lb/ton of clinker produced; and

(4) for each preheater-precalciner or precalciner kiln, 2.8 lb/ton of clinker produced.

(b) If there are multiple cement kilns at the same account, the owner or operator may choose to comply with the emission specifications of subsection (a) of this section on the basis of a weighted average for the cement kilns at the account that are subject to the same specification. Each owner or operator choosing this option shall submit written notification of this choice to the executive director, the appropriate regional office, and any local air pollution control program with jurisdiction before the appropriate compliance date in §117.9320 of this title.

(c) Each long wet or long dry kiln for which the following controls are installed and operated during kiln operation is not required to meet the NO_x emission specifications of subsection (a) of this section, provided that each owner or operator choosing this option submits written notification of this

choice to the executive director, the appropriate regional office, and any local air pollution control program with jurisdiction before the appropriate compliance date in §117.9320 of this title:

(1) a low-NOx burner and either:

(A) mid-kiln firing; or

(B) some other form of secondary combustion achieving equivalent levels of NOx reductions; or alternatively;

(2) other additions or changes to the kiln system achieving at least a 30% reduction in NOx emissions, provided the additions or changes are approved by the executive director with concurrence from the United States Environmental Protection Agency.

(d) Each preheater or precalciner kiln for which either a low-NOx burner or a low-NOx precalciner is installed and operated during kiln operation is not required to meet the NOx emission specifications of subsection (a) of this section. Each owner or operator choosing this option shall submit written notification of this choice to the executive director, the appropriate regional office, and any local air pollution control program with jurisdiction before the appropriate compliance date in §117.9320 of this title.

(e) An owner or operator may use §117.9800 of this title (relating to Use of Emission Credits for Compliance) to meet the NOx emission control requirements of this section, in whole or in part.

§117.3120. Source Cap.

(a) As an alternative to complying with the requirements of §117.3110 of this title (relating to Emission Specifications) in Bexar, Comal, Ellis, Hays, and McLennan Counties, an owner or operator may reduce total nitrogen oxides (NOx) emissions (in pounds per day (ppd)) from all cement kilns at the account (including any cement kilns placed into service on or after December 31, 1999) to at least 30% less than the total NOx emissions (in ppd) from all cement kilns in the account's 1996 emissions inventory (EI), on a 90-day rolling average basis. For the purposes of this section, the 90-day rolling

average is calculated as the total of all the hourly emissions data for the preceding 90 days. For the calendar year that includes the appropriate compliance date in §117.9320 of this title (relating to Compliance Schedule for Cement Kilns), only hourly emissions data on or after that compliance date is included, such that the first 90-day period ends 90 days after the appropriate compliance date in §117.9320 of this title. A 90-day rolling average emission cap must be calculated using the following equation.

Figure: 30 TAC §117.3120(a)

$$Cap = 0.7\sum_{i=1}^{N} R_i$$

Where:

Cap	=	90-day rolling average NOx emission cap, in ppd;
i	=	each cement kiln at a single account;
N	=	the total number of cement kilns at the account; and
R_i	=	the kiln's ozone season daily NOx emission rate (in ppd) reported in the account's 1996 EI.

(b) To qualify for the source cap option available under this section, the owner or operator shall submit an initial control plan to the executive director, the appropriate regional office, and any local air pollution control program with jurisdiction that demonstrates that the overall reduction of NOx emissions from all cement kilns at the account will be at least 30% from the 1996 baseline EI on a 90-day rolling average basis. The plan must be submitted no later than December 31 of the year preceding the appropriate compliance date in §117.9320 of this title. Each control plan must be approved by the executive director before the owner or operator may use the source cap available under this section for compliance. At a minimum, the control plan must include the emission point number (EPN), facility identification number (FIN), and 1996 baseline EI NOx emissions (in ppd) from each cement kiln at the account; a description of the control measures that have been or will be implemented at each cement

kiln; and an explanation of the recordkeeping procedure and calculations that will be used to demonstrate compliance.

(c) Beginning on March 31 of the year following the appropriate compliance date in §117.9320 of this title, the owner or operator shall submit an annual report no later than March 31 of each year to the executive director, the appropriate regional office, and any local air pollution control program with jurisdiction that demonstrates that the overall reduction of NOx emissions from all cement kilns at the account is at least 30% from the 1996 baseline EI on a 90-day rolling average basis. At a minimum, the report must include the EPN, FIN, and each 90-day rolling average NOx emissions (in ppd) during the preceding calendar year for the cement kilns at the account.

(d) All representations in control plans and annual reports become enforceable conditions. The owner or operator shall not vary from such representations if the variation will cause a change in the identity of the specific cement kilns subject to this section or the method of control of emissions unless the owner or operator submits a revised control plan to the executive director, the appropriate regional office, and any local air pollution control program with jurisdiction no later than 30 days after the change. All control plans and reports must demonstrate that the total NOx emissions (in ppd) from all cement kilns at the account (including any cement kilns placed into service on or after December 31, 1999) are being reduced to at least 30% less than the total NOx emissions (in ppd) from all cement kilns in the account's 1996 EI on a 90-day rolling average basis.

(e) The NOx emissions monitoring required by §117.3140 of this title (relating to Continuous Demonstration of Compliance) for each cement kiln in the source cap must be used to demonstrate continuous compliance with the source cap.

(f) An owner or operator may use §117.9800 of this title (relating to Use of Emission Credits for Compliance) to meet the NOx emission control requirements of this section, in whole or in part.

§117.3123. Dallas-Fort Worth Eight-Hour Ozone Attainment Demonstration Control Requirements.

(a) In accordance with the compliance schedule in §117.9320(c) of this title (relating to Compliance Schedule for Cement Kilns), the owner or operator of any portland cement kiln located in Ellis County shall not allow the total nitrogen oxides (NOx) emissions from all cement kilns located at the account to exceed the source cap limitation determined according to subsection (b) of this section. The source cap limitation of this section only applies from March 1 through October 31 of each calendar year. Compliance with the 30-day rolling average cap must be demonstrated beginning on March 31 of each calendar year.

(b) The NOx source cap for an account subject to this section must be calculated according to the following equation.

Figure: 30 TAC §117.3123(b)

$$Cap_{8hour} = \frac{(N_W \times K_W) + (N_D \times K_D)}{2000 \frac{pounds}{ton} \times 365 \frac{days}{year}}$$

Where:

Cap_{8hour}	=	total allowable NOx emissions from all cement kilns located at an account, tons per day, 30-day rolling average basis;
K_D	=	1.7 pounds NOx per ton of clinker for dry preheater-precalciner or precalciner kilns;
K_W	=	3.4 pounds NOx per ton of clinker for long wet kilns;
N_D	=	the average annual production in tons of clinker plus one standard deviation for the calendar years 2003, 2004, and 2005, as reported to the commission's Industrial Emissions Assessment Section, from all dry preheater-precalciner or precalciner kilns located at the account; and
N_W	=	the average annual production in tons of clinker plus one standard deviation for the calendar years 2003, 2004, and 2005, as reported to the commission's Industrial Emissions Assessment Section, from all long wet kilns located at the account.

(c) The monitoring required by §117.3142 of this title (relating to Emission Testing and Monitoring for Eight-Hour Attainment Demonstration) for each cement kiln subject to this section must be used to demonstrate continuous compliance with the source cap requirements of this section. Compliance with the source cap must be demonstrated on a 30-day rolling average basis, calculated according to §117.3142 of this title.

(d) For any portland cement kiln not operational prior to calendar year 2006 and that is located at an account subject to this section, the following requirements apply.

(1) The cement kiln is subject to the source cap of this section but must not be included in the source cap calculation in subsection (b) of this section.

(2) The requirements of §117.3142 of this title and §117.3145 of this title (relating to Notification, Recordkeeping, and Reporting Requirements) apply.

(3) The NO_x emissions from the kiln must be included in the calculation of 30-day rolling average NO_x emissions according to §117.3142 of this title for compliance with the source cap in subsection (b) of this section.

(e) The owner or operator of each portland cement kiln located in Ellis County shall submit a control plan to the Office of Compliance and Enforcement, the appropriate regional office, and the Chief Engineer's Office, for compliance with the source cap in subsection (b) of this section. The plan must be submitted according to the compliance schedule in §117.9320(c) of this title.

(1) At a minimum, the control plan must include:

(A) the emission point number for each kiln at the account;

(B) the facility identification number for each kiln at the account;

(C) the source cap for the account calculated according to the equation in subsection (b) of this section; and

(D) a description of the control measures that have been or will be implemented for each cement kiln for compliance with the source cap.

(2) A revised control plan may be submitted by the owner or operator, along with any required permit applications. Such a plan must adhere to the requirements of this division (relating to Cement Kilns).

(f) (NOT PART OF SIP REVISION)

(g) An owner or operator may use §117.9800 of this title (relating to Use of Emission Credits for Compliance) to meet the NOx emission control requirements of this section, in whole or in part.

§117.3140. Continuous Demonstration of Compliance.

(a) Nitrogen oxides (NOx) monitors. In accordance with the compliance schedule in §117.9320 of this title (relating to Compliance Schedule for Cement Kilns), the owner or operator shall install, calibrate, maintain, and operate a continuous emissions monitoring system (CEMS) or predictive emissions monitoring system (PEMS) to monitor kiln exhaust NOx.

(b) CEMS requirements. The owner or operator of any CEMS used to meet the monitoring requirement of subsection (a) of this section shall comply with the following.

(1) The CEMS must meet the requirements of 40 Code of Federal Regulations Part 60 as follows:

(A) §60.13;

(B) Appendix B, Performance Specification 2, for NOx; and

(C) audits in accordance with Section 5.1 of Appendix F, quality assurance procedures, except that a cylinder gas audit or relative accuracy audit may be performed in lieu of the annual relative accuracy test audit (RATA) required in Section 5.1.1.

(2) One CEMS may be shared among kilns, provided:

(A) the exhaust stream of each kiln is analyzed separately; and

(B) the CEMS meets the certification requirements of paragraph (1) of this subsection for each exhaust stream.

(3) The CEMS is subject to the approval of the executive director.

(c) PEMS requirements. The owner or operator of any PEMS used to meet the monitoring requirement of subsection (a) of this section shall comply with the following.

(1) The PEMS must predict the NOx emissions in the units of the applicable emission limitations of this division (relating to Cement Kilns).

(2) The PEMS must meet the requirements of §117.8100(b) of this title (relating to Emission Monitoring System Requirements for Industrial, Commercial, and Institutional Sources).

§117.3142. Emission Testing and Monitoring for Eight-Hour Attainment Demonstration.

(a) An owner or operator of any portland cement kiln that is subject to the source cap of §117.3123 of this title (relating to Dallas-Fort Worth Eight-Hour Ozone Attainment Demonstration Control Requirements) shall comply with the following monitoring requirements.

(1) The nitrogen oxides (NOx) monitoring requirements of §117.3140 of this title (relating to Continuous Demonstration of Compliance) apply. The following requirements also apply.

(A) For a single portland cement kiln with multiple exhaust stacks, each individual stack must be analyzed separately.

(B) One continuous emission monitoring system (CEMS) may be shared among portland cement kilns or among multiple exhaust stacks on a single portland cement kiln, provided:

(i) the exhaust stream of each stack is analyzed and reported separately; and

(ii) the CEMS meets the certification requirements of §117.3140(b) of this title for each exhaust stream while the CEMS is operating in the time-shared mode.

(C) All bypass stacks must be monitored continuously, in order to quantify emissions directed through the bypass stack. If the CEMS is located upstream of the bypass stack then:

(i) no effluent streams from other potential sources of NO_x emissions may be introduced between the CEMS and the bypass stack; and

(ii) the owner or operator shall install, operate, and maintain a continuous monitoring system to record automatically the date, time, and duration of each event when the bypass stack is open.

(2) Stack exhaust flow rate must be monitored with a flow meter using the monitoring specifications of 40 Code of Federal Regulations (CFR) Part 60, Appendix B, Performance Specification 6 or 40 CFR Part 75, Appendix A.

(3) For portland cement kilns that inject ammonia or urea for NO_x control, fuel type notwithstanding, ammonia emissions must be monitored according to one of the methods specified in §117.8130(1), (2), or (4) of this title (relating to Ammonia Monitoring) to demonstrate compliance with the ammonia emission specification in §117.3123(f) of this title. The ammonia monitoring requirements of this paragraph only apply from March 1 to October 31 of each calendar year, or any other time the owner or operator injects ammonia or urea for NO_x control.

(4) Installation of monitors must be performed in accordance with the schedule specified in §117.9320(c) of this title (relating to Compliance Schedule for Cement Kilns).

(b) The owner or operator of a portland cement kiln subject to the source cap requirements of §117.3123 of this title shall calculate NOx emissions for determining compliance with the source cap as follows. The calculation requirements of this subsection only apply from March 1 to October 31 of each calendar year.

(1) Hourly NOx emissions. Hourly NOx emissions for each kiln must be calculated according to the following equation.

Figure: 30 TAC §117.3142(b)(1)

$$EH = C \times F \times K \times \frac{60\text{min}}{\text{hour}}$$

Where:

EH	=	total hourly NOx emissions from each kiln located at the account, in pounds per hour;
C	=	the block hour average NOx concentration, determined in accordance with subsection (a)(1) of this section, in parts per million by volume (ppmv), dry basis;
F	=	the block average exhaust flow rate, determined in accordance with subsection (a)(2) of this section, in dry standard cubic feet per minute; and
K	=	conversion factor, 1.194×10^{-7} pounds per standard cubic foot per ppmv (40 CFR Part 60, Appendix A, Method 19, Table 19-1).

(2) Daily NOx emissions. The daily total NOx emission for each kiln must be calculated as the sum of the hourly NOx emissions for each calendar day, reported in tons per day, and must be calculated according to the following equation.

Figure: 30 TAC §117.3142(b)(2)

$$ED = \frac{\sum_{i=1}^{N} EH_i}{2000}$$

Where:

ED = total daily NOx emissions from each kiln located at the account, in tons per day;

EH = total hourly NOx emissions from each kiln located at the account, in pounds per hour calculated according to the equation in subsection (b)(1) of this section; and

N = number of hours of operation per day for each kiln located at the account, in hours.

(3) Thirty-day rolling average. The 30-day rolling average NOx emissions for the account must be calculated according to the following equation.

Figure: 30 TAC §117.3142(b)(3)

$$E_{30day} = \frac{\sum_{i=1}^{K}\sum_{j=1}^{N} ED_{i,j}}{N}$$

Where:

E_{30day} = 30-day rolling average NOx emissions in tons per day for the account, computed for the preceding 30 days;

ED = total daily NOx emissions from each kiln located at the account, in tons per day, calculated according to the equation in subsection (b)(2) of this section;

K = number of kilns located at the account; and

N = preceding 30 days.

§117.3145. Notification, Recordkeeping, and Reporting Requirements.

(a) Notification. The owner or operator of each portland cement kiln shall submit verbal notification to the executive director of the date of any continuous emissions monitoring system (CEMS) or predictive emissions monitoring system (PEMS) performance evaluation conducted under §117.3140 or §117.3142 of this title (relating to Continuous Demonstration of Compliance; and Emission Testing and Monitoring for Eight-Hour Attainment Demonstration) at least 15 days before such date followed by written notification within 15 days after testing is completed.

(b) Reporting of test results. The owner or operator of each portland cement kiln shall furnish the executive director and any local air pollution control agency having jurisdiction a copy of any CEMS or PEMS relative accuracy test audit conducted under §117.3140 or §117.3142 of this title:

(1) within 60 days after completion of such testing or evaluation; and

(2) not later than the appropriate compliance date in §117.9320 of this title (relating to Compliance Schedule for Cement Kilns).

(c) Recordkeeping. The owner or operator of a portland cement kiln subject to the requirements of this division (relating to Cement Kilns) shall maintain written or electronic records of the data specified in this subsection. Such records must be kept for a period of at least five years and must be made available upon request by authorized representatives of the executive director, United States Environmental Protection Agency, or local air pollution control agencies having jurisdiction. The records must include:

(1) for each kiln subject to §117.3110 or 117.3120 of this title (relating to Emission Specifications; and Source Cap), monitoring records of:

(A) daily and rolling 30-day average (and, for each kiln subject to the source cap in §117.3120 of this title, rolling 90-day average) nitrogen oxides (NOx) emissions (in pounds);

(B) daily and rolling 30-day average (and, for each kiln subject to the source cap in §117.3120 of this title, rolling 90-day average) production of clinker (in United States short tons); and

(C) average NOx emission rate (in pounds per ton (lb/ton) of clinker produced) on the basis of a rolling 30-day average (and, for each kiln subject to the source cap in §117.3120 of this title, a rolling 90-day average);

(2) records of the results of initial certification testing, evaluations, calibrations, checks, adjustments, and maintenance of CEMS and PEMS;

(3) records of the results of any stack testing conducted; and

(4) for each kiln subject to the source cap in §117.3123 of this title (relating to Dallas-Fort Worth Eight-Hour Ozone Attainment Demonstration Control Requirements) and emission testing and monitoring requirements in §117.3142 of this title:

(A) records of the control plan required under §117.3123 of this title;

(B) hourly records of the average NOx concentration in parts per million by volume;

(C) hourly records of the NOx emissions in pounds per hour;

(D) daily records of the NOx emissions in tons per day;

(E) daily records of the NOx emissions in tons per day expressed as a 30-day rolling average;

(F) hourly records of the average exhaust gas flow rate in dry standard cubic feet per minute; and

(G) records of ammonia monitoring required under §117.3142(a)(3) of this title.