ORAL ARGUMENT NOT YET SCHEDULED

IN THE UNITED STATES COURT OF APPEALS FOR
THE DISTRICT OF COLUMBIA CIRCUIT

SIERRA CLUB, *et al.*,)
Petitioners,)
v.) No. 13-1112
)
UNITED STATES ENVIRONMENTAL)
PROTECTION AGENCY, *et al.*,)
Respondents.)
)

MOTION FOR STAY PENDING JUDICIAL REVIEW OR FOR EXPEDITED REVIEW

Petitioners move for a stay pending judicial review of EPA final action that delays compliance with air toxics limits for cement plants. 78 Fed. Reg. 10,006 (Feb. 12, 2013) ("2013 Rule"), Ex.A. The 2013 Rule delays the date by which cement plants must reduce their emissions of mercury, hydrogen chloride, organic hazardous air pollutants, and particulate matter for two years, from September of this year until September 2015. This delay violates the Clean Air Act and, by EPA's own estimates, will cause between 1,920 and 5,000 preventable premature deaths.

Petitioners' members are exposed to cement plants' toxic emissions where they live, work, and recreate, and will be irreparably harmed by the delay unless a stay is granted. Petitioners specifically seek a stay pending judicial review of EPA's revision of the compliance date specified in 40 C.F.R. §63.1351(c) from Sept. 9, 2013, to Sept. 9, 2015. 78 Fed. Reg. 10,053/2 (revising 40 C.F.R. §63.1351(c)); *see also id.* 10,024/1 ("EPA is revising the compliance date for existing sources for [particulate matter], [total hydrocarbons], [hydrogen chloride], and [mercury] to be September 9, 2015.”); 76 Fed. Reg. 2832, 2837/1 (Jan. 18, 2011) (direct final rule) (revising 40 C.F.R. §63.1351(c) to have compliance date of Sept. 9, 2013). If the Court denies a stay, Petitioners respectfully request that it grant expedited consideration of the case.[1]

BACKGROUND

I. FACTUAL BACKGROUND

The air pollutants cement plants emit are extremely dangerous. Particulate matter (“PM”) causes death and cardiovascular harms, like heart attacks, that can require emergency room visits and hospitalization. 78 Fed. Reg. 3086, 3103/2-04/1 (Jan. 15, 2013) (adding that PM may cause developmental harms and lung cancer). It is dangerous for all, but particularly for children, seniors, and people with pre-existing heart or lung conditions. *Id.* 3104/1. There is no known threshold below which PM is not dangerous. *E.g.*, *id.* 3140/1. PM also likely harms vegetation and ecosystems, especially near cement plants. *Id.* 3203/2. Fine PM—particles measuring 2.5 microns or less—is especially dangerous. EPA has estimated that reducing cement plants’ fine PM emissions alone will prevent between 960 and 2,500 premature deaths every year. 75 Fed. Reg. 54,970, 55,026 tbl.13 (Sept. 9, 2010) (“2010 Rule”).

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[1] Although Petitioners do not believe EPA has authority to stay Clean Air Act rules except for three months as provided in Clean Air Act §307(d)(7)(B), 42 U.S.C. §7607(d)(7)(B), Petitioners filed a precautionary request with EPA for a stay pending judicial review on Apr. 5, 2013. Ex.B. EPA has not responded. Petitioners informed EPA by telephone on Apr. 16, 2013, of their intention to file this motion.

Mercury is notoriously hazardous. Children's exposure *in utero* can cause neuro-developmental harms, and exposure outside the womb also harms brain development. EPA-HQ-OAR-2002-0051-2898 ("NRDC Comments") 2-4, Ex.C. Mercury can also harm adults neurologically and has been linked to cardiovascular problems. *Id.* 4-5. It persists in watersheds, accumulating in fish and other wildlife, and ultimately in humans. *Id.* 8. Nearly every state—48 of the 50—has posted health advisories for mercury in fish, affecting 35% of total U.S. lake acreage and about 25% of U.S. river miles. *Id.* 8-9.

Also highly dangerous and persistent in the environment are cement plants' emissions of non-mercury metals, such as arsenic, chromium, and lead, for which EPA uses PM as a surrogate. These hazardous substances cause a range of harms that include cancer, skin and lung irritation, neurological effects, cardiovascular effects, and reproductive and developmental effects. 68 Fed. Reg. 26,690, 26,692-94 (May 16, 2003); 63 Fed. Reg. 14,182, 14,184/3 (Mar. 24, 1998). *See generally* EPA, *Deposition of Air Pollutants to the Great Waters, First Report to Congress* (1994), Executive Summary, at ix-x, Ex.D; NRDC Comments 21-25.

Total hydrocarbons ("THC") is EPA's surrogate for non-dioxin organic hazardous air pollutants, which include acetaldehyde, benzene, formaldehyde, and polycyclic organic matter ("POM"). 63 Fed. Reg. 14,184/3, 14,187/3. These pollutants cause cancer, as well as neurological, blood, gastrointestinal, developmental, and liver harms. *Id.* 14,184/3-85/1. A persistent bioaccumulative toxic, 42 U.S.C.

§7412(c)(6), POM consists of a range of chemical compounds, including polycyclic aromatic hydrocarbons such as naphthalene that are at least probable carcinogens. 76 Fed. Reg. 57,106, 57,308/3-09/1 (Sept. 15, 2011). POM can also cause skin problems and may affect reproduction and child development. *Id.* 57,308/3; EPA, Polycyclic Organic Matter (POM), last updated Nov. 6, 2007, epa.gov/ttn/atw/hlthef/polycycl.html.

Hydrogen chloride ("HCl") "can cause damage to eyes, nose, throat, and the upper respiratory tract as well as pulmonary edema, bronchitis, gastritis, and dermatitis." 75 Fed. Reg. 54,985/3. "Exposure to HCl can lead to RADS, a chemically- or irritant-induced type of asthma." 78 Fed. Reg. 10,028/3. Children may be more vulnerable to HCl pollution than adults. *Id.*

II. REGULATORY BACKGROUND

More than a decade ago, this Court ordered EPA to set emission standards under Clean Air Act §112 for cement plants' emissions of mercury, HCl, and THC. *National Lime Ass'n v. EPA*, 233 F.3d 625, 634 (D.C. Cir. 2000). EPA did not issue these standards until 2010. 75 Fed. Reg. 54,970.

The 2010 Rule established first-time limits on cement plants' emissions of mercury, HCl, and THC. It also strengthened PM limits that were less stringent than the Act required. *Id.* 54,987/3. The 2010 Rule granted existing cement plants the statutory maximum of three years to comply. *Id.* 54,993/2 (citing 42 U.S.C.

§7412(i)(3)(A)). Thus, the standards would have begun reducing cement plants' pollution in September of this year.

Cement companies and their umbrella organization, the Portland Cement Association ("PCA"), petitioned for review of the 2010 Rule. This Court remanded for EPA to provide reconsideration on one issue, whether the agency should include cement kilns that burn waste ("CISWI kilns") when it calculates the stringency of the emission standards. *PCA v. EPA*, 665 F.3d 177, 189 (D.C. Cir. 2011). It otherwise rejected PCA's claims, and denied PCA's request to stay the 2010 Rule pending EPA's reconsideration process. *Id.* 185, 188-189.[2]

EPA has indicated that removing the CISWI kilns from its database had no effect on any of the emission standards except the PM standard for existing kilns, which EPA increased from .04 pounds per ton of clinker (lb/ton) to .05 lb/ton. 78 Fed. Reg. 10,010/2-3, 10,017/1, 10,021/1-2. The agency described this as a "minimal" change that would leave kilns' compliance strategy "unaltered." 76 Fed. Reg. 28,318, 28,322/3 (May 17, 2011); *see also* EPA Supp. Br. 8, *in PCA* (describing PM standards after removing CISWI kilns as "virtually identical"), Ex.E.

Following the 2011 *PCA* decision, however, PCA and EPA entered into a private "settlement" of the already-decided case, in which the agency agreed to propose an extension of the 2013 existing source compliance date "[i]f supported by

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[2] The *PCA* decision did stay one part of the 2010 Rule, its work practice requirements for clinker storage piles. *Id.* 189. Those requirements are not at issue here.

the administrative record." 77 Fed. Reg. 27,055, 27,056/2 (May 8, 2012). For reasons unrelated to the *PCA* decision or its reconsideration process, EPA then purported to discover a technical problem with its method for demonstrating compliance with the PM standard that neither the agency nor any commenter had noticed before. 77 Fed. Reg. 42,368, 42,374/1 & n.8 (July 18, 2012). Citing this newly discovered glitch, EPA doubled the new source standard from .01 lb/ton to .02 lb/ton, 78 Fed. Reg. 10,026/2, and increased the existing source standard from .05 lb/ton to .07 lb/ton, *id.* 10,017/1. Although EPA maintains that the new standards are essentially the same as the old standards, *id.*, it also asserts that they "open up different compliance alternatives from those under the 2010 rule," *id.* 10,023/1. PCA agreed that the new standards would allow plants to continue using technology that "<u>cannot achieve</u> the [2010 Rule's PM standard]." EPA-HQ-OAR-2011-0817-0505 at 8 (emphasis in original), Ex.F. Individual plants reported that they would be able to do less to comply with the standards. *Id.* app.D 10 (describing changes to existing filter that would have been necessary to comply with 2010 Rule but no longer are); *id.* 21, 23, 25, 27, 29 (existing PM control devices may be retained under new standard, but would have been replaced under 2010 Rule). EPA delayed the compliance date in the 2010 Rule by two years—from September 2013 to September 2015—so that cement companies could deploy different and less effective control measures than the ones they would have used to meet the 2010 Rule. 78 Fed. Reg. 10,023-24, 10,025/3. And, in that time, plants will be allowed to emit more pollution than they otherwise would.

ARGUMENT

A stay's issuance depends on balancing four factors: (1) the likelihood of success on the merits of the petitioners' claims; (2) whether the petitioners will suffer irreparable harm without a stay; (3) whether a stay will substantially harm other parties; and (4) the public interest. D.C. Cir. R.18(a)(1); *see, e.g.*, *Davis v. Pension Ben. Guar. Corp.*, 571 F.3d 1288, 1291 (D.C. Cir. 2009); *Wash. Metro. Area Transit Comm'n v. Holiday Tours*, 559 F.2d 841, 843 (D.C. Cir. 1977). All favor Petitioners.

I. PETITIONERS ARE LIKELY TO SUCCEED ON THE MERITS.

A. EPA's Delayed Compliance Date Violates Clean Air Act §112(i)(3)(A).

1. EPA's Delayed Compliance Date Is Not As Expeditious As Practicable.

Clean Air Act §112(i)(3)(A) requires existing sources to come into compliance with emission standards "as expeditiously as practicable, but in no event later than 3 years after the effective date of such standard," subject to limited exceptions. 42 U.S.C. §7412(i)(3)(A); *see also id.* §7412(i)(3)(B), (i)(4)-(6) (exceptions relevant to existing cement plants). One such exception is a case-by-case extension for plants that need additional time to install controls. *Id.* §7412(i)(3)(B). Congress thus made clear its conclusion that plants can comply within three years or less and that any extensions of the compliance date beyond three years should be granted only on a case-by-case basis and only where the permitting authority concludes that such time is "necessary for the installation of controls." *Id.* §7412(i)(3), (i)(3)(B).

Since its promulgation, the 2010 Rule has not been changed in any way that would prevent plants from meeting the 2013 compliance deadline. The *PCA* decision left the 2010 Rule in place and denied PCA's request for a stay of the entire 2010 Rule, meaning that the rule's compliance date has remained applicable for plants continuously since its promulgation over two-and-a-half years ago. 665 F.3d at 189. For its part, EPA only made the rule weaker. Thus, nothing has occurred since the 2010 Rule's promulgation either to lift its applicability or to make it more difficult for cement plants to come into compliance. It was practicable for cement plants to meet the 2013 compliance deadline when EPA promulgated the 2010 Rule, and it is practicable for cement plants to meet it now.

EPA does not claim otherwise, but argues that its decision to weaken the PM standard "open[s] up different compliance alternatives from those under the 2010" Rule and that cement companies need more time if they wish to deploy these alternatives. 78 Fed. Reg. 10,023/1, 10,024/1 & n.14. The Act, however, requires compliance "as expeditiously as practicable"—not "as long as it takes to deploy the cheapest possible compliance alternative." It is "practicable" for cement companies to meet the weakened PM standard in the 2013 Rule using the same control strategies they chose to meet the 2010 standards. Thus, it is still "practicable" to meet the September 2013 deadline. *See Black's Law Dictionary* 1172 (6th ed. 1990) ("practicable" means "that which may be done, practiced, or accomplished; that which is performable, feasible, possible"). Congress's unambiguously expressed intent to provide long-overdue protection against hazardous air pollutants "as expeditiously as practicable" must be respected even if it conflicts with EPA's policy goal of allowing cement plants to use cheaper controls.

EPA also argues that if it does not delay compliance, sources would have to "install one technology and rip it out in short order to install another." *Id.* 10,024/3. That claim is nonsensical. Because any technology cement plants would install to meet the 2010 Rule will also allow them to meet the weakened PM standard in the 2013 Rule, it would not need to be replaced.

2. EPA Lacks Authority To Delay The 2013 Compliance Date.

Citing this Court's holding that "only the effective date of Section 112 emissions standards matters when determining the maximum compliance date" for §112 standards, EPA argues that §112(i)(3)(A) allows it to extend compliance dates by three years any time it elects to amend emission standards. 78 Fed. Reg. 10,024/2 (quoting *NRDC v. EPA*, 489 F.3d 1364, 1373 (D.C. Cir. 2007)). Whether EPA has such authority is irrelevant here. It is "practicable" for cement plants to meet the existing 2013 deadline, and §112(i)(3)(A) requires compliance as "expeditiously as practicable." 42 U.S.C. §7412(i)(3)(A). If the Court reaches the issue of EPA's authority, however, it should find that EPA may not defeat §112(i)(3)(A)'s 3-year outside limit on compliance deadlines just by electing to weaken emission standards before their compliance date arrives.

As discussed above, weakening standards does not make it less "practicable" to meet an existing deadline. Thus, the text of §112(i)(3)(A) itself precludes such gamesmanship.

Further, if EPA could reset compliance dates just by electing to weaken emission standards, it could put off compliance with emission standards forever. The Supreme Court has categorically rejected EPA interpretations that nullify objective limits on its authority, and this Court has specifically rejected as "absurd" the notion that EPA can defeat and effectively nullify deadlines just by continually amending its standards.[3] *S. Coast Air Quality Mgmt. Dist. v. EPA*, 489 F.3d 1245, 1248 (D.C. Cir. 2007) (on reh'g) (refusing to read such a "glaring loophole" into the Act); *see Whitman v. Am. Trucking Ass'ns*, 531 U.S. 457, 485 (2001) ("EPA may not construe the statute in a way that completely nullifies textually applicable provisions meant to limit its discretion.").

Contrary to EPA's claim (at 78 Fed. Reg. 10,024/2), *NRDC* does not support its position. Although the *NRDC* Court rejected EPA's claim there that it could delay compliance deadlines by changing other parts of a regulation, it did not consider—far less endorse—the notion that EPA can delay compliance dates at will just by electing to weaken standards before the compliance dates arrive.

Nor does *PCA* help EPA on this point. EPA implies that because a court can

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[3] There, EPA strengthened the relevant standards. *S. Coast*, 489 F.3d at 1248. It would make even less sense to allow EPA to nullify deadlines by weakening standards.

stay regulations where it believes they may change substantially as the result of that court's decision, EPA may extend regulations' compliance dates whenever the agency decides to change them. *Id.* 10,024/3 (citing *PCA*, 665 F.3d at 189). Contrary to EPA's assumption, a judicial stay is not "effectively" the same as an agency decision to reset compliance dates. The standards for a judicial stay and resetting compliance dates are completely different. *Compare Winter v. NRDC*, 555 U.S. 7, 32 (2008) (balance of equities and public interest "are pertinent in assessing the propriety of any injunctive relief"), *and Davis*, 571 F.3d at 1291 (factors for stay), *with* 42 U.S.C. §7412(i)(3). And EPA conveniently ignores that the *PCA* Court denied PCA's request to stay the actual emission standards at issue. 665 F.3d at 189. Here, EPA is essentially claiming it can grant relief that this Court refused to grant <u>without</u> meeting the standards for issuing a stay.

B. The 2013 Rule Violates §112(d)(7).

EPA's extension of the compliance date is premised entirely on its voluntary decision to weaken the existing source PM standard from .05 lb/ton to .07 lb/ton, a change that EPA says opens up "different compliance alternatives." 78 Fed. Reg. 10,023/1. Because EPA cannot *sua sponte* weaken §112 standards, the agency would have no excuse for delaying the compliance dates even if §112(i)(3)(A) permitted such a delay.[4]

EPA's decision to weaken the PM standard violates Clean Air Act §112(d)(7), which provides "no emission standard … under this section shall be interpreted, construed or applied to diminish or replace the requirements of a more stringent emission limitation … established pursuant to section 7411 of this title [Clean Air Act § 111], part C or D of this subchapter [the Prevention of Significant Deterioration or the nonattainment area provisions], <u>or other authority of this chapter</u> [i.e., the Clean Air Act] or a standard issued under State authority." 42 U.S.C. §7412(d)(7) (emphasis added). Because §112 is an "authority of this chapter" other than those listed, §112(d)(7) unambiguously precludes EPA from applying new §112 standards "to diminish or replace the requirements of a more stringent limitation" under §112.

EPA's interpretation—that §112(d)(7)'s reference to "other authority under this chapter" merely "indicates that a section 112(d) standard does not supplant more stringent standards issued under some authority <u>other than section 112(d)</u>," 78 Fed. Reg. 10,017/3 (emphasis added)—is refuted by §112(d)(7)'s text. Section 112(d)(7) provides that EPA may not weaken standards established under specific Clean Air Act

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[4] EPA here opted to change the PM standard for existing sources from .05 lb/ton to .07 lb/ton, and EPA has made clear that this change had nothing to do with either the *PCA* remand or the reconsideration process. *See supra* at 6; 77 Fed. Reg. 42,374/2 (proposed changes to PM standards "also" incorporate response to remand). Thus, this case does not implicate any EPA authority to alter standards in response to a court remand or a timely reconsideration petition filed under §307(d)(7)(B), 42 U.S.C. §7607(d)(7)(B).

authorities and then adds, without limitation, "or other authority of this chapter." That language makes clear that EPA may not weaken regulations promulgated under either the listed Clean Air Act provisions or "other," unlisted Clean Air Act provisions.

The structure of §112(d)(7) confirms this point. "[T]he word 'other' connotes 'existing besides, or distinct from, that already mentioned or implied.'" *Financial Planning Ass'n v. SEC*, 482 F.3d 481, 489 (D.C. Cir. 2007) (citation omitted). Because "other authority of this chapter" is the final element of a list referring to authorities within the Clean Air Act, the structure of the provision demonstrates that "other authorities of this chapter" means "authorities of this chapter distinct from those already mentioned." *See United States v. Atl. Research Corp.*, 551 U.S. 128, 134-36 (2007) (using structure of statute to determine that "phrase 'any other person' therefore means any person other than those three [listed]"); *Wolf Run Mining Co. v. FMSHRC*, 659 F.3d 1197, 1203 (D.C. Cir. 2011) (using structure of statute to determine what "'[o]ther' plainly refers to").

EPA also argues that if §112(d)(7) is given its plain meaning, the agency could not correct a standard that was "outright technically infeasible." 78 Fed. Reg. 10,024/3 & n.17. But assuming that EPA accidentally set such a standard, there are at least three ways in which it could be "corrected."[5] First, EPA can grant reconsideration under §307(d)(7)(B), which is precisely what EPA did in the agency's own example. 78 Fed. Reg. 10,024 n.17 (citing 76 Fed. Reg. 28,325). Second, parties who believe a standard is infeasible can petition for review. 42 U.S.C. §7607(b). Third, even if an emission standard that is "outright technically infeasible" somehow escapes the attention of both EPA and all affected parties throughout the rulemaking process and until after the period for reconsideration and judicial review have passed, parties can still petition EPA to change the rule under §307(b)(1) and the *Oljato* process. *See id.* §7607(b)(1) (allowing petitions for review based on grounds arising after the 60th day); *Oljato Ch. of Navajo Tribe v. Train*, 515 F.2d 654, 666-667 (D.C. Cir. 1975). EPA's apparent disbelief that Congress did not also allow the agency to weaken standards at will does not trump §112(d)(7)'s plain meaning. *See New Jersey v. EPA*, 517 F.3d 574, 583 (D.C. Cir. 2008) ("EPA's disbelief that it would be prevented from correcting its own listing 'errors' except through section 112(c)(9)'s delisting process or court-sanctioned vacatur cannot overcome the plain text enacted by Congress.").

II. UNLESS THE CHALLENGED PROVISIONS ARE STAYED, PETITIONERS WILL SUFFER IRREPARABLE HARM.

Judicial review will extend past the Sept. 9, 2013, compliance date established in

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[5] This Court has soundly and repeatedly rejected EPA's persistent assumption that §112 standards must conform to its beliefs about what is "achievable." *E.g.*, *Sierra Club v. EPA*, 479 F.3d 875, 878-879, 884 (D.C. Cir. 2007).

the 2010 Rule. Even the expedited judicial review of the 2010 Rule took over a year from its promulgation. Consequently, staying the 2013 Rule's illegal provisions will prevent irreparable harm that will occur if these provisions remain in effect.

EPA itself says that, in the two years from September 2013 to September 2015, cement plants will emit over 33,000 additional pounds of mercury into the environment. *See* EPA-HQ-OAR-2002-0051-3438 at 6, Ex.H. They will emit more than 22,000 tons of PM, 13,700 tons of THC, and almost 12,000 tons of HCl beyond what the standards allow. *See id.* In addition, because the controls necessary to meet the PM and HCl standards will substantially reduce emissions of fine PM, delaying these controls will allow plants to emit far more of this especially dangerous pollutant. *See* 78 Fed. Reg. 10,028/2; 75 Fed. Reg. 55,026-27 & tbl.13.

Petitioners have members who live, work, and recreate in close proximity to cement plants that currently are allowed to and do emit more of these pollutants than either the 2010 Rule or the 2013 Rule allows. *See* declarations, Ex.J. For example, the Lyons, CO, cement plant emits about three times the PM and mercury either rule allows, and Petitioners have members who live, work, and recreate close to it. *See id.* Sierra Club member Richard Cargill, age 74, enjoys growing large quantities of his own food, alongside his 8-year-old grandson, and taking long walks into the Colorado countryside near his home. Cargill Decl. ¶¶1-2, 6-8, 10. He lives only 2 miles from the Lyons plant. *Id.* ¶2. Both he and his grandson are especially vulnerable to PM pollution. *See* 78 Fed. Reg. 3104/1.

Similarly, Downwinders At Risk member Sue Pope is 72 and has heart and lung problems so severe that she is on oxygen all the time. Pope Decl. ¶¶1-2, 7. She lives on property that is only 7.5 miles downwind of the TXI cement plant in Midlothian, TX, and when she knows the plants in her area are operating, she goes inside. *See id.* ¶¶4, 8. EPA says the plant will have to reduce its PM and mercury emissions to comply with the standards. Bornhorst Decl. ¶¶8-9. By prolonging her and her property's exposure to these highly dangerous pollutants, the 2013 Rule plainly harms her.

Petitioners also have members who live, work, and recreate near numerous other plants that will similarly have to upgrade their controls and reduce their emissions, like those in Kern County, CA; Three Forks, MT; Pima County, AZ; and many more. *See* declarations. Thus, the delay in the compliance date will cause Petitioners' members to breathe or ingest more of the hazardous pollution cement plants emit than they would in the absence of a stay.

Being forced to breathe additional PM and fine PM pollution into their bodies harms Petitioners' members. So too does being forced to breathe in or ingest toxic metals, such as chromium, lead, and mercury; organic carcinogens such as benzene, formaldehyde, and POM; and HCl. Additional exposure to all of these pollutants also increases the likelihood that Petitioners' members will suffer death, heart attacks, cancer, and other adverse health effects. And the additional delay will prolong the period in which Petitioners' members are prevented from enjoying—or must refrain altogether from—day-to-day activities as basic as walking and gardening in their own homes and communities. These harms are serious, and cannot be undone. *See, e.g.*, *Michigan v. Army Corps of Eng'rs*, 667 F.3d 765, 788 (7th Cir. 2011) ("Environmental injury, by its nature, can seldom be adequately remedied by money damages and is often permanent or at least of long duration, *i.e.*, irreparable." (quoting *Amoco Prod. Co. v. Vill. of Gambell*, 480 U.S. 531, 545 (1987))); *New Mexico v. Watkins*, 969 F.2d 1122, 1137 (D.C. Cir. 1992) (same); *Nat'l Ass'n of Farmworkers Orgs. v. Marshall*, 628 F.2d 604, 613-14 (D.C. Cir. 1980) (exposure of those known to be especially susceptible to '"high-risk"' and '"highly toxic"' substances constitutes irreparable harm).

III. THE PUBLIC INTEREST STRONGLY FAVORS A STAY, AND OTHER PARTIES WILL NOT BE HARMED BY A STAY.

EPA itself has made clear that when cement plants come into compliance with the new standards, the resulting reductions in fine PM pollution alone will prevent between 960 and 2,500 premature deaths every year. 75 Fed. Reg. 55,026-55,027 tbl.13. They will also prevent 1,500 non-fatal heart attacks, 1,000 emergency room visits, and 130,000 lost work days. *Id.* By delaying the compliance date, the 2013 Rule will have the opposite effect. Over two years, it will <u>cause</u> between 1,920 and 5,000 premature deaths, 3,000 non-fatal heart attacks, 2,000 emergency room visits, 34,000 cases of aggravated asthma, and 260,000 lost days of work. *See id.* Moreover, EPA is not writing on a blank slate: the emission reductions at issue are already nearly 13 years overdue. During that time, EPA has been violating the law, and people have been suffering—between 12,480 and 32,500 unnecessary deaths, 19,500 unnecessary nonfatal heart attacks, 221,000 unnecessary cases of aggravated asthma, and 1,690,000 unnecessary missed days of work—contrary to the public interest. *See id.* The public interest thus strongly favors staying the 2013 Rule.

As the agency responsible for the proper execution of the Clean Air Act, EPA cannot be substantially harmed by a stay that would prevent it from giving effect to portions of a rule that contradicts the letter and spirit of the Act. *See Nat'l Ass'n of Farmworkers*, 628 F.2d at 615 ("consequences [that] are no different from [agency's] burdens under the statutory scheme" "do not constitute substantial harm for the purpose of delaying injunctive relief").

Nor will cement companies suffer cognizable harm. The only effect of the stay will be to prevent an unlawful delay of the compliance date from having effect pending litigation. The compliance date set out in the 2010 Rule reflects the maximum time for compliance that the Clean Air Act allows. Compliance with the law is not a harm. *Cf. Nken v. Holder*, 556 U.S. 418, 435 (2009) (deportation of aliens does not constitute irreparable harm because statute allows deportees to pursue appeals despite removal); *id.* 436 (public interest is served by following statute and by ending "a continuing violation of United States law" (internal quotation marks omitted)).

EPA has suggested that some cement companies may already have delayed compliance with the 2010 Rule in anticipation of getting a longer compliance period and weaker standards in the 2013 Rule. 78 Fed. Reg. 10,023-24. But any harm resulting from those companies' tactical decision to ignore an applicable deadline is entirely self-imposed and thus not part of the stay analysis. Companies have known since 2010 that new, tougher standards would go into effect in 2013. In 2011, the Court upheld most of EPA's methodology for setting those standards, and expressly decided to leave them in effect. *PCA*, 665 F.3d at 189. The Court even noted that "it is unlikely that significant changes will be made to the standards upon reconsideration." *Id.* If rather than comply with the standards, some companies bet that they could get the compliance deadline extended, those companies are in no position to complain if they lose their bet.[6] *See, e.g.*, *Cuomo v. NRC*, 772 F.2d 972, 977 (D.C. Cir. 1985) (rejecting as "not properly the subject of inquiry on a motion for stay" party's claims of harms from stay when harms stem from "self-imposed risk" and "self-imposed costs").

Even if compliance with the 2010 Rule could be viewed as cognizable harm to cement companies in some respect, it would be economic harm that does not counterbalance the public interest and Petitioners' irreparable harms. It is "well settled that economic loss does not, in and of itself, constitute irreparable harm." *Wisc. Gas Co. v. FERC*, 758 F.2d 669, 674 (D.C. Cir. 1985); *accord Davis*, 571 F.3d at 1295 ("we see no reason to depart from the general rule that economic harm does not constitute irreparable injury."). The U.S. cement industry is dominated by a few multinational

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[6] That is especially the case here because the Act provides for extensions for sources that truly need additional time to come into compliance. 42 U.S.C. §7412(i)(3)(B).

corporations. EPA-HQ-OAR-2002-0051-3477 ("*RIA*") 2-18 to -20 & tbl.2-11, Ex.I. In determining economic harm, the entity to look at is the overall parent company, not an individual plant or kiln. *See, e.g.*, *Holiday CVS v. Holder*, 839 F. Supp. 2d 145, 168-169 (D.D.C. 2012) ("courts in this Circuit and elsewhere have found the economic status of a plaintiff's parent corporation to be highly relevant when a plaintiff seeks to show irreparable economic harm."). EPA has further determined that the 2010 Rule "will not have a significant economic impact on the four small" cement companies. *RIA* 4-3. Thus, any economic harm to cement companies from a stay cannot rise to the magnitude required for it to be truly irreparable. *Wisc. Gas*, 758 F.2d at 674 (harm must be "great" and "[r]ecoverable monetary loss may constitute irreparable harm only where the loss threatens the very existence of the movant's business"). *A fortiori*, it does not constitute the irreparable harm that would be necessary to counter Petitioners' irreparable injuries absent a stay.

CONCLUSION

Petitioners easily meet the requirements for a stay of the 2013 Rule's delay of the compliance date from Sept. 9, 2013, to Sept. 9, 2015. Petitioners respectfully request that the Court stay pending judicial review EPA's revision of the compliance date specified in 40 C.F.R. §63.1351(c) from Sept. 9, 2013, to Sept. 9, 2015. If the Court does not stay this revision, Petitioners request that it grant expedited consideration of the case to provide a decision as close to Sept. 9, 2013, as possible.

DATED: April 17, 2013

Respectfully submitted,

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INDEX OF EXHIBITS[*]

Exhibit A	78 Fed. Reg. 10,006 (Feb. 12, 2013) ("2013 Rule")
Exhibit B	Request for Stay Pending Judicial Review of Portions of National Emission Standards for Hazardous Air Pollutants for the Portland Cement Manufacturing Industry (78 Fed. Reg. 10,006 (Feb. 12, 2013)), sent to EPA on Apr. 5, 2013
Exhibit C	Comments of NRDC *et al.* (EPA-HQ-OAR-2002-0051-2898, Sept. 4, 2009) ("NRDC Comments") (excerpt: pp.1-11, 21-25)
Exhibit D	EPA, *Deposition of Air Pollutants to the Great Waters, First Report to Congress* (1994) (excerpt: cover, pp.iii, vi, viii-xii, 18-20, 29-35, 59)
Exhibit E	EPA Suppl. Br., *in PCA v. EPA*, 665 F.3d 177 (D.C. Cir. 2011)
Exhibit F	EPA-HQ-OAR-2011-0817-0505 (PCA comments (Aug. 17, 2012)) (excerpt: pp.1, 4-5, 7-8, app.D 2, 10, 21, 23, 25, 27, 29, 32)
Exhibit G	PCA, *The Impact of a Change in the Cement NESHAP PM Limit On Compliance Strategies and Schedules* (EPA-HQ-OAR-2011-0817-0154, Apr. 9, 2012)
Exhibit H	EPA-HQ-OAR-2002-0051-3438 (Summary of Environmental and Cost Impacts for Final Portland Cement NESHAP and NSPS (Aug. 6, 2010)) (excerpt: cover, inside cover, p.6)
Exhibit I	EPA-HQ-OAR-2002-0051-3477 (EPA, *Regulatory Impact Analysis* ("RIA") (Aug. 2010)) (excerpt: cover, pp.2-18 to -20, 4-3)
Exhibit J	Declarations
Exhibit K	EPA-HQ-OAR-2002-0051-3480 (plant emissions estimates)
Exhibit L	EPA-HQ-OAR-2002-0051-3401 (Facility and Kiln Information: Part 1 of Section 114 ICR Response (July 28, 2009)) (excerpt: pp.1-4, 16-17)

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[*] We include the full document unless otherwise noted.

Exhibit A

NATIONAL ARCHIVES AND RECORDS ADMINISTRATION
1985

FEDERAL REGISTER

Vol. 78 Tuesday,
No. 29 February 12, 2013

Part II

Environmental Protection Agency

40 CFR Parts 60 and 63

National Emission Standards for Hazardous Air Pollutants for the Portland Cement Manufacturing Industry and Standards of Performance for Portland Cement Plants; Final Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 60 and 63

[EPA–HQ–OAR–2011–0817; FRL–9758–6]

RIN 2060–AQ93

National Emission Standards for Hazardous Air Pollutants for the Portland Cement Manufacturing Industry and Standards of Performance for Portland Cement Plants

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: On July 18, 2012, the EPA proposed amendments to the National Emission Standards for Hazardous Air Pollutants for the Portland Cement Manufacturing Industry and the Standards of Performance for Portland Cement Plants. This final action amends the national emission standards for hazardous air pollutants for the Portland cement industry. The EPA is also promulgating amendments with respect to issues on which it granted reconsideration on May 17, 2011. In addition, the EPA is amending the new source performance standard for particulate matter. These amendments promote flexibility, reduce costs, ease compliance and preserve health benefits. The amendments also address the remand of the national emission standards for hazardous air pollutants for the Portland cement industry by the United States Court of Appeals for the District of Columbia Circuit on December 9, 2011. Finally, the EPA is setting the date for compliance with the existing source national emission standards for hazardous air pollutants to be September 9, 2015.

DATES: This final rule is effective on February 12, 2013. The EPA is setting the compliance date for existing open clinker storage piles to be February 12, 2014.

ADDRESSES: The EPA has established a docket for this action under Docket ID No. EPA–HQ–OAR–2011–0817. All documents in the docket are listed in the *http://www.regulations.gov* Web site. Although listed in the index, some information is not publicly available, for example, confidential business information or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, will be publicly available only in hard copy. Publicly available docket materials are available either electronically in *www.regulations.gov* or in hard copy at the EPA Docket Center, EPA West Building, Room 3334, 1301 Constitution Ave. NW., Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744, and the telephone number for the Docket Center is (202) 566–1742.

FOR FURTHER INFORMATION CONTACT: For questions about this final action, contact Ms. Sharon Nizich, Office of Air Quality Planning and Standards; Sector Policies and Programs Division, Minerals and Manufacturing Group (D243–04); Environmental Protection Agency; Research Triangle Park, NC 27111; telephone number: (919) 541–2825; fax number: (919) 541–5450; email address: *nizich.sharon@epa.gov.* For information about the applicability of the NESHAP or NSPS contact Mr. Patrick Yellin, Monitoring, Assistance and Media Programs Division (2227A), Office of Enforcement and Compliance Assurance, U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, Washington, DC 20460; telephone number (202) 654–2970; email address *yellin.patrick@epa.gov.*

SUPPLEMENTARY INFORMATION:

Acronyms and Abbreviations. The following acronyms and abbreviations are used in this document.

APCD	air pollution control devices
CAA	Clean Air Act
CBI	confidential business information
CDX	Central Data Exchange
CEMS	continuous emission monitoring systems
CEDRI	Compliance and Emissions Data Reporting Interface
CFR	Code of Federal Regulations
CISWI	commercial and industrial solid waste incinerators
CMS	continuous monitoring system
COMS	continuous opacity monitoring system
CO_2	carbon dioxide
CPMS	continuous parametric monitoring system
D/F	dioxins and furans
EPA	Environmental Protection Agency
ESP	Electrostatic Precipitators
ERT	Electronic Reporting Tool
FR	Federal Register
gr/dscf	grains per dry standard cubic foot
HAP	hazardous air pollutants
Hg	mercury
HCl	hydrogen chloride
ICR	information collection request
Lb/ton	pound per ton
MACT	maximum achievable control technology
meHg	methylmercury
NAICS	North American Industry Classification System
NAS	National Academy of Science
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NHSM	Nonhazardous Secondary Materials
NO_X	Nitrogen Oxides
NRC	National Research Council
NSPS	new source performance standards
NTTAA	National Technology Transfer and Advancement Act
oHAP	Non-dioxin organic hazardous air pollutants
OMB	Office of Management and Budget
PCA	Portland Cement Association
PM	particulate matter
ppm(v) (d,w)	parts per million (by volume) (dry, wet)
RATA	Relative Accuracy Test Audit
RfD	reference dose
RIA	regulatory impact analysis
RTC	Response to Comment
RTO	regenerative thermal oxidizers
SIP	state implementation plan
SO_2	Sulphur Dioxide
THC	total hydrocarbons
tpy	tons per year
TTN	Technology Transfer Network
$\mu g/m^3$	micrograms per cubic meter
UPL	Upper Prediction Limit
UMRA	Unfunded Mandates Reform Act
TEOM	Tapered Element Oscillating Microbalance
VCS	voluntary consensus standards
WWW	worldwide web

Background Information Document. On July 18, 2012 (77 FR 42368), the EPA proposed to amend the Portland cement manufacturing industry NESHAP and the Portland cement plant new source performance standards (NSPS). In this action, we are taking final action on this proposal. A summary of the public comments on the proposal and the EPA's responses to those comments is available in Docket ID Number EPA–HQ–OAR–2011–0817.

Organization of this Document. The information presented in this preamble is organized as follows:

I. General Information

A. Executive Summary

In this action the EPA is finalizing amendments to the NESHAP for Portland cement plants and to the NSPS for Portland cement plants. These amendments respond to petitions for reconsideration filed by the Portland cement industry and to a decision by the United States Court of Appeals for the District of Columbia Circuit (D.C. Circuit). The EPA is retaining the stack emission standards for mercury, hydrogen chloride (HCl), and total hydrocarbons (THC) under the NESHAP, amending the stack emission standard for particulate matter (PM) under the NESHAP, and making a conforming amendment to the NSPS for PM. The amendments also include provisions which account for commingled HAP emissions from coal mills that are an integral part of the kiln, establish a continuous monitoring regime for parametric monitoring of PM, set work practice standards for startup and shutdown, and revise the compliance date for the PM, mercury, HCl, THC and clinker storage pile existing source standards under the NESHAP. The EPA is also retaining the affirmative defense for civil penalties for violations of emission limits occurring as a result of a malfunction.

These amendments are based on sound technical and legal justifications, and result in cost savings and compliance flexibility for the Portland cement industry. This result is consistent with Executive Order 13563.

1. Purpose of the Regulatory Action

a. Need for the Regulatory Action

The EPA is amending the NESHAP for the Portland cement source category and the NSPS for Portland cement plants issued under sections 112(d) and 111(b) of the Clean Air Act (CAA). The most significant amendment is to the NESHAP and NSPS for PM, to correct monitoring issues with the PM compliance regime as promulgated in the 2010 final rule. As a result of this amendment, the EPA is also setting a compliance date of September 9, 2015, for meeting the PM, mercury, HCl and THC existing source NESHAP.

This final action also addresses the remand by the DC Circuit in *Portland Cement Ass'n* v. *EPA,* 665 F. 3d 177 (DC Cir. 2011). In that case, the court upheld all of the EPA's methodology for establishing the Portland cement NESHAP, denied all petitions for review challenging the NSPS, but also held that the EPA had arbitrarily denied reconsideration of the NESHAP to take into account the effect of the EPA's Nonhazardous Secondary Materials (NHSM) rule on the standards. The NHSM rule, issued after the NESHAP was promulgated, had the effect of reclassifying some cement kilns as commercial and industrial solid waste incinerators (CISWI) and thus could have an effect on the standards. The court also stayed the open storage clinker pile standards.

We are also amending various implementation requirements to provide more compliance flexibility for affected sources. In addition, the amendments address the issues on which the EPA previously granted reconsideration. See 76 FR 28318 (May 17, 2011).

b. Legal Authority for the Regulatory Action

These amendments implement sections 112(d) and 111(b) of the CAA. Section 112 of the CAA establishes a regulatory process to address emissions of hazardous air pollutants (HAP) from stationary sources. After the EPA identifies categories of sources emitting one or more of the HAP listed in section 112(b) of the CAA, section 112(d) requires the EPA to promulgate technology-based NESHAP for those sources. Section 112(i)(3)(A) requires that the compliance date for existing sources shall be ''as expeditiou[s] as practicable,'' but not more than 3 years after a standard's effective date. Section 111 of the CAA requires that NSPS reflect the application of the best system of emission reductions achievable which, taking into consideration the cost of achieving such emission reductions, and any non-air quality health and environmental impact and energy requirements, the Administrator determines has been adequately demonstrated.

2. Summary of Major Provisions

a. PM Emission Standards

As proposed, the EPA is amending the existing and new source PM standards in the NESHAP to require manual stack testing in lieu of PM continuous emission monitoring systems (CEMS) for compliance determinations and requiring that a site-specific parametric operating level be established using a PM continuous parametric monitoring system (CPMS). We are changing the numeric emissions value of those standards for existing sources to 0.07 pounds per ton (lb/ton) clinker based on manual stack testing and 0.02 lb/ton clinker for new and reconstructed sources based on manual stack testing. The PM standards under the NSPS for modified sources are likewise amended to 0.07 lb/ton clinker based on manual stack testing and 0.02 lb/ton clinker for new and reconstructed sources based on manual stack testing.

b. Response to Remand

Consistent with the court's remand, the EPA has removed all of the CISWI kilns from the database used to set the 2010 existing source standards for PM, mercury, HCl and THC. This analysis informed the level of the final standards discussed immediately below.

c. Other Emissions Standards

As proposed, the EPA is changing the alternative organic HAP (oHAP) standard from 9 parts per million (ppm) to 12 ppm. The EPA is not changing the existing or new source standards for mercury, THC or HCl.

d. Standards During Startup and Shutdown

The EPA is amending the emission standards applicable during periods of startup and shutdown from numerical standards to work practice standards.

e. Compliance Dates for NESHAP

As proposed, the EPA is establishing a compliance date of September 9, 2015, for existing source standards for PM, mercury, HCl and THC. The EPA is establishing February 12, 2014, as the compliance date for the standards for existing open clinker storage piles. New source standards continue to apply to all sources which commenced construction or reconstruction after May 6, 2009.

f. Final Action on Reconsideration

The EPA is also taking final action on the remaining issues on which it granted reconsideration on May 17, 2011.

3. Cost Impacts of These Amendments

We estimate that revising the means of demonstrating compliance for the PM, alternative organic HAP standards and requiring work practices for open clinker storage piles will save industry $52 million annually.

4. Summary of Final Standards

Table 1 shows the final standards for the Portland Cement Manufacturing Industry NESHAP and the Portland Cement Plants NSPS.

TABLE 1—EXISTING AND NEW SOURCE STANDARDS

Pollutant	Existing source standard	New source standard
Mercury	55 lb/MM tons clinker	21 lb/MM tons clinker.
THC	24 ppmvd	24 ppmvd.
PM	0.07 lb/ton [a] clinker (3-run test average)	0.02 lb/ton [b] clinker (3-run test average).
HCl	3 ppmvd	3 ppmvd.
Organic HAP (alternative to Total Hydrocarbons).	12 ppmvd	12 ppmvd.

[a] Also applies to NSPS modified sources.
[b] Also applies to NSPS new and reconstructed sources.

B. Does this action apply to me?

Categories and entities potentially regulated by this final rule include:

TABLE 2—INDUSTRIAL SOURCE CATEGORIES AFFECTED BY THIS NESHAP AND NSPS FINAL ACTION

Category	NAICS code [a]	Examples of regulated entities
Industry	327310	Portland cement manufacturing plants.
Federal government		Not affected.
State/local/tribal government		Portland cement manufacturing plants.

[a] North American Industry Classification System.

Table 2 of this preamble is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be regulated by this action. To determine whether your facility will be regulated by this action, you should examine the applicability criteria in 40 CFR 60.60 (subpart F) or in 40 CFR 63.1340 (subpart LLL). If you have any questions regarding the applicability of this final action to a particular entity, contact the appropriate person listed in the preceding **FOR FURTHER INFORMATION CONTACT** section.

C. Where can I get a copy of this document?

In addition to being available in the docket, an electronic copy of this final action will also be available on the World Wide Web (WWW) through the EPA's Technology Transfer Network (TTN). Following signature by the EPA Administrator, a copy of this final action will be posted on the TTN's policy and guidance page for newly proposed or promulgated rules at the following address: *http://www.epa.gov/ttn/oarpg.* The TTN provides information and technology exchange in various areas of air pollution control. In addition, more information can be obtained at the following address: *http://www.epa.gov/airquality/cement.*

D. Judicial Review

Under section 307(b)(1) of the CAA, judicial review of this final action is available only by filing a petition for review in the court by April 13, 2013. Under section 307(b)(2) of the CAA, the requirements established by the final rule may not be challenged separately in any civil or criminal proceedings brought by the EPA to enforce the requirements.

Section 307(d)(7)(B) of the CAA further provides that ''[o]nly an objection to a rule or procedure which was raised with reasonable specificity during the period for public comment (including any public hearing) may be raised during judicial review.'' This section also provides a mechanism for the EPA to convene a proceeding for reconsideration, ''[i]f the person raising an objection can demonstrate to EPA that it was impracticable to raise such objection within [the period for public comment] or if the grounds for such objection arose after the period for public comment (but within the time specified for judicial review) and if such objection is of central relevance to the outcome of the rule.'' Any person seeking to make such a demonstration to us should submit a Petition for Reconsideration to the Office of the Administrator, U.S. EPA, Room 3000, Ariel Rios Building, 1200 Pennsylvania Ave. NW., Washington, DC 20460, with a copy to both the person(s) listed in the preceding **FOR FURTHER INFORMATION CONTACT** section and the Associate General Counsel for the Air and Radiation Law Office, Office of General Counsel (Mail Code 2344A), U.S. EPA, 1200 Pennsylvania Ave. NW., Washington, DC 20460.

II. Background Information

A. What is the statutory authority for these amendments?

Section 112 of the CAA establishes a regulatory process to address emissions of HAP from stationary sources. After the EPA has identified categories of sources emitting one or more of the HAP listed in section 112(b) of the CAA, section 112(d) requires us to promulgate NESHAP for those sources. For ''major sources'' that emit or have the potential to emit 10 tons per year (tpy) or more of a single HAP or 25 tpy or more of a combination of HAP, these technology-based standards must reflect the maximum reductions of HAP achievable (after considering cost, energy requirements and non-air quality health and environmental impacts) and are commonly referred to as maximum achievable control technology (MACT) standards.

The statute specifies certain minimum stringency requirements for MACT standards, which are referred to as ''floor'' requirements. See CAA section 112(d)(3). Specifically, for new sources, the MACT floor cannot be less stringent than the emission control that is achieved in practice by the best controlled similar source. The MACT standards for existing sources can be less stringent than standards for new sources, but they cannot be less stringent than the average emission limitation achieved by the best-performing 12 percent of existing sources (for which the Administrator has emissions information) in the category or subcategory (or the best-performing five sources for categories or subcategories with fewer than 30 sources).

In developing MACT, we must also consider control options that are more stringent than the floor. We may establish standards more stringent than the floor based on the consideration of the cost of achieving the emissions reductions, any non-air quality health and environmental impacts, and energy requirements. See CAA section 112(d)(2).

Under section 112(i)(3)(A), compliance dates for existing sources shall ''be as expeditiou[s] as practicable'', but in no event later than 3 years after the date of publication of the final rule in the **Federal Register**. The EPA may set a revised compliance date of a MACT standard when amending that standard, see *NRDC* v. *EPA,* 489 F. 3d 1364, 1373–74 (D.C. Cir. 2007), but any such amended compliance date must still establish ''compliance as expeditiously as practicable.''

Section 111(b) requires the EPA to set standards for emissions that ''reflect the degree of emission limitation achievable through the application of the best system of emission reduction.'' See CAA section 111(a)(1). In contrast to the NESHAP floor setting process, NSPS requires the EPA to take into account the ''cost of achieving'' emissions reductions, as well as health, environmental, and energy considerations. *Id.*

B. What actions preceded this final rule?

The history of this final rule, commencing with the 1999 standards and proceeding through the amendments issued in September 2009, is set out in detail in 75 FR 54970 (Sept 9, 2010). The Portland Cement Association (PCA) and several cement companies filed petitions for reconsideration of aspects of those amendments (copies of the petitions are in the Portland Cement Reconsideration docket, EPA–HQ–OAR–2011–0817). On May 17, 2011, the EPA granted reconsideration of various issues, and denied the petitions to reconsider as to the remaining issues. See 76 FR 28318 (May 17, 2011). On December 9, 2011, the D.C. Circuit issued an opinion upholding the NESHAP itself (as well as the section 111 NSPS), but finding that the EPA had arbitrarily failed to grant reconsideration to consider the effect of the EPA's NHSM rule on the standards (76 FR 15456 (March 21, 2011)), The NHSM rule had the effect of reclassifying some cement kilns as commercial and solid waste incinerators. See *Portland Cement Ass'n* v. *EPA,* 665 F. 3d 177, 186–189 (D.C. Cir. 2011). The court did not stay any of the numerical emission standards, but did stay the work practice standards for open clinker storage piles pending the conclusion of the reconsideration process. See 665 F. 3d at 194.

In this action, the EPA is responding to the court's remand. For existing sources, the EPA had done so by removing all kilns classified as CISWI units from the data used to establish the 2010 NESHAP standards. The EPA then recalculated each of the floors based on this dataset (the 2010 dataset minus CISWI units) and made beyond-the-floor determinations based on the recalculated floors. The EPA believes that this approach is properly responsive to the court's remand. See 665 F. 3d at 188 where the court referred favorably to this type of recalculation. For new sources, EPA used the same data as used to establish the 2010 floors—namely the performance of the best controlled similar sources as required by section 112(d)(3).

III. Summary of Final Amendments to Subpart LLL and Subpart F

As discussed in the preamble of the proposed rule, 77 FR 42368, in this final action the EPA is finalizing several amendments to Subpart LLL and Subpart F. These amendments are summarized below.

A. Reconsideration of Standards

As noted above, EPA has responded to the action of the DC Circuit by removing all CISWI cement kilns from the database used to establish the existing source standards, and recalculating existing source floors and standards from that revised database. As described in the preamble of the proposal, the EPA had determined based on the final NHSM rule that there are 24 cement kilns which combust solid waste. 77 FR 42372. During the comment period, one company provided reliable information in its comments regarding the materials it processes indicating that one of these kilns is, in fact, a cement kiln (meaning that the EPA had properly classified it as a cement kiln in the 2010 rulemaking).[1] After reviewing the information provided, the EPA agrees that this source should not be classified as a CISWI kiln and, therefore, should not be removed from the Portland cement kiln database. We received no other comments concerning the identification of cement kilns and CISWI units. There are thus now 23 kilns identified as combusting solid waste and therefore classified as CISWI units. As directed by the Court's decision, we removed these 23 kilns from the database and recalculated the floors. This calculation resulted in the same floors as proposed in the July 2012 proposal.

Consistent with this analysis, the EPA is finalizing amendments to the emission standards as follows:

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[1] The company burns dried biosolids as a fuel which are not classified as solid wastes. Refer to the Docket, No. EPA–HQ–OAR–2011–0817–0482.

1. PM Emission Standards

The EPA is revising several provisions of the emission standards for PM as follows:

- Changing the compliance basis for the PM standards from continuous monitoring with a PM CEMS to a manual three run stack test, amending the level and averaging time of the standard, and requiring a continuous parametric monitoring system using a CPMS. As a consequence, the EPA is also:
- Amending PM standards under the NESHAP for existing sources to 0.07 lb/ton clinker based on manual stack testing, and 0.02 lb/ton clinker for new and reconstructed sources based on manual stack testing;
- Amending PM standards under the NSPS for modified sources to 0.07 lb/ton clinker based on manual stack testing and 0.02 lb/ton clinker for new and reconstructed sources likewise based on manual stack testing;
- Requiring that sources establish a site-specific parametric operating limit for PM, and requiring that the parametric limit be continuously monitored using a PM CPMS;
- Requiring that sources retest once a year to reset the PM CPMS operating limit;
- Adding a provision that, if a source exceeds that site-specific parametric operating limit, it must conduct corrective action including performing a Method 5 or 5I performance test within 45 days; in addition, if the source exceeds that parametric limit four times in a calendar year, the source is presumed to be in violation of the PM emissions standard itself, subject to rebuttal by the source.

2. Mercury Standard

As proposed, the EPA is establishing a standard for mercury of 55 pounds per million (lb/MM) tons clinker for existing sources and is not changing the emission standard (21 lb/MM tons clinker) for new sources. The emission standard for existing sources is the same as the 2010 standard but is a beyond the floor standard.

3. Other Emissions Standards

As the Court requested, the EPA removed the CISWI units from the database and re-calculated the standards for THC and HCl. The standards remain the same as they were in the final 2010 rule. See also 76 FR 21149, 21152, and 21154 explaining why beyond the floor standards for THC and HCl are not justified. The 2010 rules provide an alternative to the THC standard whereby sources can meet a limit for non-dioxin organic HAP by measuring those HAP directly rather than meeting the standard for THC (a surrogate for non-dioxin organic HAP). As proposed, the EPA is changing the level of the alternative non-dioxin organic HAP standard from 9 ppm to 12 ppm. Table 3 summarizes the Final Existing and New Source Standards

TABLE 3—EXISTING AND NEW SOURCE STANDARDS [a]

Pollutant	Existing source standard	New source standard
Mercury	55 lb/MM tons clinker	21 lb/MM tons clinker.
THC	24 ppmvd	24 ppmvd.
PM	0.07 lb/ton clinker (3-run test average)	0.02 lb/ton clinker (3-run test average).
HCl	3 ppmvd	3 ppmvd.
Organic HAP [b]	12 ppmvd	12 ppmvd.

[a] Standards for mercury and THC are based on a 30-day rolling average. The standard for PM is based on a three-run test. If using a CEMS to determine compliance with the HCl standard, the floor is also a 30-day rolling average.

[b] If the source opts to comply with the THC emission limit, this standard does not apply.

B. Continuously Monitored Parameters for Alternative Organic HAP Standard (With THC Monitoring Parameter)

In addition to amending the level of the alternative oHAP standard (i.e., the standard whereby sources meet a standard for oHAP rather than for THC), the EPA is amending the provisions for the site-specific THC operating parameter for that alternative standard (where THC is a site-specific parameter monitored continuously to show compliance with the oHAP standard). The THC operating parameter is established based on THC levels measured during the successful stack test where oHAP are measured directly to demonstrate compliance. As amended, if compliance source testing of oHAP averages a value that is 75 percent or less of the emission limit for oHAP, the facility is allowed to establish a THC parametric operating level corresponding to 75 percent of the oHAP emission limit. We are adopting this provision to avoid penalizing lower-emitting sources by burdening them with the most stringent parametric operating levels. The EPA is adopting a similar provision for continuous PM parametric monitoring, for the same reason (see Section IV.A below). Sources which show oHAP emissions in compliance, but greater than 75 percent of the standard, must establish the average THC concentration measured during the 3-hour organic HAP test and use that as the site-specific THC operating level. Thus, the parametric monitoring level for THC will be the level corresponding to oHAP levels of 75 percent of the standard or the THC level of the oHAP performance test, whichever is higher.[2] Compliance with the oHAP standard will be shown as a ratio of three test runs during mill-on conditions and three test runs during mill-off conditions, with the percentage of operating time spent in each condition determining the ratio. The parametric operating level will be set according to average THC values measured during these same test runs, or to the default value of 75 percent of the standard, as just explained. In addition, the EPA will allow facilities to extend the testing time of the oHAP performance test if they believe extended testing is required to adequately capture THC variability over time. This final rule further requires that the stack test for oHAP be repeated every 30 months to establish a new site-specific THC parameter.

C. Allowing Sources With Dry Caustic Scrubbers To Comply With HCl Standard Using Performance Tests

The 2010 rule allows sources equipped with wet scrubbers to comply with the HCl standard by means of periodic performance tests rather than with continuous monitoring of HCl with a CEMS. Sources electing to comply by means of stack tests must establish continuously monitored parameters including liquid flow rate, pressure, and pH. Under this final rule, kilns with dry scrubbers may also demonstrate

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[2] If a source believes that monitoring non-methane THC rather than total THC is a more reliable indicator of its oHAP emissions, it can submit an alternative monitoring request pursuant to the requirements of 40 CFR 63.8(f).

compliance with the HCl emissions limit by means of an initial and periodic stack test rather than with continuous compliance monitoring with an HCl CEMS. If a kiln equipped with a dry scrubber chooses this alternative, this final rule requires that the sorbent injection rate used during a successful performance test be recorded and then continuously monitored to show that the injection rate remains at or above the rate used during the performance test.

Where either wet or dry scrubbers are used, owners and operators may also establish sulfur dioxide (SO_2) as an operating parameter, rather than, for example, sorbent injection rate, liquid injection rate or pressure drop. If the owner or operator of a scrubber-equipped kiln makes this choice, it must establish the SO_2 operating limit equal to the average of the HCl levels recorded during the HCl performance test, and meet that operating limit on a 30 day rolling average basis. If a source exceeds any established parameter level, it must retest for HCl in order to verify compliance with the HCl emissions standard and must verify or re-establish the parametric monitoring levels as well.

At a minimum, a repeat performance test to confirm compliance with the HCl emissions limit is required every 30 months.

D. Alternative PM Limit

The 2010 final rule established an alternative PM limit to accommodate situations where kilns combine exhaust gas from various operations. 77 FR 42382. The equation establishing the alternative limit contained certain technical errors which the EPA proposed to correct. As proposed, this final rule revises the alternative PM equation so that it includes exhaust gas flows from all sources that would potentially be combined, including exhausts from the kiln, the alkali bypass, the coal mill, and the clinker cooler, for an existing kiln. The EPA is thus finalizing the following equation:

$$PM_{alt} = 0.0060 \times 1.65 \times (Q_k + Q_c + Q_{ab} + Q_{cm})/(7000)$$

Where:

PM_{alt} = The alternative PM emission limit for commingled sources.
0.0060 = The PM exhaust concentration (grains per dry standard cubic feet (gr/dscf)) equivalent to 0.07 lb per ton clinker where clinker cooler and kiln exhaust gas are not combined.
1.65 = The conversion factor of lb feed per lb clinker.
Q_k = The exhaust flow of the kiln (dscf/ton feed).
Q_c = The exhaust flow of the clinker cooler (dscf/ton feed).
Q_{ab} = The exhaust flow of the alkali bypass (dscf/ton feed).
Q_{cm} = The exhaust flow of the coal mill (dscf/ton feed).
7000 = The conversion factor for grains (gr) per lb.

If exhaust gases for any of the sources contained in the equation are not commingled and are exhausted through a separate stack, their value in the equation would be zero. The alternative PM equation for new sources is identical to the existing source equation except the PM exhaust concentration used in the equation is 0.002 gr/dscf, which is equivalent to the new source PM limit of 0.02 lb/ton clinker.

E. Coal Mills

The EPA discussed at length in the preamble to the proposed rule a potential regulatory regime to cover situations where a portion of the kiln exhaust is ducted to the coal mill. See 77 FR 42383–85; see also the regulatory text at 77 FR 42398, 42402–06, 42408–09. To assure that cement kilns do not exhaust untreated HAP through coal mills, and to assure accurate accounting of commingled emissions so that cement kilns are not penalized for commingling emissions where it makes sense to do so, the EPA is finalizing rules applicable to kiln/coal mill emissions for two configurations. In one, a portion of the kiln exhaust is ducted to a coal mill, and then the coal mill exhaust is commingled with remaining kiln exhaust and discharged through the main kiln stack. In the other, a portion of the kiln exhaust is routed through the coal mill and discharged through the coal mill stack.

In the case of a coal mill that receives and discharges a portion of the cement kiln exhaust, this final rule requires that the sum of the mercury, THC and HCl in the kiln exhaust diverted to the coal mill, and the kiln exhaust exhausted from the main kiln stack, must not exceed the subpart LLL emission limits for each respective HAP or HAP surrogate. The facility must document the contribution of the emissions diverted to the coal mill. For mercury, the rule allows tests to be performed downstream of the coal mill to take advantage of any mercury removal that occurs in the coal mill air pollution control device, and to avoid double counting emissions from mercury that becomes re-entrained in the coal. For THC and HCl, the rule allows tests to be performed upstream of the coal mill to avoid any THC or HCl that might be emitted by the coal. For owners and operators who believe that the impact of the testing location (upstream or downstream of the coal mill) would not result in their exceeding the kiln mercury, THC or HCl emissions limits and wish to conduct all their THC, HCl and mercury testing at a single location, this final rule allows testing either upstream or downstream of the coal mill. For sources complying with the alternate organic HAP limit, the facility would not be required to test for THC emissions, but would test for the organic HAP and add that concentration to the remaining emission points to estimate their total emissions for organic HAP.

A cement kiln that commingles emissions from its coal mill with all other kiln exhaust emissions and discharges through a single stack could simply meet the kiln emission limits. In the case of PM, the additional flow from the coal mill would be accounted for in the equation used to determine PM contributions from commingled flows. See section D above. In this configuration, the source would also have the option of monitoring and/or testing kiln exhaust gases prior to the introduction of the coal mill exhaust gas, and testing the kiln gas diverted to the coal mill. In this case this final rule requires that the sum of the mercury, THC (or organic HAP if the source chooses the alternative organic HAP limit), and HCl in the kiln exhaust diverted to the coal mill plus the kiln exhaust measured in the main kiln exhaust must not exceed the subpart LLL emission limits for each respective HAP or HAP surrogate.

The same provisions for coal mills also apply to kilns equipped with an alkali bypass. The one minor exception is that for PM, the summed PM emissions from the kiln and alkali bypass must be equal to or less than the PM limit in subpart LLL. Tests for PM from the alkali bypass must be conducted downstream of the alkali bypass air pollution control devices (APCD) to account for those emission reductions.

With regard to PM, the EPA stated at proposal that where a coal mill receives and discharges a portion of the cement kiln exhaust, the kiln owner operator would have to demonstrate compliance with the 40 CFR 60 subpart Y standard for PM. Although the subpart Y standard is numerically higher than the subpart LLL PM standard, EPA assumed that control would be to the same level because the subpart Y PM standard is predicated on use of fabric filer control technology. 77 FR 42383/2. However, a commenter pointed out accurately that this proposal contravened the basic principle EPA indicated it was adopting here of not allowing diverted kiln emissions to meet a more lenient standard than required by the NESHAP, and further indicated that EPA had failed to show that these diverted PM emissions were controlled as required by section 112(d)(2) and (3) of the Act. EPA agrees with this comment, and accordingly is indicating in the final rule that commingled emissions in this situation would be required to meet the subpart LLL NESHAP for PM. Because coal mill stacks are controlled with fabric filters, we project that they can meet the subpart LLL numeric standard without further controls. See 77 FR 42383. Coal mill stacks will be required to meet annual PM performance testing and combine the measured emissions with PM emissions from the separated alkali stack, bypass stack, and/or main kiln as required in sections 60.62(b)(3), 63.1349 and 63.1350 of this rule.

This final rule also states that sources equipped with an alkali bypass stack or sources that exhaust kiln gases to a coal mill that exhausts through a separate stack are not required to install CEMS on these stacks. Instead of installing a CEMS, such sources may use the results of the initial and subsequent performance test to demonstrate compliance with the PM, THC, HCl and mercury emissions limits. Note that for the main kiln exhaust, the CEMS requirements remain.

We expand on these monitoring provisions below.

1. Mercury

Although mercury from the kiln stack is monitored using a CEMS, mercury emissions from the coal mill are based on a periodic performance test and use of the gas flow rate to the coal mill. Performance tests for mercury must be conducted annually unless and until the tested mercury levels are below the method detection limits for two consecutive years, after which tests may be conducted every 30 months. The performance test results must be summed with the emissions from the kiln stack to determine compliance. The coal mill exhaust mercury emissions are calculated on a mass basis using the measured mercury concentration and the coal mill exhaust gas flow. The coal mill exhaust flow is established using a continuous monitoring system (CMS), or the design maximum flow rate. Mass mercury emissions from the coal mill would be summed with the hourly mercury emissions from the kiln measured by the mercury CEMS. Hourly mercury emissions are then summed to calculate the rolling 30-day mass mercury emissions. This number is then divided by the corresponding 30 days of clinker production to determine the 30-day rolling average. This final rule provides equations for summing emissions from the coal mill with the mercury emissions from the kiln to determine continuous compliance. To see an example calculation, see Section 4 of the Portland Cement Reconsideration Technical Support Document (developed for the proposal), docket item EPA–HQ–OAR–2011–0817–0225.

2. THC and HCl

In this case, site specific kiln stack emission limits (to be continuously monitored) are to be calculated taking into consideration the volumetric exhaust gas flow rates and concentrations of all applicable effluent streams (kiln stack, coal mill and alkali bypass) for the kiln unit. In order to determine the flow rates and concentrations of THC and HCl in the coal mill and alkali bypass streams, the source must test every 30 months using the appropriate test method. For HCl, the performance test must be performed using Method 321 in Appendix A to 40 CFR Part 63. For measurement of THC, Method 25A in Appendix A–7 to 40 CFR Part 60 is required. With these data, the concentration of THC and HCl that must be monitored by the kiln CEMS in order to demonstrate compliance with the kiln MACT limit can be calculated using the equations in this final rule. As with mercury, the coal mill flow rate used to calculate the allowable main kiln stack THC and HCl concentrations can be based on a CMS, or on the maximum design flow rate. The sum of the kiln CEMS and the maximum emissions from the coal mill or alkali bypass must be at or below the subpart LLL limits for THC and HCl. See Section 4 of Portland Cement Reconsideration Technical Support Document (developed for the proposal), docket item EPA–HQ–OAR–2011–0817–0225, for an example calculation.

Also, as a result of these revisions, the EPA is revising the definition of kiln to include inline coal mills and adding a definition of inline coal mill.

F. NESHAP Compliance Date Extension for Existing Sources

This final rule establishes that the compliance date for the amended PM standard, and for the THC, mercury and HCl standards, for existing sources for kilns, clinker coolers and raw material dryers is September 9, 2015. This final rule also establishes February 12, 2014, as the compliance date for the existing open clinker storage pile work practice standards. A detailed discussion of these compliance dates can be found in Section V.D. below.

G. Section 112 Eligibility To Be a New Source

The EPA is not changing the date for new source eligibility under the NESHAP. Thus, a source that commenced construction or reconstruction after May 6, 2009, would remain subject to the section 112 new source standards. A more detailed discussion of this topic can be found below in Section V.E.

H. Other Testing and Monitoring Revisions

In this action we are finalizing the proposed corrections and clarifications to the 2010 rule including changes to: Equations for calculating rolling operating day emissions rates; procedures that include extraneous wording; and cross references and typographical errors in the rule.[3]

For sources that are required to monitor HCl emissions with a CEMS, we are revising the requirements for using HCl CEMS to define the span value for this source category, to include quality assurance measures for data collected under ''mill off'' conditions, and to clarify use of performance specification (PS) 15. This final rule also removes from the standard the oxygen correction factors for raw material dryers and makes minor, non-substantive changes to the sections and paragraphs below:

- Section 60.62(d).
- Section 60.63(b)(1)(i) and (ii), (b)(2), (f)(1), (2), (4), (5), (h)(1) and (6) through (9) (i).
- Section 60.64(b)(2).
- Section 60.66.
- Section 63.1340(b)(1) and (6) through (8).
- Section 63.1346(a) and (c) through (e).
- Section 63.1348(a)(2), (3)(i) through (iii), (a)(4)(i)(A), (a)(4)(ii) and (iv).
- Section 63.1348(b)(1)(i), (iii) and (iv).
- Section 63.1348(b)(3), (5), (6)(i), (8) and (c)(2)(iv).
- Section 63.1349(a), (b)(3), (d)(1) and (d)(2) and (e).
- Section 63.1350(d)(1)(i) and (ii), (f), (f)(2)(i) and (iii), (f)(3), (f)(4), (g)(1) and (2), (k), l(2), (m)(3), (m)(10) and (11), (o) and (p).
- Section 63.1352(b).
- Section 63.1356.
- In addition, we are adding requirements in section 63.1348(a), that

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[3] We note that these changes required the agency to reprint sections of regulatory text. See e.g. 63.1348(a)(3)(i). In reprinting these passages, EPA has not reopened, reconsidered, or otherwise reevaluated the substance of these provisions but rather is only making the needed technical alteration.

a cement kiln that becomes subject to the rule after having been subject to the CISWI regulations, must meet all the initial compliance testing requirements even if they were previously subject to Subpart LLL.

I. Miscellaneous Amendments

We are also finalizing amendments to clarify various requirements in this final rule including issues of applicability, treatment of multiple sources that vent to a single stack, third party certification, definitions and use of bag leak detection systems when PM CPMS are in use.

For raw material, clinker or finished product storage bins, we have clarified that the requirements of this final rule apply only at facilities that are a major source (see section 63.1340(b)(6)) and that affected sources that are subject to subpart OOO (standards for nonmetallic mineral processing) are not subject to the requirements of subpart LLL (see section 63.1340(c)).

With regard to the NSPS, to clarify the recordkeeping and reporting requirement in section 60.65(a) to submit excess emission reports, we have added to section 60.61 of the NSPS a definition of ''excess emissions'' to mean ''with respect to this subpart, results of any required measurements outside the applicable range (e.g., emissions limitations, parametric operating limits) that is permitted by this subpart. The values of measurements will be in the same units and averaging time as the values specified in this subpart for the limitations.'' To clarify what data are used in the calculation of emissions, or used in the calculation of parametric levels that are used to demonstrate continuous compliance, we added to this section a definition of ''operating day'' to mean ''a 24-hour period beginning at 12:00 midnight during which the kiln operates at any time. For calculating rolling 30-day average emissions, an operating day does not include the hours of operation during startup or shutdown.'' The definition for ''operating day'' in section 63.1341 of the NESHAP is revised to be consistent with the above definition. We also became aware that some raw material dryers may be used to dry materials other than kiln feed and we have revised the definition of ''raw material dryer'' in recognition of that fact.

J. Standards During Periods of Startup and Shutdown

In the 2010 final NESHAP, the EPA established separate standards for periods of startup and shutdown which differ from the main standards that apply during steady state operations. In this action, based on comments received and the EPA's reconsideration of several technical issues related to startup and shutdown, the EPA is adopting work practices in place of these numerical standards. The rationale and provisions for the work practice standards are discussed in detail in section IV.C.

The EPA is also clarifying the operating conditions during which these standards apply, including a definition of ''startup'' and ''shutdown''. Under the amended definition, startup begins when the kiln's induced fan is turned on and fuel combustion is occurring in the main burner of the kiln. Startup ends when feed has been continuously fed to the kiln for at least 120 minutes or when the kiln feed rate exceeds 60 percent of the kiln design limitation rate. Shutdown begins when continuous feed to the kiln is halted and ends when continuous kiln rotation ceases.

The startup and shutdown-related changes include:

- Adding a definition of startup and shutdown in section 63.1341, as described;
- Adding section 63.1346(f) describing work practice standards to be met during periods of startup and shutdown;
- Revising section 63.1347 to require that startup and shutdown procedures be included in the facility's operation and maintenance plan;
- Adding section 63.1355(f) requiring records of each startup and shutdown including the date, time and duration and the quantity of feed and fuel added to the kiln during startup and shutdown;
- Adding section 63.1348(b)(9) requiring continuous compliance by operating all air pollution control devices during periods of startup and shutdown.

K. Reporting for Malfunctions and Affirmative Defense for Violation of Emission Standards During Malfunctions

The EPA added to the September 9, 2010, final NESHAP rule an affirmative defense to civil penalties for violations of emissions limits that are caused by malfunctions. Various environmental advocacy groups, as well as the PCA, indicated that there had been insufficient notice of this provision. The EPA agreed and granted reconsideration. See 76 FR 28325 (May 17, 2011). This action finalizes the EPA's decision to retain the affirmative defense on reconsideration.

The EPA is retaining in the final NESHAP rule an affirmative defense to civil penalties for violations of emission standards that are caused by malfunctions. See 40 CFR 63.1341 (defining ''affirmative defense'' to mean, in the context of an enforcement proceeding, a response or defense put forward by a defendant, regarding which the defendant has the burden of proof, and the merits of which are independently and objectively evaluated in a judicial or administrative proceeding). We are also revising some of the regulatory provisions that specify the elements that are necessary to establish this affirmative defense as proposed with minor changes from proposal described later in this section. The source must prove by a preponderance of the evidence that it has met all of the elements set forth in section 63.1344. (See 40 CFR 22.24). The criteria are designed in part to ensure that the affirmative defense is available only where the event that causes a violation of the emission standard meets the narrow definition of malfunction in 40 CFR 63.2 (sudden, infrequent, not reasonably preventable and not caused by poor maintenance or careless operation). For example, to successfully assert the affirmative defense, the source must prove by a preponderance of the evidence that the violation ''[w]as caused by a sudden, infrequent, and unavoidable failure of air pollution control, process equipment, or a process to operate in a normal or usual manner * * *.'' The criteria also are designed to ensure that steps are taken to correct the malfunction, to minimize emissions in accordance with section 63.1344 and to prevent future malfunctions.

Similar to actions taken in several other recent NESHAP amendments (see National Emissions Standards for Hazardous Air Pollutants From Secondary Lead Smelting, 77 FR 556, January 5, 2012, National Emission Standards for Hazardous Air Pollutant Emissions for Shipbuilding and Ship Repair (Surface Coating), and National Emission Standards for Wood Furniture Manufacturing Operations, 76 FR 72050, November 21, 2011), the EPA included an affirmative defense in the 2010 final rule and is retaining it in this rule (see section 63.1344). The affirmative defense provisions give the EPA the flexibility to both ensure that its emission standards are ''continuous'' as required by 42 U.S.C. § 7602(k), and account for unplanned upsets and thus support the reasonableness of the standard as a whole. In addition to the authority cited in support of the affirmative defense in the preamble to the proposed rule, the EPA notes that a recent court decision further supports the EPA's authority to promulgate an affirmative defense. The United States Court of Appeals for the Fifth Circuit recently upheld the EPA's view that an affirmative defense provision is consistent with section 113(e) of the Clean Air Act. *Luminant Generation Co. LLC v. United States EPA,* 2012 U.S. App. LEXIS 21223 (5th Cir. Oct. 12, 2012) (upholding the EPA's approval of affirmative defense provisions in a CAA State Implementation Plan). As discussed in the preamble to the proposed rule (77 FR 42379), the EPA's view is that an affirmative defense to civil penalties for exceedances of applicable emission standards during periods of malfunction appropriately resolves an underlying tension inherent in many types of air regulation, to ensure continuous compliance while simultaneously recognizing that despite the most diligent of efforts, emission limits may be exceeded under circumstances beyond the control of the source. See generally, *Virginia v. Browner,* 80 F.3d 869, 878 (4th Cir. 1996) (the EPA's interpretation that resolved a tension within the CAA is reasonable). The EPA has used its section 301(a)(1) authority to issue regulations necessary to carry out the Act in a manner that appropriately balances these competing concerns.

We are promulgating revisions to the affirmative defense provisions in section 40 CFR 63.1344 as described at proposal (77 FR 42380) and making some minor additional revisions. The phrase ''emission limit'' was changed to ''emission standards'' to reflect that the affirmative defense could be applicable to certain work practice standards. The phrase, ''Off-shift and overtime labor were used, to the extent practicable to make these repairs'' was removed. The term ''notification'' to ''reporting'' was changed to reflect that the root cause analysis required under affirmative defense would be submitted with other periodic reporting. The term ''and monitoring'' was deleted because monitoring malfunctions are defined differently than malfunctions of process and control units and the affirmative defense is intended to apply to malfunctions to affected units that cause a failure to meet an emission standard. The word ''however'' was removed to incorporate more plain language into the regulation. The phrase ''the respondent fails'' was removed and replaced with ''you fail'' to incorporate more plain language into the regulation. The word ''its'' was replaced with ''your'' to incorporate more plain language into the regulation. The phrase ''all of the'' was replaced with ''your'' also to incorporate more plain language into the regulation. The phrase ''air pollution control practice'' was shortened to ''good practices'' to incorporate more plain language into the regulation. In addition, the written report required when asserting an affirmative defense was changed from a separate ''semiannual'' report to a report that is submitted with the first periodic compliance, deviation report or excess emission report due after the event.

We are finalizing the reporting and recordkeeping associated with violations due to malfunctions as described at proposal (77 FR 42388) and making some minor additional revisions as described below.

- Revising section 63.1354(b)(vii) for reporting and recordkeeping violations due to malfunctions. The phrase ''failure to meet a standard'' was used to replace ''deviation'' in the requirement to report violations of the standard. This was changed because the EPA is not finalizing a definition of deviation in this subpart and the term is not defined in the general provisions.
- Revising section 63.1354(c) for reporting a failure to meet a standard due to a malfunction. In addition, the phrase ''failure to meet a standard'' was used to replace ''deviation'' in the requirement to report violations of the standard. This was changed because the EPA is not finalizing a definition of deviation in this subpart and the term is not defined in the general provisions.
- Revising section 63.1355(f) addressing recordkeeping during startup and shutdown. The proposed recordkeeping requirement applicable to startup and shutdown assumed that a numerical emission standard was applicable during startup and shutdown. In finalizing the work practice standards in 63.1346(f) there will no longer be a numerical emission standard applicable during startup and shutdown. As such the recordkeeping requirement must change to reflect the content of the work practice standard. Records must be kept of the date, time and duration of the periods when the work practice is applicable, as well as the fuel and feed data to demonstrate compliance with the work practice standard.

L. What are the compliance dates of the standards?

During the comment period, comments were received that confirmed the need for additional compliance time, since the revised standards can result in different compliance strategies relative to the 2010 final rule. Thus, as proposed, this final rule establishes the compliance date for the amended existing source standards including standards for PM, mercury, HCl and THC to be September 9, 2015. The existing source compliance date for the requirements for open clinker storage piles is February 12, 2014. New sources which commenced construction or reconstruction after May 6, 2009, would remain subject to the new source standards and a compliance date of February 12, 2013, or startup, whichever is later.

M. Open Clinker Storage Piles

The EPA has added work practice requirements for open clinker storage piles that will reduce fugitive dust emissions from these sources. This final rule also contains a definition of open clinker storage piles and requires that a source's operation and maintenance plan include the steps the facility will take to minimize fugitive dust emissions from open clinker storage piles. A detailed discussion of these requirements can be found in section V.C below.

IV. Summary of Major Changes Since Proposal

A. PM Parametric Monitoring

Changes to PM Parametric Monitoring. The EPA proposed the use of PM CPMS for continuous monitoring of PM emissions as a 30-day rolling average established by identifying the average PM CPMS response corresponding to the highest 1-hour PM compliance test. Failure to meet this 30-day rolling average would result in retesting, and more than four exceedances from the parametric limit in a year would be presumed (subject to possibility of rebuttal by the source) to be a violation of the emission standard itself. See 77 FR 42377. Industry commented that this requirement would trigger unnecessary retests for many facilities, especially for the lower-emitting sources. The issue of increased compliance burden falling on the lower emitting sources is legitimate. Sources with especially low PM limits in their performance test would be most at risk of exceeding a parametric limit due to a few emission spikes, even though they would still be operating well under the actual PM compliance limit. We also received comment that the highest PM performance test run may represent, in some circumstances, a number higher than the PM emissions standard. To avoid this eventuality we have changed the final rule to require setting the PM operating limit equivalent to the average of the three PM performance tests, which constitutes the demonstration of compliance with the standard. To avoid penalizing lower emitting facilities, the EPA has modified the way PM CPMS operating limits are established. Sources whose compliance with the PM emission standard are shown to be 75 percent or below the emission limit in the PM method 5 compliance test will set their PM parametric operating limit to be a 30-day rolling average equivalent to that 75 percent level. In a recent rule (76 FR 15736, March 21, 2011), the EPA established 75 percent of the limit as a number that allows for compliance flexibility and is simultaneously protective of the emission standard, and the same technical basis is applicable here as well. Sources whose compliance with the PM emission standard are above 75 percent of the emission limit will establish their operating limit as a 30-day rolling average equal to the average PM CPMS values recorded during the PM compliance test. It should be noted that this provision affects the allowable level of the parametric limit, but does not change the PM emission limit that must be met.

B. Scaling for Continuous Parametric Monitoring of THC for Alternative OHAP Standard

As explained in section III.B above, the EPA is adopting a scaling approach for parametric monitoring of THC under the alternative organic HAP standard which is conceptually similar to the one just discussed for parametric monitoring of PM. This provision affects the allowable level of the THC parametric limit, but does not change the oHAP emission limit that must be met.

The EPA proposed the use of THC monitoring in conjunction with organic HAP compliance testing to determine a parametric operating limit option for monitoring continuous compliance with the alternative organic HAP standard. In the proposed rule the organic HAP parametric operating limit was established by correlating the highest of three organic HAP test results with the corresponding average THC concentration recorded by a parametric THC monitor. Industry commented that this requirement would trigger unnecessary retests for many facilities, especially for the best performing sources. Not wishing to penalize those sources showing good performance, and simultaneously wanting to be protective of the emission standard, the EPA is changing the way parametric THC operating levels are established. Sources whose compliance with the organic HAP emission standard are shown to be below 75 percent of the emission limit will set their operating limit to be a 30-day rolling average equivalent to that 75 percent level. Sources whose compliance with the organic HAP emission standard are at or above 75 percent of the emission limit will establish their operating limit as a 30-day rolling average equal to the average parametric THC values recorded during the organic HAP compliance test. Sources with an in-line kiln/raw mill will use the fraction of time the raw mill is on and the fraction of time that the raw mill is off, and calculate this limit as a weighted average of the THC levels measured during raw mill on and raw mill off testing.

C. Work Practice Standard in Lieu of Numerical Emissions Limits for Periods of Startup and Shutdown

Under section 112(h) of the Act, the EPA may adopt a work practice standard in lieu of a numerical emission standard only if it is ''not feasible in the judgment of the Administrator to prescribe or enforce an emission standard for control of a hazardous air pollutant''. This phrase is defined in the Act to apply to any situation ''in which the Administrator determines that * * * the application of measurement methodology to a particular class of sources is not practicable due to technological and economic limitations.'' CAA section 112(h)(1) and (2). In adopting numerical limits for startup and shutdown in the 2010 final NESHAP, the EPA rejected comments that it should adopt work practices as a standard during startup and shutdown. This was largely because the commenters had not addressed the issue of whether the requirements of section 112(h) had been met. See docket item EPA–HQ–OAR–2002–0051–3464, pp. 183–84. The EPA later denied petitions to reconsider this issue on the grounds that the agency had already provided ample opportunity for comment on the issue, which petitioners had used. See 76 FR at 28323. The DC Circuit dismissed all challenges to the startup and shutdown provisions in the NESHAP (665 F 3d at 189). The EPA granted reconsideration on several technical issues related to startup and shutdown—specifically, monitoring of mercury and PM during startup and shutdown and having an HCl limit of zero for kilns not equipped with CEMS (see 76 FR at 28325), but these issues are no longer relevant based on the approach adopted in this final rule.

In the proposed reconsideration rule, the EPA proposed to retain the numerical standards, but to use recordkeeping rather than measurements to document compliance with the numerical standard. 77 FR 42382–83. EPA further solicited comment ''on whether the numeric standards during startup and shutdown should be amended to provide work practices'', and suggested what potential work practices might be. *Id.* at 42383. Some commenters supported retention of numerical standards, stating that nothing in the record supports a decision by the EPA that numeric standards are not feasible to measure. However, these commenters provided no supporting technical data. We also received comments opposing numeric limits and supporting work practices in their stead. Commenters stated that any numeric limit should be based on actual data gathered during startup and shutdown, which the proposed limits are not, and that measurement of emissions during startup and shutdown poses significant technical problems, mainly based on CEMS calibration issues, and the duration of startups and shutdowns.

Industry has presented information specific to the cement industry to the EPA on technical issues associated with cement kilns measuring PM, mercury, THC and HCl during periods of startup and shutdown. See docket item EPA–HQ–OAR–2011–0817–0237[1] and PCA Meeting 9–15–11 monitoring presentation in the docket for this rulemaking, as well as their public comments. EPA has continued to evaluate these data. In light of all of these public comments and further evaluation of the data, the EPA has decided to establish work practice standards in lieu of numeric standards during startup and shutdown periods. The EPA is doing so because the application of measurement methodology is not practicable for technological and economic reasons. See CAA section 112(h)(2)(B).

The operation of kilns at cement manufacturing plants is different from many other sources. Kiln startups can last days, during which time fuels are switched and temperatures and moisture conditions fluctuate substantially. Also, cement kilns have two types of inputs—raw feed that is changed into clinker in the kiln, and kiln fuel. The cement kiln is sized to accommodate not just exhaust gas flow from combustion, but the gases evolved from the calcination of limestone and moisture that evaporates from the kiln feed. As a result of these factors, the difference in gas flow characteristics of a cement kiln during steady state operation and startup/shutdown is more pronounced than that for other combustion source categories. In addition, cement kilns begin introducing feed as part of the startup process which further exacerbates the transient and fluctuating nature of these operations not only because of the impact of this feed on the exhaust gases, but because raw materials and fuels are introduced at opposite ends of the kiln, which results in countercurrent flow of the solid material in the kiln and kiln exhaust gas, increasing the turbulence, transience and fluctuating conditions. The result is that conditions change constantly when cement kilns are in startup or shutdown mode. These conditions make stack measurements, both manual and continuous, for this source category unreliable because the constant shifting in conditions prevents any stack measurement from being representative of anything but conditions at that precise moment. For that reason manual stack tests, which take place over a period of a few hours, would not be presenting accurate information, since they would not be reliably measuring conditions across the duration of the test.

There is no way to craft a testing regime to compensate for these testing issues at each kiln in a manner that can produce reliable and replicable results. Such modifications would be specific to that individual startup event—i.e. *ad hoc* and therefore not of general applicability or utility in showing compliance. Continuous measurements conducted during these periods for cement kilns are also subject to inaccuracies resulting from these rapidly changing conditions. The temperature changes of greater than one thousand degrees Fahrenheit, flue gas moisture changes greater than 20 percent, and gas flow changes over several thousand cubic feet per minute, as well as other factors such as flue gas molecular weight swings, combine to create a complex matrix of measurement variables not accounted for in a cement kiln CEMS installation. That is, CEMS for PM, HCl, Hg, and THC are not able to reliably accommodate all of these transient shifting variables when measuring cement kiln startup and shutdown emissions. As noted above, these issues are further exacerbated by the fact that cement kilns have multiple inputs (fuel and feed), and the clinker production process generates higher gas flows than would be expected based on just the fuel inputs. This fact also means that flue gas flow rates cannot be accurately calculated from fuel inputs alone.

The EPA regards situations where a measurement may yield a value which is analytically suspect, which is the case for cement kilns during startup and shutdown for the reasons just described, as being a situation where measurement is not ‘‘technologically practicable’’ within the meaning of section 112(h)(2)(B) of the Act. Unreliable measurements raise issues of practicability and of feasibility and enforceability (see section 112(h)(1)).[4]

The EPA is not finalizing its proposed approach of setting numerical emission limits for startup and shutdown and requiring that sources certify compliance with those limits by keeping certain records certifying that they used certain fuels and did not introduce feed into the kiln. Under the proposal, sources would have had to certify compliance with the standards for the various organics based on assumed combustion conditions. As pointed out persuasively in the public comments, combustion conditions during startup and shutdown are too widely varying to either reliably measure or calculate emissions because combustion conditions change widely during startup and shutdown, sources indicated that they could not certify compliance based on an assumed combustion condition. See docket item EPA–HQ–OAR–2011–0817–0506, p. 11 (‘‘Until ideal combustion conditions can be met in the combustion chamber (adequate temperature and turbulence), the combustion process will be incomplete. While this should not impact fuel-derived hazardous air pollutants (chlorine and mercury), it will impact the emissions of organics and possibly PM’’). In light of the measurement issues noted above and the fact that sources could not certify compliance under the proposed approach, the EPA is not finalizing the proposed approach of setting numerical limits for startup and shutdown and allowing sources to certify compliance with the limits by maintaining certain records.

Instead, for the reasons explained above, the EPA is establishing work practice standards to demonstrate compliance with startup and shutdown. The work practices that apply during startup and shutdown are as follows:

- During startup the kiln must initially use any one or combination of the following clean fuels: Natural gas, synthetic natural gas, propane, distillate oil, synthesis gas, and ultra-low sulfur diesel until the kiln reaches a temperature of 1200 degrees Fahrenheit.
- Combustion of the primary kiln fuel may commence once the kiln temperature reaches 1200 degrees Fahrenheit.
- All air pollution control devices must be turned on and operating prior to combusting any fuel.
- You must keep records as specified in § 63.1355 during periods of startup and shutdown.

For the purpose of identifying when the kiln is in a startup/shutdown mode and subject to work practices and when the kiln is subject to numerical emission limits, we are defining the beginning and ending of startup and shutdown. At proposal we defined startup as when the kiln's induced fan is turned on and shutdown was defined as beginning when feed to the kiln is halted. Commenters noted that a kiln may have the induced draft (ID) fan operating even when the kiln is completely shutdown, no fuel is being burned, and there is no potential for emissions. Therefore, we changed the startup definition to be when a shutdown kiln turns on the ID fan and begins firing fuel in the main burner, because this is the point where the potential for emissions to occur begins. Startup ends when feed is being continuously introduced into the kiln for at least 120 minutes or until the feed rate exceeds 60 percent of the kiln design limitation rate. We added the duration/load element to the definition of startup because during startup a kiln must begin adding feed material to achieve steady state operation. After feed is first introduced it requires up to two hours or sufficient feed to achieve 60 percent of maximum operation to achieve a representative steady-state condition. (See meeting notes, PCA November 28, 2012, in the docket for this rulemaking). Shutdown begins when continuous feed to the kiln is halted and ends when the kiln rotation ceases.

We believe these work practices, which include the requirement that all air pollution control devices be operating, will ensure that emissions during startup and shutdown will be lower than the standards that apply during steady state operations, given use of cleaner fuels, minimal raw material inputs, and operation of all control devices during these periods. See 77 FR 42382 (noting that emissions during startup and shutdown would be expected to be lower than during steady state operations for these reasons).

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[4] The application of measurement methodology during cement kiln startup and shutdown would also not be ‘‘practicable due to * * * economic limitation’’ within the meaning of section 112(h)(2)(B) since it would just result in cost expended to produce analytically suspect measurements.

V. Summary of Significant Comments and Responses

A. Amendments to Existing Source and New Source Standards for PM Under CAA Sections 112(d) and 111(b)

1. Changes to Level and Averaging Time of Existing Source NESHAP

The EPA proposed to amend the existing and new source standards for PM. The floor for the existing source standards increased from 0.04 lb/ton clinker to 0.05 lb/ton clinker as a result of removing CISWI kilns from the database. See Section 8.3, Portland Cement Reconsideration Technical Support Document, June 15, 2012, Docket item EPA–HQ–OAR–2011–0817–0225; see also 77 FR 42372/3. Second, the EPA proposed to change the compliance regime for the standard from use of PM CEMS to stack testing, a consequence being that the standard would no longer be expressed as a 30-day average but rather as the average of three test runs. The EPA thus proposed to express the recalculated floor (i.e. 0.05 lb/ton clinker 30-day average resulting from the reanalysis) as .07 lb/ton of clinker (average of three test runs). The 0.07 lb/ton clinker standard expresses the recalculated floor (i.e. 0.05 lb/ton clinker) as a not-to-exceed value based on stack testing, using the Upper Prediction Limit equation to do so. See Portland Cement Reconsideration Technical Support Document, June 15, 2012, Docket item EPA–HQ–OAR–2011–0817–0225.[5]

The EPA further proposed to use CPMS for continuous parametric monitoring. This system responds to changes in PM concentration and generates a corresponding milliamp output signal. 77 FR 42376–77. The proposed PM parametric level was correlated to the highest recorded value during three test runs. A source would meet this site-specific level on a 30-day rolling average. Failure to meet this 30-day rolling average would result in retesting, and more than four deviations from the parametric level in a year would be presumed (subject to possibility of rebuttal by the source) to be a violation of the emission standard itself. See 77 FR 42377.

Our proposal to change the compliance regime from use of CEMS to stack tests reflected technical issues related to a PM CEMS' reliability with measuring the Portland cement PM standard. Specifically, the EPA discussed the reliability of measurements, obtained using PM CEMS calibrated as required by the mandated PS 11, below the level of the 2010 standard or the level of the recalculated PM floor. See 77 FR 42374–76. The EPA's judgment at proposal was that as a result of PM measurement uncertainties, ''this correlation will not be technically or practically achievable for a significant number of cement kiln sources.'' *Id.* at 42376.

One commenter challenged the necessity of amending the standard to a stack test regime (apparently not realizing that the existing source standard also changed as a result of removing CISWI kilns from the database). First, the commenter maintained that the EPA has no authority to voluntarily change a promulgated MACT standard to make the standard less stringent, based on the language of section 112(d)(7). The commenter further maintained that the EPA had not definitively shown that PM CEMS calibrated pursuant to PS 11 could not be used to reliably measure the Portland cement PM standard. Specifically, the commenter stated that the various problems identified by the EPA at proposal are amenable to resolution by testing longer and more often, and argued that the EPA essentially admitted as much at proposal. The commenter noted that other technical problems, like the difficulty of accounting for varied particle sizes, could be resolved by using a beta gauge CEMS. The commenter dismissed the EPA's technical reservations on these issues as arbitrary speculation. The commenter also stated that PM CEMS are already in successful use by cement plants both in this country and overseas. The commenter further believed that the EPA could resolve these technical issues by amending the PM CEMS Performance Specification rather than by amending the averaging time of the PM standard and changing its compliance basis.

In response, we note first that we do not accept the commenter's legal argument based on section 112(d)(7). Section 112(d)(7) states that ''[n]o other emission standard * * * under this section shall be interpreted, construed or applied to diminish or replace the requirements of a more stringent emission limitation or other applicable requirement established pursuant to section 111 of this title, part C or D of this subchapter, or other authority of this chapter or a standard issued under State authority.'' Although the commenter maintained that this provision unambiguously bars the EPA from amending the promulgated NESHAP to make it less stringent, we disagree. Indeed, it is hard to read the statutory language in such a way. On its face, the provision indicates that a section 112(d) standard does not supplant more stringent standards issued under some authority other than section 112(d). Nor does the commenter's interpretation make sense. It would bar the EPA from amending a section 112(d) standard that was technically deficient or incorrect. This cannot have been Congress' intent when adopting the technology-based section 112(d) MACT regime.[6] Moreover, when Congress adopted anti-backsliding provisions in the CAA, it did so explicitly. See CAA sections 172(e); 110(l); and 193. There is no such explicit language in section 112(d)(7). Thus, the EPA does not read section 112(d)(7) as precluding amendments to MACT standards which result in numerically less stringent standards, provided of course, that such standards are technically justified and otherwise consistent with the requirements of the Act.

The commenter is also mistaken in asserting that sources can simply utilize PM CEMS not correlated to PS 11. The PS 11 requirements apply to all PM CEMS used by a cement kiln. See sections 63.1349(b)(1)(A) and 1350 (b)(1) from the 2010 final rule (75 FR 55057, 55059).[7]

With regard to the technical issues raised by this commenter, the EPA explained in detail at proposal the problems of correlating PM CEMS under PS 11 at cement plants (see 77 FR 42374–42377). These obstacles are not resolvable simply by measuring more often and longer, as the commenter maintains. Extending the duration of the Method 5 test gives this reference method additional opportunity to collect more sample mass, but this is no guarantee that the time added to the test will collect enough particulate mass to resolve detection issues, especially when testing is conducted at the better performing (lower emitting) sources. Longer test runs inherently increase the variability of the PM CEMS data collected during the test, which may cause further difficulties with the

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[5] One commenter inaccurately stated that the proposed rule would essentially double the PM standard. As just explained, the existing source floor (and standard) increased from 0.04 30-day average to 0.05 lb/ton clinker 30-day average as a result of removing CISWI kilns. As a not-to-exceed standard, that same level is expressed as 0.07 lb/ton clinker, the higher level reflecting the greater variability involved when basing the standard on the average of the three test runs rather than on 30 days of measurements.

[6] The commenter cites no legislative history to support its reading, nor is EPA aware of any.

[7] It also makes no sense to use PM CEMS not subject to a uniform calibration protocol. The results obtained would not be comparable.

correlation between instrument and reference method. Nor does conducting a higher number of reference method tests resolve the difficulties with PS 11 correlation created by greater uncertainty in the reference method at low levels. Put another way, more tests with high uncertainty and poor correlation do not improve the likelihood of passing PS 11 as there is no expectation of improving the mathematical relationship between the reference test and the instrument. Furthermore, PS 11 section 8.6 requires a minimum number of fifteen tests to develop a correlation curve, with no limit to the maximum number. Considering more than 15 tests when developing the correlation creates much difficulty in developing a precise mathematical relationship. Sources are allowed to discard 5 runs for any reason they wish, but must present at least 15 test runs for the correlation calculation. *Id.* As a source increases the number of test runs beyond 20, any additional runs must be included in the correlation equation and at that point the ability of a source to satisfy PS 11 becomes more hampered with every test run.

The EPA noted that special problems are posed by the size and variability of cement kiln-generated particulate. The EPA also noted that the standard light-scintillation type of PM CEMS would likely encounter higher variability for the same PM concentration, and have difficulty satisfying correlation protocols as a result. The EPA noted that beta gauge CEMS could potentially resolve at least some issues related to cement particle variability but noted further that these devices were largely untested in the cement industry, and none (so far as the EPA is aware) has successfully completed a PS 11 certification. See 77 FR 42375/3. The commenter maintains that the existence of beta gauge CEMS resolves all questions as to their reliability in the cement industry, but the EPA reiterates, as it did at proposal, that there needs to be some assurance of the reliability of that methodology to certify with PS 11 at low levels (as required by this final rule). That information does not presently exist. The commenter states that the EPA is being speculative as to potential difficulties with a different CEMS technology, but relative to Portland cement sources, it would be speculative to assume that beta gauge CEMS would successfully pass a PS 11 certification to reliably and quantifiably measure compliance with the NESHAP, especially at the very low PM levels at some of the sources in the cement source category.

The commenter also maintains that Tapered Element Oscillating Microbalance (TEOM) devices could be used in place of light scintillation PM CEMS. A TEOM is a device that uses a very thin, tapered, element vibrating at a known frequency that has a first principle relationship to the measurement of mass. Particles that impact the element also impact the harmonic vibration of the sensor which can be translated to a measurement of the particle mass. This is a more direct approach to measuring the actual mass of PM in stack gas, and has shown promise to operate very consistently at low levels in laboratory conditions. Several TEOMs are currently used for monitoring ambient PM levels at several non-cement, non-domestic industry installations. TEOMs that are capable of measuring stack gas are not currently available for sale in the U.S., though this may change in future years. Even so, with a monitor capable of more direct mass measurement of PM in stack gas, using PS 11 to certify one against Method 5 may be problematic at low PM concentrations. The EPA currently has no data to assess TEOM capabilities versus Method 5 at very low PM concentrations such as those presented by the better performing sources in this category. Were TEOM instrumentation commercially available, the EPA would need to conduct a re-evaluation of PM CEMS technology that included TEOM data to determine if this instrument could overcome the challenges posed by calibration with Method 5 at the very low PM levels emitted by some of the sources in the cement source category. As just explained, it is not speculation, but rather legitimate engineering caution that makes it appropriate not to require compliance with a rule based on an untested measurement methodology.

The commenter further maintains that rather than amend the standard to change the compliance test methodology and averaging time, the EPA should revise PS 11 instead, evidently assuming that a revision can be done rapidly. The commenter's assumption is mistaken. Performance specification development is a process that takes multiple years and involves data collection on types of technologies, field testing, comparison to reference measurement methodology, workgroup and stakeholder meetings, peer review, rule proposal and public comment period, as well as comment response and final promulgation of the Performance Specification. With the development of PA 12A for Mercury CEMS, the EPA invested a budget in excess of one million dollars to conduct technology and field studies, as well as to refine the analytical techniques and work through stakeholder concerns prior to proposal of the Performance Specification. The process from inception to final promulgation took over 5 years to complete. PS 11, at issue here, was over 3 years in development, from concept to final promulgation, and involved a budget of $250,000. Based on this past history, it is likely to result in a delay of 3 years or more were the EPA to delay promulgation of this final rule until we could undertake the process to research, propose and finalize solutions to PS 11 that may ameliorate some of the issues vis-a-vis the cement industry now present. Furthermore, such a process would not address the issues relating to measurement uncertainties using Method 5 at low PM concentration levels near its detection limit (i.e. below its practical quantitation limit of 3 mg), and so there would remain significant technological hurdles to clear before the EPA could require the use of PM CEMS in respect to this final rule.

The commenter points to PM CEMS use by European cement kilns. This is a misplaced comparison. The European calibration and certification of this instrumentation is completely different than PS 11 requirements developed by the EPA. European monitoring is certified in a laboratory environment, and calibrated on site by the instrument vendor when installed. The EPA has a long history of requiring CEMS installations in the USA to meet more rigorous calibration and performance specification certification through a series of comparisons to reference Method 5 test measurements conducted on the stack with the flue gas matrix at the facility, not in a controlled laboratory. For a PM CEMS, this would be a correlation developed with Method 5 as described in PS 11. The two certification regimes differ greatly in approach and simply adapting European certification standards to USA facilities does nothing to mitigate this difference.

In summary, the EPA has carefully considered the issue and it is our engineering judgment that the PS 11 correlation will not be technically or practically achievable for a significant number of cement kiln sources. This is due to the combination of the low emissions concentrations, PM CEMS measurement uncertainty factors, the variability in composition of cement PM, and need for extraordinarily long test runs to reduce Method 5 uncertainty to a level that provides normal measurement confidence (i.e. greater than the 3 mg practical quantitation level of Method 5), plus the compounding uncertainties associated with source operational variability. The EPA further recognizes that these problems in developing PS 11 correlations are most likely to adversely affect the lowest emitting sources in the category and are more likely to result in violations of the rule more often for these sources than for sources operating with higher PM emissions. This result would obviously be environmentally counterproductive. We are therefore amending the standard to be based on stack testing, and expressing the standard as a not-to-exceed (i.e., stack test Method 5 or 5I) standard of 0.07 lb/ton clinker.[8]

Additional responses regarding these issues, including responses to issues raised in the comments from industry, are found in sections 3 and 4 of the Response to Comment document, which is found in the docket for this rulemaking.

2. Issues Related to Use of CPMS for Parametric Monitoring

To document continuous compliance with the Method 5 standard (i.e., parametric monitoring designed to monitor proper operation of PM controls), the EPA proposed that PM be monitored continuously using a CPMS. See 77 FR 42376–77. The parametric limit was to reflect the highest of the three method 5 test runs from the stack test, and would be averaged over 30-days. The EPA further proposed corrective action requirements in the event of exceeding the 30-day rolling average parametric limit, and a rebuttable presumption that four such exceedances in a calendar year showed a violation of the emission standard itself.

With respect to the use of CPMS technology, the EPA has recognized that PM CEMS technology cannot meet PS 11 requirements in all Portland cement installations, yet the EPA has also recognized that PM CEMS sensors are more sensitive and better at detecting small differences in PM concentration than other technologies such as opacity monitors (*http://www.epa.gov/ttn/emc/cem/pmcemsknowfinalrep.pdf*) In considering the use of PM CEMS at Portland cement facilities we find that while using PM CEMS technology for continuous quantitative measurement of PM concentration as correlated to Method 5 with PS 11 is frequently not achievable (as stated in the preceding subsection of this preamble), using the same technology for continuous qualitative measurement of PM emissions is practicable in every instance. Given the information we have that shows PM CEMS technology to be more sensitive to in-stack PM concentration differences than opacity monitors and nepheolmeters, the EPA sees a distinct advantage in using these technologies for continuous parametric PM monitoring, rather than measuring some other parameter.

In using a PM CEMS as a CPMS to conduct continuous qualitative monitoring of PM concentration in the stack, we are not interested in specific output information from the instrument (e.g. lbs/ton clinker). We only need to know that PM concentration increases or decreases. The signal output from the instrument need not be correlated to PM concentration through PS 11 trials to achieve this, but rather we can accept the native signal output from the instrument, as is, in milliamps, and track that signal to determine trends in PM emissions. In this final rule we are requiring PM CPMS instruments to employ a 4–20 milliamp output, which is a standard electronic signal output common to many CEMS.[9] With a PM CPMS the milliamp output would not represent an opacity value, but like an opacity analyzer, the milliamps would increase as PM concentration increases and decrease as PM concentration decreases. We can then monitor the milliamp signal while conducting a Method 5 performance test and correlate the average milliamp signal to the average PM concentration during the testing. This relationship is notably coarser in terms of understanding the precise PM concentration in the stack, but the instrument's sensitivity to changing PM concentration in the stack, and its changing milliamp signal output, does not deteriorate and may still be employed to qualitatively monitor PM emissions.

The EPA received numerous comments about our proposed PM CPMS parametric monitoring approach. Industry commenters maintained that sources would have to continually retest unnecessarily, since CPMS measure an increase in PM CPMS values. This increase in PM CPMS values would (or at least, could) denote a modest rise in PM emissions, but actual stack emissions of PM could still be well below the limit. The EPA recognizes this concern as creating additional burden for facilities exhibiting good control of their PM emissions (see section IV.A above), and, therefore, we have modified the process by which a source would establish and comply with their PM CPMS operating limit in this final rule. In doing so we considered scaling options for PM CPMS signals, as they correspond with PM emissions, that were proposed by industry but found the options presented were not protective enough of the emission standard. After extensive analysis (see S. Johnson, memo to docket number EPA–HQ–OAR–2011–0817, ''Establishing an Operating Limit for PM CPMS'', November 2012), we are promulgating a scaling factor of 75 percent of the emission limit as a benchmark. See section IV.A above. As in the proposed rule, every source will need to conduct an annual Method 5 test to determine compliance with the PM emissions limit, and during this testing will also monitor their PM CPMS milliamp output. Sources which emit PM less than 75 percent of their emission limit will be able to scale their PM CPMS milliamp output to determine where their PM CPMS would intersect 75 percent of their allowed PM emissions, and set their operating level at that milliamp output. This alleviates many re-testing concerns for sources that operate well below the emission limit and provides them with greater operational flexibility while still assuring continuous compliance with the PM stack emission standard. It also creates an incentive for sources to select high efficiency PM controls when sources are evaluating potential compliance strategies.

For sources whose Method 5 compliance tests place them at or above 75 percent of the emission standard, their operating level will be the average PM CPMS milliamp output during the three Method 5 test runs. This means their operating level is the milliamp output that correlates to their PM compliance determination, and not the highest average 1 hour run value that was in the proposed rule. Now that we are adopting a scaling factor, we no longer believe that it is also appropriate to establish the parametric limit based on the highest of the three runs (which moreover, could reflect a level higher than the level of the standard). Moreover, as noted below, we believe that on balance the 30 days of averaged

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[8] Because the EPA believes that these same issues pertain to measurements of the section 111(b) new source performance standard for modified sources, and because further controls would be both costly and not cost effective (see section V.A.3 below), the EPA is adopting the same amendment for modified new sources under the NSPS.

[9] For example, an opacity instrument uses a series of filters to calibrate the analyzer and produce a ''percent opacity'' output. Twenty five percent opacity likely correlates to a milliamp value near eight milliamps, or 4 milliamps plus 25 percent of the difference between 4 and 20 milliamps (again, 4 milliamps). Fifty percent opacity would represent a signal near 12 milliamps, and so on, with 20 milliamps representing a signal of 100 percent opacity.

CPMS measurements provides ample operating cushion.

In a recent rule (76 FR 15736, March 21, 2011), the EPA established 75 percent of the limit as a number that allows for compliance flexibility and is simultaneously protective of the emission standard. In this final rule we are utilizing that value so as not to impose unintended and costly retest requirements for the lowest emitting sources and to provide for more cost effective, continuous, PM parametric monitoring across the Portland cement sector. This approach was selected from among many considered as it provides the greatest amount of flexibility while demonstrating continuous compliance for sources which are the lower emitters in the category and is also effective in holding higher emitters to the emission standard. With this parametric monitoring approach in place we expect sources to evaluate control options that provide excellent PM emissions control and provide them greater operational flexibility below the standard.

One commenter maintained that the use of a CPMS for parametric monitoring would be ''egregious'' since the milliamp output of the CPMS allowed a source to select operational parameters of tangential relation to PM emissions and would therefore not provide useful information as to proper PM control. The commenter also stated that monitoring of opacity would be preferable. An industry commenter likewise requested that continuous opacity monitors or bag leak detectors be used rather than CPMS.

The EPA does not agree with these comments. First, the milliamp output of the CPMS reliably and sensitively indicates increasing or decreasing PM concentration in the stack. Where PM controls are failing, the PM CPMS signal will indicate the increasing concentration of PM in the stack. A source will need to monitor the trend from the PM CPMS daily reading to maintain compliance with the 30-day emission standard. Indeed, the EPA has sufficient confidence that four exceedances of the CPMS continuous measurements is a presumptive violation of the emission standard itself. Moreover, the CPMS is considerably more sensitive than an opacity monitor or bag leak detector at detecting fluctuations in PM level. An opacity monitor determines the percent of a light signal that is occluded across the stack diameter. Opacity analyzers operate on a zero to 100 percent scale, meaning they are capable of registering PM that completely occludes the far stack wall from the instrument light source. This amount of PM is roughly equivalent to a complete failure of the emission control device. A properly operating control device will emit five percent opacity or less, which is barely visible to the naked eye and on the low end of the opacity monitor capability. PM emissions that increase opacity two percent at this level may well exceed the emission standard, yet they only mildly deflect the opacity monitor output. This same 2 percent opacity increase is capable of registering changes of several milliamps on a PM CPMS when operating on the scale provided in this final rule. With several decimal fractions available between each milliamp to track signal output, and three or four milliamps representing 1 percent opacity, the PM CPMS has a clear advantage in low PM concentration measurement over continuous opacity monitoring systems. Regarding baghouse leak detectors, the EPA has no information that shows them operating on the same sensitivity level as PM CPMS technology, and we do not require baghouse leak detection systems on sources where PM CPMS are in use for this reason.

Industry commenters objected to the proposal that 4 calendar year exceedances[10] from the parametric limit would be a presumptive violation of the emission standard. Again, the EPA does not agree. First, the EPA may permissibly establish such a presumption by rule, assuming there is a reasonable factual basis to do so. See *Hazardous Waste Treatment Council* v. *EPA,* 886 F. 2d 355, 367–68 (DC Cir. 1989) explaining that such presumptions can legitimately establish the elements of the agency's *prima facie* case in an enforcement action. Second, there is a reasonable basis here for the presumption that four exceedances (i.e. increases over the parametric operating limit) in a calendar year are a violation of the emission standard. The parametric monitoring limit is established as a 30-day average of the averaged test value in the performance test, or the 75th percentile value if that is higher. In either instance, the 30-day averaging feature provides significant leeway to the owner operator not to deviate from the parametric operating level since the 30 measurements will significantly dampen variability in the single measurement (average of three test runs) that produced the parametric value. See 77 FR 42377/2 and sources there cited. The EPA acknowledges that the difference was even greater between the parametric level and the emission standard in the proposed rule (which was based on the highest measured test run). The EPA believes that the 30-day averaging feature plus the 75-percent scaling feature for the lower emitting sources now provides a sufficient operating cushion. See 77 FR 42377.

3. Existing Source Beyond the Floor Determination

The EPA proposed to use the floor levels for PM as the standard, rejecting more stringent standards on the grounds of poor cost effectiveness (after considering non-air environmental impacts and energy implications of a more stringent standard as well). See 77 FR 42376. One commenter argued that the EPA should adopt a beyond the floor standard for PM, maintaining that such a standard was justified under the factors set out in section 112 (d)(2).

The EPA disagrees, and is not adopting a beyond the floor standard. After considering the cost of the emission reductions attributable to such a standard, and the associated non-air and energy impacts of such a standard, the EPA determines that the standard is not ''achievable'' within the meaning of section 112 (d)(2). Specifically, the EPA estimates that a beyond the floor standard set at the level of the original (2010 final rule) standard would only result in 138 tpy—nationwide—of PM reduction (a value not questioned by any of the commenters). See Final Portland Cement Reconsideration Technical Support Document, December 20, 2012. We further estimate that the cost of achieving this modest incremental reduction would be approximately $37 million (the estimated cost savings attributable to the amended PM standard (including savings attributable to ancillary PM controls related to collection of PM from the control of Hg, THC, and HCl). See Final Portland Cement Reconsideration Technical Support Document, December 20, 2012, included in the rule docket, EPA–HQ–OAR–2011–0817. These total costs are high compared to the small nationwide emission reductions, and the cost effectiveness of these reductions is correspondingly high: approximately $268,000 per ton of PM removed. This is significantly higher cost effectiveness for PM than the EPA has accepted in other NESHAP

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[10] In the proposed rule, the EPA referred to a measurement higher than the parametric limit as a ''deviation'' and proposed a definition of deviation. See 77 FR 42398. The EPA is not including this terminology in this final rule. The term ''deviation'' is not in the Portland cement NESHAP rules (which date back to 1998), and has not proved necessary in practice. More important, the rule itself states what the consequences of measurements which exceed a parametric limit are (i.e. retesting, and in some instances, a presumptive violation of the emission standard itself), so that no further general regulatory provision (i.e. a generalized definition of 'deviation' or similar term) is necessary.

standards. See 76 FR 15704 (March 21, 2011) (rejecting $48,501 per ton of PM as not cost effective for PM emitted by CISWI energy recovery units); see also 72 FR 53814, 53826 (Sept. 20, 2007) (proposing (and later accepting) cost effectiveness of $10,000 per ton for PM as reasonable in determining Generally Available Control Technology, and noting that the EPA had viewed cost effectiveness only as high as approximately $31,000 per ton as reasonable under its Title II program for mobile sources). A beyond the floor standard at the level of the 2010 standard would also involve slightly higher energy use, although this is not a major factor in EPA's decision. EPA is therefore not adopting a beyond the floor standard for PM at the level of the 2010 standard. A standard even more stringent would likewise not be justified. See 76 FR 54988.[11]

4. New Source PM Standard Under Section 112(d)(3)

One commenter challenged the methodology the EPA used in the 2010 rulemaking to establish the new source floor and standard, maintaining that for new plants, the EPA's floors must reflect the emission level achieved by the single best performing kiln in the category, not the best performing kiln for which the EPA happens to have emissions information. See section 112(d)(3). The EPA did not reopen the methodology by which new source floors for this industry are determined. See 77 FR 42373 n. 3 (''The EPA will not consider comments challenging the data and methodology for the new source standards since these are unchanged from the 2010 rule and the EPA is not reexamining any of these issues.'') In any case, if the issue is (against the EPA's view) deemed to be reopened, CAA section 112(d)(3) indicates that new source floors are to be based on ''the emission control that is achieved in practice by the best controlled similar source, *as determined by the Administrator''* (emphasis supplied). This language affords considerable discretion for the agency to base the NESHAP new source floors on performance of sources for which the agency has emissions information.

B. Mercury Standard

The EPA explained at proposal that reanalysis of the mercury floor, after removing CISWI kilns, resulted in a floor of 58 lb/MM tons clinker produced—slightly higher than the previously calculated floor and standard of 55 lb/MM tons clinker produced. The EPA further proposed to adopt 55 lb/MM tons clinker produced as a beyond-the-floor standard. See 77 FR 42373. The new source standard was unchanged since the standard was based on the performance of the best performing similar source.

The EPA is adopting the standards as proposed. One commenter challenged the appropriateness of adopting a beyond-the-floor standard, not for the industry as a whole, but for itself. As to this individual plant (Ash Grove, Durkee), the commenter maintained that the cost of attaining the three additional lb/MM ton clinker produced reduction (i.e., the difference between 58 and 55 lb/MM tons clinker produced) was greater than the EPA estimated because it would require more than just additional carbon in an activated carbon injection system to achieve the incremental difference. According to the commenter, they have performed extensive testing and the addition of activated carbon per million actual cubic feet per minute of exhaust gas has little or no impact on mercury emissions. The commenter states that for plants such as Ash Grove's Durkee plant, there is no known add-on control technology at this time that will assure achievement of the standard on a continuous basis.

We note first that the commenter is somewhat over-estimating the incremental reduction of mercury actually needed. To achieve the emission standard, sources will need to operate their processes and controls so that they can achieve the average emissions level used in setting the existing source limit of 55 lb/MM ton—the so-called design level. See e.g. 77 FR 42389/3 (estimating emissions attributable to this final rule based on design levels); see also discussion of design values in section VI.B below. That level is 31.7 lb/MM ton for the standard of 55 lb/MM ton. See 75 FR 54976/3. The average for the 58 lb/MM ton is 34.1 lb/MM ton. The additional reduction needed is therefore 2.4 lb/MM tons, not 3 lb/MM tons as stated by the commenter.

As the EPA has acknowledged repeatedly, due to the high levels of mercury in their limestone, mercury emissions from the Ash Grove Durkee plant are not typical of other plants in the industry. See, e.g. 75 FR 54978–79. As a result, this plant faces a particularly great challenge in meeting the mercury standard, whether the standard is 55 or 58 lb/MM tons. Because of their unique situation, we do not believe that the difficulties this facility is having in meeting the mercury standards can be generalized to the rest of the industry. Section 112(d)(2) of the Act posits an industry-wide standard. Having said this, our cost analysis conducted for the 2009 proposal and 2010 final rule assumed that this plant would have to install multiple control systems in order to meet the limit for mercury. See Docket item EPA–HQ–OAR–2002–0051–3438. Therefore, if in this particular case the activated carbon injection (ACI) system cannot achieve the small additional reductions required, then the facility has other mercury control options available such as further dust shuttling, or treating cement kiln dust to remove mercury. Dust shuttling entails moving dust from within the kiln to other parts of the process and is considered a closed loop process, thereby not causing any waste impacts. In addition, any costs associated with dust shuttling have already been accounted for in the cost estimates the EPA has developed for this particular facility.

The commenter alluded to control performance data that it shared with the EPA. We note that the commenter has provided pilot scale data as part of the 2010 rulemaking (see Docket item EPA–HQ–OAR–2002–0051–2073), but has not provided data on the effects of increasing carbon injection on mercury emissions for a full scale facility. We note that in the electric utility industry, where there is significantly more experience with ACI, it is well established that higher carbon injection rates increase mercury removal (Sjostrom, S.; Durham, M.; Bustard, J. Martin, C.; ''Activated Carbon Injection for Mercury Control: Overview'', FUEL, 89, 6, 1320 (2010)). There is no data to indicate that ACI systems in the cement industry would behave differently than those in the utility industry. Given the lack of data on the efficacy of increasing carbon injection rates on mercury removal for full scale cement operations, we cannot conclude that increasing carbon injection is not a

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[11] The commenter's argument that section 112 (d)(2)'s requirement that the EPA consider ''the cost of achieving such emission reduction'' limits the EPA to considerations of economic achievability, and not cost effectiveness, is misplaced. See *Husqvarna AB* v. *EPA,* 254 F. 3d 195, 200 (DC Cir. 2001) (cost effectiveness properly considered in evaluating cost of compliance under CAA section 213, a technology-based provision similar to section 112 (d)(2)). The commenter's further argument that the requirement in section 112 (d)(2) for standards to result in ''the maximum degree of reduction in emissions of hazardous air pollutants * * * achievable'' considering cost and other factors constrains the EPA's ability to consider cost-effectiveness or otherwise balance the statutory factors has likewise been rejected. See *Sierra Club* v. *EPA,* 325 F. 3d 374, 378 (DC Cir. 2003) (the EPA was left with great discretion in determining how to balance such factors when considering technology-based standards which are to result in maximum reductions achievable).

reasonable approach for increasing mercury removal efficiency.

C. Standards for Fugitive Emissions From Open Clinker Storage Piles

The EPA proposed that cement kilns control fugitive emissions from open clinker storage piles, defined at proposal as ''any clinker storage pile that is not completely enclosed in a building or structure''. These piles would be controlled through the use of work practices which minimized emissions by means of (among others) partial enclosure, damping down the pile by chemical or physical means or shielding piles from wind. These work practices were drawn from permits for existing cement kilns, and every cement kiln appears to already be utilizing some type of work practice to minimize fugitive emissions from open clinker storage piles. See 77 FR 42378. Cement kiln sources were allowed to select from among the specified work practices and choose those most suitable for its operations.

For both new and existing sources, the NESHAP is amended to require that one or more of the control measures identified in the rule be used to minimize fugitive dust emissions from open clinker storage piles. The work practices would apply to open clinker storage piles regardless of the quantity of clinker or the length of time that the clinker pile is in existence.

In addition, the owner or operator must include as part of their operations and maintenance plan (required in § 63.1347) the location of their open clinker storage piles and the fugitive dust control measures as specified in this rule that will be implemented to control fugitive dust emissions from open clinker piles. We agree with comments received that the list of allowed work practices reflects all of the available practices documented in cement kiln facility operating permits to control clinker storage pile fugitive emissions. The size, type and duration of a clinker pile may warrant different types of work practices. The final rule requires that one or more of a variety of work practices need to be employed, recognizing that the source will use the work practices that will be effective for the particular piles. Thus, the EPA has revised the list of work practices to be consistent with those listed in the proposal preamble. These are: Use of partial enclosures, using a water spray or fogging system, applying appropriate dust suppression agents, using a wind barrier and using a tarp. Commenters also requested that the EPA allow other work practices if approved by the delegated authority. Our regulations already provide procedures for sources to seek approval of alternative work practices. See section 112(h)(3) as implemented by 40 CFR 63.8(f).

Several industry commenters stated that the definition of clinker pile is problematic as proposed because it was not limited by size or duration. Commenters note that it is not uncommon for small amounts of clinker to be dropped, or to fall off a front-loader onto the ground when being moved from a kiln to a storage location or from such a location to the grinding mill. Because these are small amounts of clinker, it is also not uncommon that these small quantities of clinker will remain where they were dropped and may not be picked up or removed until the necessary manpower becomes available; in some cases this could be multiple days. Another industry commenter noted that because of the short-term duration of temporary clinker stockpiles, the use of work practices similar to those proposed for clinker storage piles is not feasible. The industry trade association suggested the following definition: ''Open clinker storage pile means an outdoor, unenclosed accumulation of clinker on the ground, which contains in excess of 50,000 tons of clinker, and is utilized for a continuous period in excess of 180 days.'' Under this suggested approach, only a clinker storage pile meeting this definition would be subject to the work practice standards.

We are not adopting this approach. We believe that the potential to emit may be different at different sites for a variety of reasons such as weather and traffic conditions. Nor did the commenter provide information indicating that open clinker storage piles of less than 50,000 tons or stored for less than 180 days are unlikely to produce fugitive emissions. Indeed, as a result of weather, traffic or other conditions, smaller piles stored for shorter periods have the evident potential to emit substantial levels of fugitive emissions. Nor is any such uniformly applicable distinction based on duration evident. Clinker piles can be temporary but be replaced by a new pile at the same (or nearby) location a few days later, with no essential difference in fugitive emissions.

Nonetheless, we believe that the commenter is correct that spills are unavoidable, and that work practices designed for non-temporary piles cannot feasibly be applied in such circumstances. The commenter is also correct that work practices used for non-temporary piles would be misapplied to temporary piles attributable to cleaning storage structures. For these reasons, the definition of ''open storage pile'' excludes these types of piles. Specifically, the definition of open clinker storage pile does not include temporary piles of clinker that are the result of accidental spillage or temporary use of outdoor storage while clinker storage buildings are being cleaned. This final rule defines ''temporary'' to mean piles that remain in place for 3 days or less from their generation (3 days accommodating weekend scheduling). This is sufficient time to either pick these spills up (the applicable work practice for these spills) or to cover them to prevent fugitive emissions.

These final amendments will result in a cost savings to the industry as compared to the 2010 rule. As a result of requiring work practices instead of enclosures, we estimate that there will be a savings of $8.25 million annually. See Final Portland Cement Reconsideration Technical Support Document, December 20, 2012, in this rulemaking docket.

D. September 9, 2015, Compliance Date for the Amended Existing Source Standards

The EPA proposed to establish September 9, 2015, as the compliance date for the amended existing source NESHAP standards. The basic reason for the proposed compliance date was that the proposed change in the PM standard made possible different compliance alternatives for all of the stack emission standards, and that it could legitimately take two years from the original compliance date to implement these new compliance strategies. See 77 FR 42385–87. Further, the amended compliance date would apply to all of the stack emission standards due to the interrelatedness of the standards: the mercury, THC and HCl standards all typically involve some element of PM generation and capture and so the controls must be integrated with PM control strategies. Id. at 42386.

The record for this final rule supports the need for the September 9, 2015 compliance date. With respect to PM control, as the EPA explained at proposal, plants now have the option of retaining electrostatic precipitators (ESP) with modification or downstream polishing baghouses, rather than replacing ESP with baghouses. Plants may also size baghouses differently (with or without incorporation of upstream or downstream polishing elements). The various types of sorbent injection strategies to control organics, mercury and HCl, are affected by the PM limits (and vice versa). Based on the facts of this record for this source category, the type, size and aggressiveness of the controls for these HAP, as well as the PM controls, are not only interdependent but can all change as a result of the amended PM standard. In addition, the amended alternative oHAP standard affords additional compliance alternatives for control of non-dioxin organic HAP, including alternatives to use of Residual Thermal Oxidizers. See generally, Final Portland Cement Reconsideration Technical Support Document, section 3.1, December 2012, in the docket for this rulemaking.

Determining, developing, installing, testing and otherwise implementing a different comprehensive HAP control regime takes time. Specifically, plants will need to conduct engineering studies, determine the most cost-effective control strategy, seek contract bids, purchase equipment, install and test the new equipment. Below is an estimate of a timeline for a cement kiln to undertake these steps.

TIME NEEDED TO PREPARE FOR COMPLIANCE

[Docket item EPA–HQ–OAR–2011–0817–0505–A1]

Steps in preparing for compliance	Time period
New engineering study	January–April 2013.
Selection of technology providers	April–August 2013.
Technology procurement	August–December 2013.
Detailed technology design and final engineering	January–June 2014.
Equipment fabrication and permitting	June–December 2014.
Construction and tying into existing operation	January–May 2015.
Technology commissioning	June–August 2015.

One commenter, sharply opposing any change in compliance date, maintained that all of this reasoning is hypothetical and that such a consequential extension could not legitimately rest on speculation. The EPA disagrees that this analysis is speculative. First, the EPA's engineering judgment is that the changes in the PM standard and alternative oHAP standard, open up different compliance alternatives from those under the 2010 rule. The EPA has indicated what those alternatives can be, and the time needed to determine, purchase, install and test them. Comments from the affected industry are consistent with the EPA's engineering judgment as to the type of different compliance approaches now available for existing sources.

The EPA's engineering determinations as to the time needed for cement kilns to implement a different multi-HAP control strategy here are moreover consistent with the agency's long-standing analysis (i.e. analysis not specific to the cement industry) of the time needed to install multipollutant control systems. See US EPA, Engineering and Economic Factors Affecting the Installation of Control Technologies for Multipollutant Strategies, EPA–600/R–02/073, October 2002) (cited at 77 FR 42386). Therefore, the EPA estimated that it is normal for the development and implementation of new compliance measures to take between 15–27 months for single control systems, and longer for systems involving multiple controls for HAP and criteria pollutants, as is the case here.

The record to this rule also contains a survey of 92 of the 97 domestic cement kilns currently in operation. These survey results document, on a kiln by kiln basis, alternative engineering strategies now available to these kilns as a result of the amended PM standard and also documents the time each kiln estimates would be needed to carry out these new compliance strategies. See Comments of PCA, Appendix D (EPA–HQ–OAR–2011–0817–0505). For example, kiln B[12] has the option of modifying its ESP system using a hybrid ESP/baghouse filter system, or of using a cyclone upstream of the ESP. Steps needed to implement these possibilities include main stack evaluation, cooler stack testing, and evaluation, vendor/contractor selection, final design, equipment procurement and fabrication, startup and commissioning, and demonstrating compliance. The plant has already commenced some of these steps, but provides reasonable time estimates for why it would take until September 2015 to complete them. Kiln Q[13] expects to be able to retain its ESP system (whereas it could not under the 2010 final rule), but needs to resize its dust conveying system, upgrade the ESP, and utilize a larger activated carbon injection system differently from planned (since an ESP will not capture mercury as would a baghouse). Steps involved in developing and implementing a system include reviewing the structural integrity of the existing ESP, obtaining proposals on ESP upgrades, relocating an existing stack adjacent to the existing ESP, complete stack design, order equipment for ESP upgrades, order a new stack, contract construction, perform necessary construction, modify the ESP as needed, evaluate CEMS performance and conduct stack testing and make any adjustments to the integrated control system. Again, reasonable timelines for carrying out these steps are provided.

Neither the EPA nor the industry has said definitively what each kiln will do and how long it will take. Until the standards are finalized, no such definitive pronouncement is possible. However, the record is quite specific that additional control strategies are now possible; what the range of those new control strategies are; that the strategies are interrelated so that the standards for PM, organics, mercury and HCl are all implicated; and the time needed to carry out the various strategies. Thus, the commenter is mistaken that the record regarding the need for a compliance date of September 2015 is merely conjectural.

The EPA solicited comment on the possibility of a shorter extension for the stack emission standards, noting that by virtue of the 2010 final rule, the industry was not starting from scratch but could already undertake compliance steps. See 77 FR 42386/3. The survey results referred to above confirm that this is the case, since a number of plants (to their credit) indicated that they have taken preliminary steps toward compliance such as conducting stack testing, and testing various control strategies (e.g., survey results for kilns A, F and G). Nonetheless, many commenters made the evident point that this preliminary work could only go so far when there was uncertainty about

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[12] For competitiveness reasons, kilns in this survey are identified by letter. The survey results are consistent with the EPA's engineering understanding and judgment, and the EPA has no reason to dispute the overall survey results (although some details may be open to question).

[13] These examples were chosen at random by the EPA from the survey information provided in the comment.

the final standard and uncertainty around which standard would determine their final control strategy. Moreover, even those plants which had begun preliminary compliance steps indicated (with specific timelines provided) that the remaining work would legitimately stretch through the summer of 2015.

This same record refutes those comments maintaining that an even longer compliance extension is needed. Not only is this inconsistent with the EPA's own estimates, but the industry survey results document that no further time is needed. See CAA section 112(i)(3)(A) (compliance with CAA section 112(d) standards to be as expeditious as practicable). Therefore, the EPA is revising the compliance date for existing sources for PM, THC, HCl, and Hg to be September 9, 2015.

However, the EPA is establishing February 12, 2014, as the compliance date for the standards for existing open clinker piles. These standards are not inter-related to the stack emission standards, and so need not be on the same timeline. The work practices we are adopting as the standards reflect practices already in place throughout the entire industry. The time needed to come into compliance consequently is to establish a reporting and recordkeeping apparatus, and in some instances to obtain approval (after appropriate demonstration) to use work practices not enumerated in the standard. The EPA estimates that these various steps should not exceed twelve months. Since section 112(i)(3)(A) requires compliance to be as expeditious as practicable, the EPA is establishing a 12 month compliance period for these standards.

A compliance date for an amended standard must still be ''as expeditiou[s] as practicable'' and not more than 3 years. We believe a compliance extension is appropriate where, as here, for the stack emission standards, the amended result in a compliance regime differs from the initial rule and additional time is needed to develop, install, and implement the controls needed to meet the amended standard. The EPA has shown that to be the case here, as explained above.

The Sierra Club in its comments also argued that the EPA could not change the 2013 compliance date in the 2010 final rule as a matter of law. The commenter rests this argument on CAA sections 112(d)(7) and 112(i)(3)(A). We have responded above to the argument based on section 112(d)(7). Section 112(d)(7) simply is not an anti-backsliding provision (or, at the least, does not have to be interpreted that way).

CAA Section 112(i)(3)(A) states in relevant part:

> ''[a]fter the effective date of any emissions standard, limitation or regulation * * * the Administrator shall establish a compliance date or dates for each category or subcategory of existing sources, which shall provide for compliance as expeditiously as practicable, but in no event later than 3 years after the effective date of such standard''.

In *NRDC* v. *EPA (Plywood MACT*), 489 F. 3d 1364, 1373–74 (D.C. Cir. 2007) the court held that ''only the effective date of Section 112 emissions standards matters when determining the maximum compliance date.'' 489 F. 3d at 1373 (emphasis original). The EPA, therefore, lacked authority to extend the compliance date when it was only adjusting reporting terms. Id. at 1374. The opinion implies, however, that the EPA may reset the compliance date when the EPA amends the actual standard, as here. If the statute provided an absolute bar on the EPA extending an effective date, there was no reason for the court to distinguish the situation where the EPA amends some ancillary feature of the rule from the situation where the EPA amends the actual standard.[14]

The reason it makes sense for the EPA to have the authority to reestablish a compliance date when it amends a MACT standard is evident. In a technology-based regime like section 112(d), if the technology basis of the standard changes with a change of the standard, it takes time to adopt the revised controls. This result fits the statutory text.

Where the EPA has amended an existing source MACT standard, the compliance date for that amended standard must be as expeditious as practicable, and no later than 3 years from its effective date. Sierra Club argues that the original standard (the one that has been amended) must nonetheless take effect, but that standard no longer exists. It has been amended. Moreover, the result of Sierra Club's approach would force sources to install one technology and rip it out in short order to install another. Congress cannot have mandated this result. See *PCA* v. *EPA,* 655 F. 3d at 189 (staying NESHAP standards for clinker piles—that is, effectively extending their compliance date—because ''the standards could likely change substantially. Thus, industry should not have to build expensive new containment structures until the standard is finally determined.'')[15] [16] Moreover, in the extreme case where the initial standard was outright technically infeasible by any source (and was amended by the EPA to correct this defect), Sierra Club's reading would leave sources with literally no legitimate compliance option.[17] Technology-based standards simply do not work this way.

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[14] Sierra Club maintains that because the revisions to the PM standard leave that standard nearly as stringent as the 2010 standard, all that has effectively changed is the standard's averaging time. Sierra Club likens this situation to the amendments to ancillary provisions like reporting at issue in *Plywood MACT.* This is incorrect. First, as explained in section V.A. above, the standard did increase numerically as a result of removing commercial incinerators from the database. Portland Cement Reconsideration Technical Support Document, June 15, 2012, Docket item EPA–HQ–OAR–2011–0817–0225. Second, although the amended PM standard is relatively as stringent as the 2010 standard (75 FR 54988/2 and 77 FR 42389/3), it nonetheless affords different compliance options for all of the standards, as explained above and in further detail in the Response to Comment document. The standard allows flexibility for those days when emissions increase as a result of normal operating variability, without significantly affecting the long-term average performance for PM and affords different compliance opportunities as a result. Nor does the commenter consider the amendment to the alternative oHAP standard, which amendment likewise affords new compliance opportunities.

[15] In a variant of this argument, Sierra Club maintains that in a situation where the compliance date for an initial existing source MACT standard has not yet passed and the EPA amended that standard to make it more stringent, the EPA would nonetheless leave the predecessor less stringent standard in place and require compliance with it. Although this situation has not arisen, the EPA would presumably be governed by the same principle noted by the *PCA* court: is the technology basis for the standard changing in such a way as to require more time for compliance and in a way that negates the compliance strategy of the initial rule. (Of course, if the compliance date of a standard has already occurred and a standard is later amended, that compliance date would not change retroactively.)

[16] Sierra Club maintains that *PCA* is distinguishable because it involved a standard which the EPA was compelled to change. First, the comment is factually mistaken. The EPA had granted reconsideration of the clinker pile standards but had not indicated that the standards would be amended. See 76 FR 28325/1 (May 17, 2011). Nor did the court indicate that the pile standards must change. Rather, ''[b]ecause EPA will now be receiving comments for the first time, the standards *could* likely change substantially.'' 655 F. 3d at 189 (emphasis supplied). Thus, the court effectively reset the compliance date because of a potential future change in the rule which could result in a compliance regime which differed from that in the 2010 final rule. This is directly parallel to the situation now presented by the amended PM and alternative oHAP standards.

[17] An example is the startup and shutdown standard for HCl in the 2010 final rule. The EPA established this standard as zero on the mistaken assumption that no chlorine could be present in the kiln during there periods. See 76 FR 28325 (granting consideration on this basis). The commenter's approach would leave this technically infeasible standard and its compliance date in place without recourse.

E. Eligibility To Be a New Source Under NESHAP

CAA section 112(a)(4) states that a new source is a stationary source if ''the construction or reconstruction of which is commenced after the Administrator first proposes regulations under this section establishing an emissions standard applicable to such source.'' As we explained previously, there is some ambiguity in the language ''first proposes'' and such language could refer to different dates in different circumstances, such as the first time the Agency proposes any standards for the source category, the first time the Agency proposes standards under a particular rulemaking record for the source category, or the first time the Agency proposes a particular standard.

In the proposed reconsideration rule, the EPA proposed to retain May 6, 2009, as the date which determines new source eligibility and solicited comment on this issue. Industry commenters stated that we should change the date for determining new source status from May 9, 2009 to July 18, 2012, the date of the proposed reconsideration rule. In support, they asserted that they will not know what the final standards are until we finalize the reconsideration rule. We disagree with the commenters' suggestion and are retaining the May 6, 2009 date as the date that determines whether a source is a new source under CAA section 112(a)(4).

As we explained at proposal, it is reasonable to retain the May 6, 2009 date as the date the Agency ''first proposed'' standards for this source category. This is the date that EPA first proposed these standards under this particular rulemaking record. Today's action is a reconsideration action, and although it revises the particulate matter new source standard, it is premised on the same general rulemaking record. It is thus reasonable to view the date EPA ''first proposes'' standards to be the May 2009 date. Further, industry commenters essentially advocate an approach whereby any time the Agency changes a new source standard, in any way, on reconsideration, the new source trigger date would change. Such a result is not consistent with Congress' intent in defining the term ''new source'' in section 112(a)(4), to be the date the Agency ''first proposes'' standards. Furthermore, EPA notes that the new source standards finalized today are ones that will be met, in our view, using the same or similar control technologies as would be used to meet the standards issued in May 2010, and commenters have not disputed this conclusion. See 77 FR 42387.

VI. Summary of Cost, Environmental, Energy and Economic Impacts

A. What are the affected sources?

As noted in the proposed rule, the EPA estimates that by 2013 there will be 100 Portland cement manufacturing facilities located in the U.S. and Puerto Rico that are expected to be affected by this final rule, and that approximately 5 of those facilities are new greenfield facilities. All these facilities will operate 156 cement kilns and associated clinker coolers. Of these kilns, 23 are CISWI kilns. These have been removed from our data set used to establish existing source floors. Based on capacity expansion data provided by the PCA, by 2013 there will be 16 kilns and their associated clinker coolers subject to NESHAP new source emission limits for PM, mercury, HCl and THC, and 7 kilns and clinker coolers subject to the amended NSPS for nitrogen oxide and SO_2. Some of these new kilns will be built at existing facilities and some at new greenfield facilities.

B. How did the EPA evaluate the impacts of these amendments?

For these final amendments, we determined whether additional control measures, work practices and monitoring requirements would be required by cement manufacturing facilities to comply with the amended rules, incremental to the 2010 final standards (since any other comparison would result in double counting). For any additional control measure, work practice or monitoring requirement we determined the associated capital and annualized cost that would be incurred by facilities required to implement the measures. Finally, we considered the extent to which any facility in the industry would find it necessary to implement any of the additional measures in order to comply with these final amendments. Using this approach, we assessed potential impacts from the proposed revisions.

These final amendments to the 2010 rule are expected to result in lower costs for the Portland cement industry. The final amendment to the PM standard affords alternative, less costly compliance opportunities for existing sources. See section V.D above. These could be utilizing existing PM control devices rather than replacing them (for example, retaining an ESP or a smaller baghouse), or supplementing existing PM control rather than replacing it (putting polishing controls ahead of the primary PM control device, for instance). Compliance strategies for the other HAP, all of which involve some element of PM control, also may be affected. Cost savings from these alternatives could be significant. There are also potential cost savings associated with the amended oHAP alternative standard (which now may be a viable compliance alternative for some sources since issues of reliable analytic measurement have been resolved). Following proposal, industry submitted kiln specific information on likely changes in compliance strategy resulting from the proposed amendments so that we are now better able to estimate potential savings resulting from the final amendments. Based on an industry survey of 18 Portland cement facilities (20 kilns) after proposal (see Docket item EPA–HQ–OAR–2011–0817–0505, Appendix D), it appears that the amendments may have the following effects, which may result in savings in capital and annual costs associated with implementing control technologies for these pollutants:

- Regenerative thermal oxidizers (RTO) may not need to be installed due to the amended oHAP alternative.
- Carbon injection rates may be lowered or not required for THC control.
- Existing PM controls (ESP and baghouse) may not need to be replaced, but may instead be upgraded.
- Additional PM controls may not have to be implemented.
- Polishing and hybrid filter configurations may be implemented instead of total replacements.

There are also certain costs, and cost savings, associated with other provisions of the final amendments. There may be a difference in costs of stack testing for PM and use of a CPMS, rather than use of a PM CEMS. In addition, there are cost savings when changing from a PM CEMS compliance demonstration to a CPMS demonstration. For example as part of the PS 11 calibration requirements, a minimum of 15 Method 5 test runs are required to develop a correlation curve, with no limit to the maximum number of test runs. Omitting the need for these multiple test runs will save the facility a minimum of $20,000 per kiln (each Method 5 test costs $5,000). At a savings of $20,000 per kiln, nationwide savings for 133 new and existing kilns, would be $2.7 million per year. However, the CPMS is the same type of device as a PM CEMS, so the capital cost of the CPMS would not be significantly different than the CEMS device.

The final revisions to the alternative organic HAP standard (from 9 ppm to 12 ppm, reflecting the analytic method practical quantitation limit) would allow more sources to select this compliance alternative and demonstrate compliance without needing to install very expensive and energy-intensive RTO. In addition, providing parametric monitoring flexibilities (not present in the 2010 final rule) will provide lower costs for the better-performing sources in the industry. See section IV.B above. We have quantified these savings (see Final Portland Cement Reconsideration Technical Support Document, December 20, 2012, Section 3).

The revisions to the standard for open clinker storage piles codify current fugitive dust control measures already required by most states, so no impacts are expected. These final standards would be significantly less expensive than the controls for open piles in the 2010 final rule, which required enclosures in all instances. We estimate that the savings to industry over the 2010 rule will be $8.25 million annually. See Final Portland Cement Reconsideration Technical Support Document, December 20, 2012, in this rulemaking docket.

We have estimated the additional industry cost associated with the affirmative defense to civil penalties provisions. We estimate the additional cost is $3,258 per year for the entire industry. See Supporting Statement in the docket.

One of the final revisions would allow sources that control HCl with dry scrubbers to use periodic performance testing and parametric monitoring rather than monitoring compliance with an HCl CEMS. This will provide those sources with additional flexibility in complying with the HCl standard.

The revision to the alternative PM emissions limit provisions merely recognizes that sources other than the clinker cooler may combine their exhaust with the kiln exhaust gas and corrects the equation for calculating the alternative limit. Therefore, there should be no impacts from this revision.

The amendments provide for work practices rather than numerical standards during periods of startup and shutdown. The work practice standards reflect common industry practices, so there should be no costs associated with them. There should also be substantial savings associated with the work practices.

At an annual cost of about $51,000 per year ($22,800 per Method 30B test for mercury + $8,000 per year for Method 25A test for THC + $20,000 per year for Method 321 test for HCl), the final revisions for new testing and monitoring of coal mills that use kiln exhaust gases to dry coal and exhaust through a separate stack are not expected to have significant impacts.

The revisions would make existing kilns that undergo a modification, as defined by NSPS, subject to a PM standard of 0.07 lb/ton clinker, 3-run average. There may be less costly compliance alternatives under the amended standard, similar to alternatives available under the amended existing source NESHAP for PM.

C. What are the air quality impacts?

In these final amendments, emission limits for mercury, THC and HCl are unchanged from the 2010 rule. Thus, there is no change in emissions from the 2010 rule for these HAP and HAP surrogates. The alternative HAP organic standard is being amended to 12 ppm, which is the analytic method practical quantitation limit based on the performance test method detection limit of 4 ppm. The impact on emission levels due to this change is not clear since measuring below the quantitation limit does not yield a value with enough certainty to represent the actual level. Thus, a measurement below 12 ppm could very well actually be 12 ppm or something less. For PM, the limit for existing sources changes from 0.04 lb/ton clinker 30-day average to 0.07 lb/ton clinker based on stack testing. The PM limit for new sources also changed: To 0.02 lb/ton clinker stack test from 0.01 lb/ton clinker 30-day average. The final changes in the PM standards, while not significant in absolute terms, may result in a small increase in total nationwide emissions by allowing slightly more variability, although, as noted at proposal, we estimate that design values will be essentially identical under the 2010 and this final standard. 77 FR 42389. As explained in the impacts analysis for the 2010 rule (see Docket item EPA–HQ–OAR–2002–0051–3438), emission reductions were estimated by comparing baseline emissions to the long-term average emissions of the MACT floor kilns. As a practical matter, plants operate to comply with this lower average emissions level (the so-called design level), rather than the emissions limit, so that on those days where there is normal operating variability they do not exceed the emissions limit. See 77 FR 42386–87. Under the 2010 rule, the average PM emissions from the existing floor kilns were 0.02296 lb/ton clinker. Under the amended standard, the average PM emissions of the existing floor kilns is calculated to be 0.02655 lb/ton clinker although, as noted, this difference is less than the normal analytic variability in PM measurement methods and so must be viewed as directional rather than precisely quantitative. The average emissions for new kilns did not change as we believe new sources will have to adopt identical control strategies as under the promulgated standards. We, therefore, are not estimating an emission increase from new kilns. For existing kilns, with an increase in PM emissions under this final rule of 0.00359 lb/ton clinker compared to the 2010 rule, nationwide emissions of PM would increase by 138 tons per year (0.00359 × 76,664,662/2000). Thus, the EPA estimates that the main effect of this final rule for PM will be to provide flexibility for those days when emissions increase as a result of normal operating variability, but would not significantly alter long-term average performance for PM. Nonetheless, as explained in section V.D above, this change does allow for changes in compliance strategies in the form of types, sizes and sequencing of treatment trains.

Emission reductions under the 2010 rule and this final rule, in 2015, are compared in Table 4.

TABLE 4—COMPARISON OF NATIONWIDE PM EMISSIONS FROM 2010 RULE TO FINAL RULE IN 2015

	Kiln type	2010 rule	Final rule	Increment
Emissions limit (lb/ton clinker	Existing	0.04 (30-day average with a CEMS).	0.07 (3-run stack test)	NA
MACT average emissions for compliance (lb/ton clinker.	Existing	0.02296	0.02655	0.00359
2010 baseline emissions (CISWI kilns removed) (tons/yr).		11,433	11,433	NA
Nationwide emissions reduction (tons/yr)	Total	10,540	10,402	−138

One commenter noted that the compliance extension will result in two additional years of HAP emissions at pre-standard levels, noting especially the emission of PM, noting further that fine PM ($PM_{2.5}$) is causally associated with mortality and serious morbidity effects at a population level. See, e.g., 77 FR 38909 (June 29, 2012). We note first that these rules are technology-based, not risk-based, and that there are compelling reasons to amend the PM standard and to establish new compliance dates for existing sources as a result of technological limitations with the 2010 rule PM standard, and the new compliance opportunities afforded as a result of the amendment to that standard. See section V.D above. We also question the commenter's premise that all of the predicted emission reductions and benefits would accrue if the existing source CEM-based PM standards took effect in September 2013. As explained at length in section V.A above and in other comment responses, PM CEMS would not reliably measure the level of the PM standard in many instances. One cannot assume the full range of emission reductions (and consequent health benefits) would accrue in the real world if the emission measurements themselves are uncertain. Thus, in a meaningful sense, today's amendments result in a regime where the required emission reductions will be reliably measured, so that the rule's health benefits will reliably occur.

D. What are the water quality impacts?

At proposal, we believed that none of the amendments being proposed would have significant impacts on water quality and that to the extent that the revision affecting dry caustic scrubbers encourages their use, some reduction in water consumption may occur although we had no information upon which to base a quantified estimate. We received no comments questioning this assessment. Further, in reviewing the industry survey information on the impacts of the proposed changes, only 1 of the 20 kilns for which information was provided was considering the addition of a wet scrubber, although it was also evaluating a dry scrubber (see docket item EPA–HQ–OAR–2011–0817–0505, Appendix D, kiln S). Therefore, we continue to believe that these final amendments will not significantly impact water quality.

E. What are the solid waste impacts?

None of the amendments being finalized with this final rule are expected to have any solid waste impacts.[18]

F. What are the secondary impacts?

Indirect or secondary air quality impacts include impacts that will result from the increased electricity usage associated with the operation of control devices as well as water quality and solid waste impacts (which were just discussed) that will occur as a result of these amendments. Because we are finalizing revisions that slightly reduce the stringency of the existing source emission limits for PM from the promulgated 2010 limits, we project that some facilities will alter their strategy for complying with the standards for the four pollutants to achieve compliance at a lower cost than possible under the original standard. The survey results discussed in section V.D above confirm the EPA's engineering judgment. Other facilities in the survey that were not able to meet the THC limit or the alternative organic HAP limit in the 2010 rule were considering the installation of RTO. Because some of these facilities may now meet the limit without the installation of an RTO, we have estimated a reduction of 24,702 tons per year less CO_2 emissions being emitted to the atmosphere (equivalent to 2 less RTO's being installed). As a result of the organic HAP limit being revised from 9 ppm to 12 ppm, these sources responded that they now had other less costly alternatives. The additional compliance time was also cited as a factor that would gives sources the additional time they needed to consider other HAP control alternatives to RTO. As the industry survey highlights, these types of determinations will be made for each facility based on site-specific characteristics such as process type, equipment age, existing air pollution controls, raw material and fuel characteristics, economic factors and others. In general, this survey indicates that the combination of the revised limits for PM and organic HAP as well as the September 2015 compliance date will give sources the opportunity to develop less costly and less aggressive compliance strategies. We do not have enough information to quantify the impact of overall secondary impacts, (with the exception of the CO_2 reductions noted above), but we believe the impacts would in fact be reduced relative to the 2010 rule since less energy is expected to be needed for facilities that can retain and upgrade their current controls, instead of for example, installing additional controls in series.

G. What are the energy impacts?

As discussed in the preceding section, because of the final revisions to the PM emission limits, the organic HAP limits and the compliance date extension, some facilities will develop more cost effective and less energy intensive compliance strategies. For three of the facilities (five kilns) that were part of the industry survey, all five kilns required significant changes to meet the 2010 THC standard, in part because they were not pursuing the alternative organic HAP alternative standard due to analytic measurement uncertainties. See docket item EPA–HQ–OAR–2011–0817–0505, Appendix D (kilns A, C and D, and F and G). Prior to the proposed revisions, all five of the kilns were considering RTO as a control option as well as other options including catalytic ceramic filtration, a relatively new technology and as yet, not completely demonstrated technology for the cement industry. In response to the survey of what changes, if any, the facilities would make in response to the proposed revisions, all three facilities indicated that the amended organic HAP limit or the September 2015 compliance date allowed them to consider the use of less capital intensive alternatives and to continue testing alternatives for THC reduction other than the highly energy-intensive RTO for the five kilns involved. Although we cannot accurately predict for the entire industry the extent to which these site-specific compliance strategies may affect energy demands, the industry survey results indicate a trend toward less energy intensive strategies than RTO, and as noted above, we predict a reduction in CO_2 emissions due to less energy use as a result of two fewer kilns installing RTOs.

H. What are the cost impacts?

Under the cost scenario discussed above, we estimate that there could be savings of approximately $52 million associated with alternative compliance strategies for meeting amended PM standards, making corresponding adjustments in compliance strategies for the organic HAP and requiring work practice for open clinker storage piles. Table 5 summarizes the costs and emissions reductions of this final action.

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[18] Although dust shuttling is likely to be one element of mercury compliance strategy, the amount of dust shuttling would not increase incremental to the 2010 final rule since the standards for new and existing sources are the same in the 2010 final rule and these amendments. Moreover, as explained in section V.B above, even with respect to the high mercury feed source, dust shuttling entails moving dust from within the kiln to other parts of the process and is considered a closed loop process, thereby not causing any waste impacts.

TABLE 5—SUMMARY OF THE COSTS AND EMISSION REDUCTIONS OF THE FINAL AMENDMENTS TO THE PORTLAND CEMENT MANUFACTURING INDUSTRY NESHAP RELATIVE TO THE 2010 RULE [a b c d e]

Proposed amendment	Annualized cost	PM emissions reduction 2010 rule	PM emissions reduction 2012 rule	Emission change tpy
Revised PM, oHAP standard	($42.2 million) [f]	10,540 tons	10,402 tons	138 increase.
Replace PM CEMS with PM CPMS	($2.7 million)	0.		
Coal Mill Testing	$1.3 million	0.		
Open clinker storage pile work practices	($8.25 million)	0.		
Total	($51.85 million).			

[a] Parentheses indicate cost savings. All costs are in 2005 dollars.

[b] We also estimate that there will be a one-time cost of $25,000 for each facility to revise their operation and maintenance plan to include procedures to minimize emissions during periods of startup and shutdown.

[c] Emissions reductions are the total once full compliance is achieved in 2015.

[d] Full compliance costs will not occur until September 9, 2015.

[e] Note emission reductions published in the 2010 rule included CISWI kilns, but the reductions in this table reflect reductions since CISWI kilns were removed from the database.

[f] Includes cost savings due to revised PM standard.

The cost information in Table 5 is in 2005 dollars at a discount rate of 7 percent. The EPA did not have sufficient information to quantify the overall change in benefits or impacts in emissions for 2013 to 2015.

With regard to the coal mill monitoring requirements in this action, sources with integral coal mills that exhaust through a separate exhaust would potentially incur a capital cost of $36,000 to install a continuous flow meter. The annualized cost of a flow meter is $11,000. Because this final rule allows the use of maximum design flow rate instead of installing flow meters, we believe that most facilities will take advantage of this and will not incur these costs. Annual testing at these coal mills for mercury, THC and HCl will cost about $51,000 ($22,800 per Method 30B test for mercury + $8,000 per year for Method 25A test for THC + $20,000 per year for Method 321 test for HCl). Using information supplied by the industry (see docket item EPA–HQ–OAR–2011–0817–0612), approximately 26 facilities would be affected by these requirements for an annual cost of $1.3 million. Costs for coal mills to meet the PM limits for this NESHAP are not included, since all equipment and monitoring are in place to meet requirements of Subpart Y and thus are not considered additional costs.

With the final change to PM CPMS instead of CEMS, it is estimated that the elimination of the PS correlation tests will result in a savings of $20,000 per kiln.

I. What are the health effects of these pollutants?

In this section, we provide a qualitative description of benefits associated with reducing exposure to $PM_{2.5}$, HCl and mercury. Controls installed to reduce HAP would also reduce ambient concentrations of $PM_{2.5}$ as a co-benefit. Reducing exposure to $PM_{2.5}$ is associated with significant human health benefits, including avoiding mortality and morbidity from cardiovascular and respiratory illnesses. Researchers have associated $PM_{2.5}$ exposure with adverse health effects in numerous toxicological, clinical and epidemiological studies (U.S. EPA, 2009).[19] When adequate data and resources are available and a regulatory impact analysis (RIA) is required, the EPA generally quantifies several health effects associated with exposure to $PM_{2.5}$ (e.g., U.S. EPA, 2011).[20] These health effects include premature mortality for adults and infants, cardiovascular morbidities such as heart attacks, hospital admissions and respiratory morbidities such as asthma attacks, acute and chronic bronchitis, hospital and emergency department visits, work loss days, restricted activity days and respiratory symptoms. Although the EPA has not quantified certain outcomes including adverse effects on birth weight, pre-term births, pulmonary function and other cardiovascular and respiratory effects, the scientific literature suggests that exposure to $PM_{2.5}$ is also associated with these impacts (U.S. EPA, 2009). $PM_{2.5}$ also increases light extinction, which is an important aspect of visibility (U.S. EPA, 2009).

HCl is a corrosive gas that can cause irritation of the mucous membranes of the nose, throat and respiratory tract. Brief exposure to 35 ppm causes throat irritation, and levels of 50 to 100 ppm are barely tolerable for 1 hour.[21] The greatest impact is on the upper respiratory tract; exposure to high concentrations can rapidly lead to swelling and spasm of the throat and suffocation. Most seriously exposed persons have immediate onset of rapid breathing, blue coloring of the skin and narrowing of the bronchioles. Exposure to HCl can lead to RADS, a chemically- or irritant-induced type of asthma. Children may be more vulnerable to corrosive agents than adults because of the relatively smaller diameter of their airways. Children may also be more vulnerable to gas exposure because of increased minute ventilation per kilograms and failure to evacuate an area promptly when exposed. HCl has not been classified for carcinogenic effects.[22]

Mercury in the environment is transformed into a more toxic form, methylmercury (MeHg). Because mercury is a persistent pollutant, MeHg accumulates in the food chain, especially the tissue of fish. When people consume these fish, they consume MeHg. In 2000, the National

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[19] U.S. Environmental Protection Agency (U.S. EPA). 2009. *Integrated Science Assessment for Particulate Matter* (Final Report). EPA–600–R–08–139F. National Center for Environmental Assessment-RTP Division. Available on the Internet at *http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=216546.*

[20] U.S. Environmental Protection Agency (U.S. EPA). 2011. Regulatory Impact Analysis for the Federal Implementation Plans to Reduce Interstate Transport of Fine Particulate Matter and Ozone in 27 States; Correction of SIP Approvals for 22 States. Office of Air and Radiation, Research Triangle Park, NC. Available on the Internet at *http://www.epa.gov/airtransport/pdfs/FinalRIA.pdf.*

[21] Agency for Toxic Substances and Disease Registry (ATSDR). Medical Management Guidelines for Hydrogen Chloride. Atlanta, GA: U.S. Department of Health and Human Services. Available online at *http://www.atsdr.cdc.gov/mmg/mmg.asp?id=758&tid=147#bookmark02.*

[22] U.S. Environmental Protection Agency (U.S. EPA). 1995. Integrated Risk Information System File of Hydrogen Chloride. Research and Development, National Center for Environmental Assessment, Washington, DC. This material is available electronically at *http://www.epa.gov/iris/subst/0396.htm.*

Academy of Science (NAS) Study was issued which provides a thorough review of the effects of MeHg on human health (National Research Council (NRC), 2000).[23] Many of the peer-reviewed articles cited in this section are publications originally cited in the MeHg Study. In addition, the EPA has conducted literature searches to obtain other related and more recent publications to complement the material summarized by the NRC in 2000.

In its review of the literature, the NAS found neurodevelopmental effects to be the most sensitive and best documented endpoints and appropriate for establishing an oral reference dose (RfD) (NRC, 2000); in particular NAS supported the use of results from neurobehavioral or neuropsychological tests. The NAS report noted that studies in animals reported sensory effects as well as effects on brain development and memory functions and support the conclusions based on epidemiology studies. The NAS noted that their recommended endpoints for an RfD are associated with the ability of children to learn and to succeed in school. They concluded the following: ‘‘The population at highest risk is the children of women who consumed large amounts of fish and seafood during pregnancy. The committee concludes that the risk to that population is likely to be sufficient to result in an increase in the number of children who have to struggle to keep up in school.’’

The NAS summarized data on cardiovascular effects available up to 2000. Based on these and other studies, the NRC concluded that ‘‘Although the data base is not as extensive for cardiovascular effects as it is for other end points (i.e. neurologic effects) the cardiovascular system appears to be a target for MeHg toxicity in humans and animals.’’ The NRC also stated that ‘‘additional studies are needed to better characterize the effect of methylmercury exposure on blood pressure and cardiovascular function at various stages of life.’’

Additional cardiovascular studies have been published since 2000. The EPA did not to develop a quantitative dose-response assessment for cardiovascular effects associated with MeHg exposures, as there is no consensus among scientists on the dose-response functions for these effects. In addition, there is inconsistency among available studies as to the association between MeHg exposure and various cardiovascular system effects. The pharmacokinetics of some of the exposure measures (such as toenail mercury levels) are not well understood. The studies have not yet received the review and scrutiny of the more well-established neurotoxicity data base.

The Mercury Study[24] noted that MeHg is not a potent mutagen but is capable of causing chromosomal damage in a number of experimental systems. The NAS concluded that evidence that human exposure to MeHg caused genetic damage is inconclusive; they note that some earlier studies showing chromosomal damage in lymphocytes may not have controlled sufficiently for potential confounders. One study of adults living in the Tapajós River region in Brazil (Amorim et al., 2000) reported a direct relationship between MeHg concentration in hair and DNA damage in lymphocytes; as well as effects on chromosomes.[25] Long-term MeHg exposures in this population were believed to occur through consumption of fish, suggesting that genotoxic effects (largely chromosomal aberrations) may result from dietary, chronic MeHg exposures similar to and above those seen in the Faroes and Seychelles populations.

Although exposure to some forms of mercury can result in a decrease in immune activity or an autoimmune response (ATSDR, 1999), evidence for immunotoxic effects of MeHg is limited (NRC, 2000).[26]

Based on limited human and animal data, MeHg is classified as a ‘‘possible’’ human carcinogen by the International Agency for Research on Cancer (IARC, 1994) and in Integrated Risk Information System (IRIS) (U.S. EPA, 2002).[27] [28] The existing evidence supporting the possibility of carcinogenic effects in humans from low-dose chronic exposures is tenuous. Multiple human epidemiological studies have found no significant association between mercury exposure and overall cancer incidence, although a few studies have shown an association between mercury exposure and specific types of cancer incidence (e.g., acute leukemia and liver cancer) (NRC, 2000).

There is also some evidence of reproductive and renal toxicity in humans from MeHg exposure. However, overall, human data regarding reproductive, renal and hematological toxicity from MeHg are very limited and are based on either studies of the two high-dose poisoning episodes in Iraq and Japan or animal data, rather than epidemiological studies of chronic exposures at the levels of interest in this analysis.

VII. Statutory and Executive Order Reviews

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review

Under Executive Order 12866 (58 FR 51735, October 4, 1993), this action is a ‘‘significant regulatory action’’ because it raises novel legal or policy issues. Accordingly, the EPA submitted this action to the Office of Management and Budget (OMB) for review under Executive Orders 12866 and 13563 (76 3821, January 21, 2011) and any changes made in response to OMB recommendations have been documented in the docket for this action. An RIA was prepared for the September 2010 final rule and can be found at: *http://www.epa.gov/ttn/ecas/regdata/RIAs/portlandcementfinalria.pdf. http://www.epa.gov/ttn/ecas/regdata/RIAs/portlandcementfinalria.pdf.*

B. Paperwork Reduction Act

The information collection requirements in this final rule have been submitted for approval to the OMB under the *Paperwork Reduction Act,* 44 U.S.C. 3501, *et seq.*

The Information Collection Request (ICR) document prepared by the EPA has been assigned the EPA ICR number 1801.11 for the NESHAP; there are no additional recordkeeping and reporting requirements for the NSPS. The information requirements are based on notification, recordkeeping and reporting requirements in the NESHAP

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[23] National Research Council (NRC). 2000. *Toxicological Effects of Methylmercury.* Washington, DC: National Academies Press.

[24] U.S. Environmental Protection Agency (U.S. EPA). 1997. *Mercury Study Report to Congress,* EPA–HQ–OAR–2009–0234–3054. December. Available on the Internet at *http://www.epa.gov/hg/report.htm.*

[25] Amorim, M.I.M., D. Mergler, M.O. Bahia, H. Dubeau, D. Miranda, J. Lebel, R.R. Burbano, and M. Lucotte. 2000. Cytogenetic damage related to low levels of methyl mercury contamination in the Brazilian Amazon. An. Acad. Bras. Science. 72(4): 497–507.

[26] Agency for Toxic Substances and Disease Registry (ATSDR). 1999. Toxicological Profile for Mercury. U.S. Department of Health and Human Services, Public Health Service, Atlanta, GA.

[27] U.S. Environmental Protection Agency (EPA). 2002. Integrated Risk Information System (IRIS) on Methylmercury. National Center for Environmental Assessment. Office of Research and Development. Available online at *http://www.epa.gov/iris/subst/0073.htm.*

[28] International Agency for Research on Cancer (IARC). 1994. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans and their Supplements: Beryllium, Cadmium, Mercury, and Exposures in the Glass Manufacturing Industry. Vol. 58. Jalili, H.A., and A.H. Abbasi. 1961. Poisoning by ethyl mercury toluene sulphonanilide. Br. J. Indust. Med. 18(Oct.):303–308 (as cited in NRC 2000).

General Provisions (40 CFR part 63, subpart A), which are mandatory for all operators subject to national emissions standards. These recordkeeping and reporting requirements are specifically authorized by CAA section 114 (42 U.S.C. 7414). All information submitted to the EPA pursuant to the recordkeeping and reporting requirements for which a claim of confidentiality is made is safeguarded according to agency policies set forth in 40 CFR part 2, subpart B.

We are finalizing new paperwork requirements for the Portland Cement Manufacturing source category in the form of a requirement to incorporate work practices for periods of startup and shutdown and fugitive dust control measures for clinker piles into their existing operations and maintenance plan.

This final rule also includes new paperwork requirements for recordkeeping of malfunctions, as described in 40 CFR 63.454(g) (conducted in support of the affirmative defense provisions, as described in 40 CFR 63.456).

When a malfunction occurs, sources must report the event according to the applicable reporting requirements of 40 CFR part 63, subpart LLL. An affirmative defense to civil penalties for violations of emission limits that are caused by malfunctions is available to a source if it can demonstrate that certain criteria and requirements are satisfied. The criteria ensure that the affirmative defense is available only where the event that causes a violation of the emission limit meets the narrow definition of malfunction in 40 CFR 63.2 (sudden, infrequent, not reasonable preventable and not caused by poor maintenance and or careless operation) and where the source took necessary actions to minimize emissions. In addition, the source must meet certain notification and reporting requirements. For example, the source must prepare a written root cause analysis and submit a written report to the Administrator documenting that it has met the conditions and requirements for assertion of the affirmative defense.

The EPA is adding the paperwork and recordkeeping associated with the affirmative defense to civil penalties for malfunctions to the estimate of burden in the ICR. To provide the public with an estimate of the relative magnitude of the burden associated with an assertion of the affirmative defense position adopted by a source, the EPA has provided administrative adjustments to the ICR that show what the notification, recordkeeping and reporting requirements associated with the assertion of the affirmative defense might entail. The EPA's estimate for the required notification, reports and records for any individual incident, including the root cause analysis, totals $3,258, and is based on the time and effort required of a source to review relevant data, interview plant employees and document the events surrounding a malfunction that has caused a violation of an emissions limit. The estimate also includes time to produce and retain the record and reports for submission to the EPA. The EPA provides this illustrative estimate of this burden because these costs are only incurred if there has been a violation and a source chooses to take advantage of the affirmative defense.

Given the variety of circumstances under which malfunctions could occur, as well as differences among sources' operation and maintenance practices, we cannot reliably predict the severity and frequency of malfunction-related excess emissions events for a particular source. It is important to note that the EPA has no basis currently for estimating the number of malfunctions that would qualify for an affirmative defense. Current historical records would be an inappropriate basis, as source owners or operators previously operated their facilities in recognition that they were exempt from the requirement to comply with emissions standards during malfunctions. Of the number of excess emissions events reported by source operators, only a small number would be expected to result from a malfunction (based on the definition above), and only a subset of violations caused by malfunctions would result in the source choosing to assert the affirmative defense. Thus, we expect the number of instances in which source operators might be expected to avail themselves of the affirmative defense will be extremely small. For this reason, we estimate no more than two such occurrences per year for all sources subject to subpart LLL over the 3-year period covered by this ICR. We expect to gather information on such events in the future and will revise this estimate as better information becomes available.

We estimate 86 facilities will be subject to all final standards. The remaining 14 facilities will only be subject to the open clinker pile standards in this action. The annual monitoring, reporting and recordkeeping cost for this source (averaged over the first three years after the effective date of the standards) for these amendments to subpart LLL is estimated to be $352,814 per year for the industry. This includes 496 labor hours per year at a total labor cost of $47,806 per year, and total non-labor capital and operation and maintenance costs of $305,008 per year. This estimate includes reporting and recordkeeping associated with the requirements for open clinker storage piles. The total burden to the federal government (averaged over the first three years after the effective date of the standard) as a result of these amendments is estimated to be 263 hours per year at a total labor cost of $11,885 per year. Burden is defined at 5 CFR 1320.3(b).

An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for the EPA's regulations in 40 CFR are listed in 40 CFR part 9.

C. Regulatory Flexibility Act

The Regulatory Flexibility Act generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations and small governmental jurisdictions.

For purposes of assessing the impact of this rule on small entities, small entity is defined as: (1) A small business whose parent company has no more than 750 employees based on the size definition for the affected NAICS code (327310), as defined by the Small Business Administration size standards; (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

We estimate that 3 of the 26 existing Portland cement entities are small entities and comprise 3 plants. After considering the economic impacts of this final rule on small entities, I certify that this action will not have a significant economic impact on a substantial number of small entities. Of the three affected small entities, all are expected to incur an annual compliance cost of less than 1.0 percent of sales to comply with these amendments to the 2010 final rule (reflecting potential controls on piles, which are likely to have lower cost when compared to the 2010 rule requirements because these plants already have requirements for control of open clinker storage piles in their title V permits).

Although this final rule will not have a significant economic impact on a substantial number of small entities, the EPA nonetheless adopted amendments which should reduce the impact of this final rule on small entities. For example, we are expanding the provision that allows periodic HCl performance tests as an alternative to HCl CEMS for sources equipped with wet scrubbers to also apply to those sources that use dry scrubbers. This final rule also adds an option for sources using wet or dry scrubbers for HCl control to use SO_2 as a monitored parameter. If these sources already have a CEMS for SO_2, then this will provide operational flexibility.

D. Unfunded Mandates Reform Act

This rule does not contain a Federal mandate that may result in expenditures of $100 million or more for State, local and tribal governments, in the aggregate, or the private sector in any one year. As discussed earlier in this preamble, there is an actual savings to the industry of $52 million per year. Thus, this final rule is not subject to the requirements of section 202 and 205 of the UMRA. This final action is also not subject to the requirements of section 203 of the UMRA because it contains no regulatory requirements that might significantly or uniquely affect small governments. This final action contains no requirements that apply to such governments, imposes no obligations upon them, and will not result in expenditures by them of $100 million or more in any one year or any disproportionate impacts on them.

E. Executive Order 13132: Federalism

This final action does not have federalism implications. It will not have substantial direct effects on the states, on the relationship between the national government and the states or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. None of the affected facilities are owned or operated by State governments. Thus, Executive Order 13132 does not apply to this action.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

This action may have tribal implications, as specified in Executive Order 13175 (65 FR 67249, November 9, 2000). The EPA is aware of one tribally owned Portland cement facility currently subject to subpart LLL and that will be subject to this final rule. The provisions of this final rule are not expected to impose new substantial direct compliance costs on Tribal governments since the same control technologies that are necessary under the current NESHAP will be needed to meet the final emissions limits. The EPA has tried to reduce the impact of this final rule on Tribal owned facilities. For example, we are expanding the provision that allows periodic HCl performance tests as an alternative to HCl CEMS for sources equipped with wet scrubbers to also apply to those sources that use dry sorbent injection (i.e., dry scrubbing systems). This final rule adds an option for sources using wet or dry scrubbers for HCl control to use SO_2 as a monitored parameter. If these sources already have a CEMS for SO_2, then this will provide operational flexibility.

G. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

The EPA interprets Executive Order 13045 (62 FR 19885, April 23, 1997) as applying to those regulatory actions that concern health or safety risks, such that the analysis required under section 5–501 of the Executive Order has the potential to influence the regulation. This action is not subject to Executive Order 13045 because it is based solely on technology performance.

H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use

This final action is not a ‘‘significant energy action’’ as defined in Executive Order 13211 (66 FR 28355 (May 22, 2001)), because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. The amendments do not require the use of additional controls as compared to the 2010 rule and may allow the industry to reduce its cost of compliance by increasing the industry's flexibility to institute different and less costly control strategies than under the 2010 rule.

I. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (‘‘NTTAA’’), Public Law No. 104–113 (15 U.S.C. 272 note), directs the EPA to use voluntary consensus standards (VCS) in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. VCS are technical standards (e.g., materials specifications, test methods, sampling procedures and business practices) that are developed or adopted by VCS bodies. NTTAA directs the EPA to provide Congress, through OMB, explanations when the agency decides not to use available and applicable VCS.

This final rulemaking does not involve technical standards. Therefore, the EPA is not considering the use of any voluntary consensus standards.

J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order 12898 (59 FR 7629 (February 16, 1994)) establishes federal executive policy on environmental justice. Its main provision directs federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies and activities on minority populations and low-income populations in the United States.

An analysis of demographic data was prepared for the 2010 final rule and can be found in the docket for that rulemaking (See docket item EPA–HQ–OAR–2002–0051–3415). The impacts of the 2010 rule, which assumed full compliance, are expected to be unchanged as a result of this action. Therefore, beginning from the date of full compliance, the EPA has determined that this final rule will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations because it increases the level of environmental protection for all affected populations without having any disproportionately high and adverse human health or environmental effects on any population, including any minority or low-income populations. In addition, the full benefits of this final rule will not result until 2015 due to the final amended compliance date but the demographic analysis showed that the average of populations in close proximity to the sources, and thus most likely to be affected by the sources, were similar in demographic composition to national averages.

K. Congressional Review Act

The Congressional Review Act, 5 U.S.C. 801, *et seq.,* as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that, before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the

Congress and to the Comptroller General of the United States. The EPA will submit a report containing this final rule and other required information to the U.S. Senate, the U.S. House of Representatives and the Comptroller General of the United States prior to publication of the rule in the **Federal Register**. A major rule cannot take effect until 60 days after it is published in the **Federal Register**. This action is not a ''major rule'' as defined by 5 U.S.C. 804(2). This final rule will be effective on February 12, 2013.

List of Subjects in 40 CFR Part 63

Environmental protection, Air pollution control, Hazardous substances, Reporting and recordkeeping requirements.

Dated: December 20, 2012.

Lisa P. Jackson,

Administrator.

For the reasons stated in the preamble, title 40, chapter I, of the Code of Federal Regulations is amended as follows:

PART 60—[AMENDED]

■ 1. The authority citation for part 60 continues to read as follows:

Authority: 23 U.S.C. 101; 42 U.S.C. 7401–7671q.

Subpart F—[AMENDED]

■ 2. Section 60.61 is amended by adding paragraphs (e) and (f) to read as follows:

§ 60.61 Definitions.

* * * * *

(e) *Excess emissions* means, with respect to this subpart, results of any required measurements outside the applicable range (e.g., emissions limitations, parametric operating limits) that is permitted by this subpart. The values of measurements will be in the same units and averaging time as the values specified in this subpart for the limitations.

(f) *Operating day* means a 24-hour period beginning at 12:00 midnight during which the kiln operates at any time. For calculating rolling 30-day average emissions, an *operating day* does not include the hours of operation during startup or shutdown.

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■ 3. Section 60.62 is amended by:

■ a. Removing and reserving paragraph (a)(1)(i), revising paragraph (a)(1)(ii) and adding paragraph (a)(1)(iii);

■ b. Removing and reserving paragraph (a)(2);

■ c. Revising paragraphs (b)(1)(i) and (ii);

■ d. Removing paragraph (b)(2);

■ e. Redesignating paragraphs (b)(3) and (4) as (b)(2) and (3);

■ f. Revising newly designated paragraph (b)(3); and

■ g. Revising paragraph (d).

The revisions read as follows:

§ 60.62 Standards.

(a) * * *

(1) * * *

(ii) 0.02 pound per ton of clinker if construction or reconstruction of the kiln commenced after June 16, 2008.

(iii) Kilns that have undergone a modification may not discharge into the atmosphere any gases which contain PM in excess of 0.07 pound per ton of clinker.

* * * * *

(b) * * *

(1) * * *

(i) 0.02 pound per ton of clinker if construction or reconstruction of the clinker cooler commences after June 16, 2008.

(ii) 0.07 pound per ton of clinker if the clinker cooler has undergone a modification.

* * * * *

(3) If the kiln has a separated alkali bypass stack and/or an inline coal mill with a separate stack, you must combine the PM emissions from the bypass stack and/or the inline coal mill stack with the PM emissions from the main kiln exhaust to determine total PM emissions.

* * * * *

(d) If you have an affected source subject to this subpart with a different emissions limit or requirement for the same pollutant under another regulation in title 40 of this chapter, you must comply with the most stringent emissions limit or requirement and are not subject to the less stringent requirement.

■ 4. Section 60.63 is amended by:

■ a. Revising paragraphs (b)(1)(i) and (ii);

■ b. Adding paragraph (b)(1)(iii);

■ c. Revising paragraphs (b)(2) and (3);

■ d. Removing paragraph (b)(4);

■ e. Revising paragraphs (c) through (f);

■ f. Revising paragraph (g) introductory text;

■ g. Revising paragraph (g)(2);

■ h. Revising paragraph (h) introductory text;

■ i. Revising paragraphs (h)(1) and (6);

■ j. Revising paragraph (h)(7) introductory text;

■ k. Revising paragraph (h)(8) introductory text;

■ l. Revising paragraph (h)(9);

■ m. Revising paragraph (i) introductory text; and

■ n. Revising paragraph (i)(1) introductory text and (i)(1)(i).

The revisions and addition read as follows:

§ 60.63 Monitoring of operations.

* * * * *

(b) * * *

(1) * * *

(i) Install, calibrate, maintain, and operate a 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 must be maintained within ±5 percent accuracy or

(ii) Install, calibrate, maintain, and operate a permanent weigh scale system to measure and record weight rates of the amount of feed to the kiln in tons of mass per hour. The system of measuring feed must be maintained within ±5 percent accuracy. Calculate your hourly clinker production rate using a kiln specific feed-to-clinker ratio based on reconciled clinker production rates determined for accounting purposes and recorded feed rates. This ratio should be updated monthly. Note that if this ratio changes at clinker reconciliation, you must use the new ratio going forward, but you do not have to retroactively change clinker production rates previously estimated.

(iii) For each kiln operating hour for which you do not have data on clinker production or the amount of feed to the kiln, use the value from the most recent previous hour for which valid data are available.

(2) Determine, record, and maintain a record of the accuracy of the system of measuring hourly clinker production rates or feed rates before initial use (for new sources) or by the effective compliance date of this rule (for existing sources). During each quarter of source operation, you must determine, record, and maintain a record of the ongoing accuracy of the system of measuring hourly clinker production rates or feed rates.

(3) If you measure clinker production directly, record the daily clinker production rates; if you measure the kiln feed rates and calculate clinker production, record the daily kiln feed and clinker production rates.

(c) *PM Emissions Monitoring Requirements.* (1) For each kiln or clinker cooler subject to a PM emissions limit in § 60.62, you must demonstrate compliance through an initial performance test. You will conduct your performance test using Method 5 or Method 5I at appendix A–3 to part 60 of this chapter. You must also monitor continuous performance through use of a PM continuous parametric monitoring system (PM CPMS).

(2) For your PM CPMS, you will establish a site-specific operating limit. If your PM performance test demonstrates your PM emission levels to be below 75 percent of your emission limit you will use the average PM CPMS value recorded during the PM compliance test, the milliamp equivalent of zero output from your PM CPMS, and the average PM result of your compliance test to establish your operating limit equivalent to 75 percent of the standard. If your PM compliance test demonstrates your PM emission levels to be at or above 75 percent of your emission limit you will use the average PM CPMS value recorded during the PM compliance test demonstrating compliance with the PM limit to establish your operating limit. You will use the PM CPMS to demonstrate continuous compliance with your operating limit. You must repeat the performance test annually and reassess and adjust the site-specific operating limit in accordance with the results of the performance test.

(i) Your PM CPMS must provide a 4–20 milliamp output and the establishment of its relationship to manual reference method measurements must be determined in units of milliamps.

(ii) Your PM CPMS operating range must be capable of reading PM concentrations from zero to a level equivalent to two times your allowable emission limit. If your PM CPMS is an auto-ranging instrument capable of multiple scales, the primary range of the instrument must be capable of reading PM concentration from zero to a level equivalent to two times your allowable emission limit.

(iii) During the initial performance test or any such subsequent performance test that demonstrates compliance with the PM limit, record and average all milliamp output values from the PM CPMS for the periods corresponding to the compliance test runs (e.g., average all your PM CPMS output values for three corresponding 2-hour Method 5I test runs).

(3) Determine your operating limit as specified in paragraphs (c)(4)(i) through (c)(5) of this section. If your PM performance test demonstrates your PM emission levels to be below 75 percent of your emission limit you will use the average PM CPMS value recorded during the PM compliance test, the milliamp equivalent of zero output from your PM CPMS, and the average PM result of your compliance test to establish your operating limit. If your PM compliance test demonstrates your PM emission levels to be at or above 75 percent of your emission limit you will use the average PM CPMS value recorded during the PM compliance test to establish your operating limit. You must verify an existing or establish a new operating limit after each repeated performance test. You must repeat the performance test at least annually and reassess and adjust the site-specific operating limit in accordance with the results of the performance test.

(4) If the average of your three Method 5 or 5I compliance test runs are below 75 percent of your PM emission limit, you must calculate an operating limit by establishing a relationship of PM CPMS signal to PM concentration using the PM CPMS instrument zero, the average PM CPMS values corresponding to the three compliance test runs, and the average PM concentration from the Method 5 or 5I compliance test with the procedures in (c)(4)(i)(A) through (D) of this section.

(i) Determine your PM CPMS instrument zero output with one of the following procedures.

(A) Zero point data for in-situ instruments should be obtained by removing the instrument from the stack and monitoring ambient air on a test bench.

(B) Zero point data for extractive instruments should be obtained by removing the extractive probe from the stack and drawing in clean ambient air.

(C) The zero point can also can be obtained by performing manual reference method measurements when the flue gas is free of PM emissions or contains very low PM concentrations (e.g., when your process is not operating, but the fans are operating or your source is combusting only natural gas) and plotting these with the compliance data to find the zero intercept.

(D) If none of the steps in paragraphs (c)(4)(i)(A) through (C) of this section are possible, you must use a zero output value provided by the manufacturer.

(ii) Determine your PM CPMS instrument average in milliamps, and the average of your corresponding three PM compliance test runs, using equation 1.

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} X_1 , \bar{y} = \frac{1}{n}\sum_{i=1}^{n} Y_1 \qquad \text{(Eq. 1)}$$

Where:

X1 = The PM CPMS data points for the three runs constituting the performance test,
Y1 = The PM concentration value for the three runs constituting the performance test, and
n = The number of data points.

(iii) With your PM CPMS instrument zero expressed in milliamps, your three run average PM CPMS milliamp value, and your three run average PM concentration from your three PM performance test runs, determine a relationship of lb/ton-clinker per milliamp with equation 2.

$$R = \frac{Y_1}{(X_1 - z)} \qquad \text{(Eq. 2)}$$

Where:

R = The relative lb/ton clinker per milliamp for your PM CPMS.
Y1 = The three run average PM lb/ton clinker.
X1 = The three run average milliamp output from you PM CPMS.
z = the milliamp equivalent of your instrument zero determined from (c)(4)(i) of this section.

(iv) Determine your source specific 30-day rolling average operating limit using the lb/ton-clinker per milliamp value from Equation 2 above in Equation 3, below. This sets your operating limit at the PM CPMS output value corresponding to 75 percent of your emission limit.

$$O_1 = z + (0.75(L)) / R \qquad \text{(Eq. 3)}$$

Where:

O_l = The operating limit for your PM CPMS on a 30-day rolling average, in milliamps.

L = Your source emission limit expressed in lb/ton clinker.

z = Your instrument zero in milliamps, determined from (1)(i).

R = The relative lb/ton-clinker per milliamp for your PM CPMS, from Equation 2.

(5) If the average of your three PM compliance test runs is at or above 75 percent of your PM emission limit you must determine your operating limit by averaging the PM CPMS milliamp output corresponding to your three PM performance test runs that demonstrate compliance with the emission limit using Equation 4.

$$O_h = \frac{1}{n}\sum_{i=1}^{n} X_1 \qquad \text{(Eq. 4)}$$

Where:

X1 = The PM CPMS data points for all runs i.

n = The number of data points.

O_h = Your site specific operating limit, in milliamps.

(6) To determine continuous compliance, you must record the PM CPMS output data for all periods when the process is operating, and use all the PM CPMS data for calculations when the source is not out-of-control. You must demonstrate continuous compliance by using all quality-assured hourly average data collected by the PM CPMS for all operating hours to calculate the arithmetic average operating parameter in units of the operating limit (milliamps) on a 30 operating day rolling average basis, updated at the end of each new kiln operating day. Use Equation 5 to determine the 30 kiln operating day average.

$$\text{30kiln operating day average} = \frac{\sum_{i=1}^{n} Hpv_i}{n} \qquad \text{(Eq. 5)}$$

Where:

Hpvi = The hourly parameter value for hour i.

n = The number of valid hourly parameter values collected over 30 kiln operating days.

(7) Use EPA Method 5 or Method 5I of appendix A to part 60 of this chapter to determine PM emissions. For each performance test, conduct at least three separate runs under the conditions that exist when the affected source is operating at the highest load or capacity level reasonably expected to occur. Conduct each test run to collect a minimum sample volume of 2 dscm for determining compliance with a new source limit and 1 dscm for determining compliance with an existing source limit. Calculate the average of the results from three consecutive runs to determine compliance. You need not determine the particulate matter collected in the impingers (''back half'') of the Method 5 or Method 5I particulate sampling train to demonstrate compliance with the PM standards of this subpart. This shall not preclude the permitting authority from requiring a determination of the ''back half'' for other purposes.

(8) For PM performance test reports used to set a PM CPMS operating limit, the electronic submission of the test report must also include the make and model of the PM CPMS instrument, serial number of the instrument, analytical principle of the instrument (e.g. beta attenuation), span of the instruments primary analytical range, milliamp value equivalent to the instrument zero output, technique by which this zero value was determined, and the average milliamp signals corresponding to each PM compliance test run.

(d) You must install, operate, calibrate, and maintain a CEMS continuously monitoring and recording the concentration by volume of NO_X emissions into the atmosphere for any kiln subject to the NO_X emissions limit in § 60.62(a)(3). If the kiln has an alkali bypass, NO_X emissions from the alkali bypass do not need to be monitored, and NO_X emission monitoring of the kiln exhaust may be done upstream of any commingled alkali bypass gases.

(e) You must install, operate, calibrate, and maintain a CEMS for continuously monitoring and recording the concentration by volume of SO_2 emissions into the atmosphere for any kiln subject to the SO_2 emissions limit in § 60.62(a)(4). If you are complying with the alternative 90 percent SO_2 emissions reduction emissions limit, you must also continuously monitor and record the concentration by volume of SO_2 present at the wet scrubber inlet.

(f) The NO_X and SO_2 CEMS required under paragraphs (d) and (e) of this section must be installed, operated and maintained according to Performance Specification 2 of appendix B of this part and the requirements in paragraphs (f)(1) through (5) of this section.

(1) The span value of each NO_X CEMS monitor must be set at 125 percent of the maximum estimated hourly potential NO_X emission concentration that translates to the applicable emissions limit at full clinker production capacity.

(2) You must conduct performance evaluations of each NO_X CEMS monitor according to the requirements in § 60.13(c) and Performance Specification 2 of appendix B to this part. You must use Methods 7, 7A, 7C, 7D, or 7E of appendix A–4 to this part for conducting the relative accuracy evaluations. The method ASME PTC 19.10–1981, ''Flue and Exhaust Gas Analyses,'' (incorporated by reference—see § 60.17) is an acceptable alternative to Method 7 or 7C of appendix A–4 to this part.

(3) The span value for the SO_2 CEMS monitor is the SO_2 emission concentration that corresponds to 125 percent of the applicable emissions limit at full clinker production capacity

and the expected maximum fuel sulfur content.

(4) You must conduct performance evaluations of each SO_2 CEMS monitor according to the requirements in § 60.13(c) and Performance Specification 2 of appendix B to this part. You must use Methods 6, 6A, or 6C of appendix A–4 to this part for conducting the relative accuracy evaluations. The method ASME PTC 19.10–1981, ''Flue and Exhaust Gas Analyses,'' (incorporated by reference—see § 60.17) is an acceptable alternative to Method 6 or 6A of appendix A–4 to this part.

(5) You must comply with the quality assurance requirements in Procedure 1 of appendix F to this part for each NO_X and SO_2 CEMS, including quarterly accuracy determinations for monitors, and daily calibration drift tests.

(g) For each CPMS or CEMS required under paragraphs (c) through (e) of this section:

* * * * *

(2) You may not use data recorded during the monitoring system malfunctions, repairs associated with monitoring system malfunctions, or required monitoring system quality assurance or control activities in calculations used to report emissions or operating levels. A monitoring system malfunction is any sudden, infrequent, not reasonably preventable failure of the monitoring system to provide valid data. Monitoring system failures that are caused in part by poor maintenance or careless operation are not malfunctions. An owner or operator must use all the data collected during all other periods in reporting emissions or operating levels.

* * * * *

(h) You must install, operate, calibrate, and maintain instruments for continuously measuring and recording the stack gas flow rate to allow determination of the pollutant mass emissions rate to the atmosphere for each kiln subject to the PM emissions limits in § 60.62(a)(1)(ii) and (iii) and (b)(1)(i) and (ii), the NO_X emissions limit in § 60.62(a)(3), or the SO_2 emissions limit in § 60.62(a)(4) according to the requirements in paragraphs (h)(1) through (10), where appropriate, of this section.

(1) The owner or operator must install each sensor of the flow rate monitoring system in a location that provides representative measurement of the exhaust gas flow rate at the sampling location of the NO_X and/or SO_2 CEMS, taking into account the manufacturer's recommendations. The flow rate sensor is that portion of the system that senses the volumetric flow rate and generates an output proportional to that flow rate.

* * * * *

(6) The flow rate monitoring system must be designed to measure a minimum of one cycle of operational flow for each successive 15-minute period.

(7) The flow rate sensor must be able to determine the daily zero and upscale calibration drift (CD) (see sections 3.1 and 8.3 of Performance Specification 2 in appendix B to this part for a discussion of CD).

* * * * *

(8) You must perform an initial relative accuracy test of the flow rate monitoring system according to section 8.2 of Performance Specification 6 of appendix B to this part, with the exceptions noted in paragraphs (h)(8)(i) and (ii) of this section.

* * * * *

(9) You must verify the accuracy of the flow rate monitoring system at least once per year by repeating the relative accuracy test specified in paragraph (h)(8) of this section.

* * * * *

(i) *Development and Submittal (Upon Request) of Monitoring Plans.* To demonstrate compliance with any applicable emissions limit through performance stack testing or other emissions monitoring (including PM CPMS), you must develop a site-specific monitoring plan according to the requirements in paragraphs (i)(1) through (4) of this section. This requirement also applies to you if you petition the EPA Administrator for alternative monitoring parameters under § 60.13(3)(i). If you use a bag leak detector system (BLDS), you must also meet the requirements specified in paragraph § 63.1350(m)(10) of this chapter.

(1) For each continuous monitoring system (CMS) required in this section, you must develop, and submit to the permitting authority for approval upon request, a site-specific monitoring plan that addresses paragraphs (i)(1)(i) through (iii) of this section. You must submit this site-specific monitoring plan, if requested, at least 30 days before the initial performance evaluation of your CMS.

(i) Installation of the CMS sampling probe or other interface at a measurement location relative to each affected process unit such that the measurement is representative of control of the exhaust emissions (e.g., on or downstream of the last control device);

* * * * *

■ 5. Section 60.64 is revised to read as follows:

§ 60.64 Test methods and procedures.

(a) In conducting the performance tests and relative accuracy tests required in § 60.8, you must use reference methods and procedures and the test methods in appendix A of this part or other methods and procedures as specified in this section, except as provided in § 60.8(b).

(b)(1)You must demonstrate compliance with the PM standards in § 60.62 using EPA method 5 or method 5I.

(2) Use Method 9 and the procedures in § 60.11 to determine opacity.

(3) Any sources other than kilns (including associated alkali bypass and clinker cooler) that are subject to the 10 percent opacity limit must follow the appropriate monitoring procedures in § 63.1350(f), (m)(1)through (4), (10) and (11), (o), and (p) of this chapter.

(c) Calculate and record the rolling 30 kiln operating day average emission rate daily of NO_X and SO_2 according to the procedures in paragraphs (c)(1) and (2) of this section.

(1) Calculate the rolling 30 kiln operating day average emissions according to equation 6:

$$E_{30D} = k \frac{\sum_{i=1}^{n} C_i Q_i}{P} \qquad \text{(Eq. 6)}$$

Where:

E_{30D} = 30 kiln operating day average emission rate of NO_X or SO_2, lb/ton of clinker.
C_i = Concentration of NO_X or SO_2 for hour i, ppm.
Q_i = Volumetric flow rate of effluent gas for hour i, where
C_i and Q_i are on the same basis (either wet or dry), scf/hr.
P = 30 days of clinker production during the same time period as the NO_X or SO_2 emissions measured, tons.
k = Conversion factor, 1.194×10^{7} for NO_X and 1.660×10^{7} for SO_2, lb/scf/ppm.
n = Number of kiln operating hours over 30 kiln operating days.

(2) For each kiln operating hour for which you do not have at least one valid 15-minute CEMS data value, use the average emissions rate (lb/hr) from the most recent previous hour for which valid data are available.

(d)(1) Within 60 days after the date of completing each performance test (see § 60.8) as required by this subpart you must submit the results of the performance tests conducted to demonstrate compliance under this subpart to the EPA's WebFIRE database by using the Compliance and Emissions Data Reporting Interface (CEDRI) that is accessed through the EPA's Central Data Exchange (CDX) (*http://www.epa.gov/cdx*). Performance test data must be submitted in the file format generated through use of the EPA's Electronic Reporting Tool (ERT) (see *http://www.epa.gov/ttn/chief/ert/index.html*). Only data collected using test methods on the ERT Web site are subject to this requirement for submitting reports electronically to WebFIRE. Owners or operators who claim that some of the information being submitted for performance tests is confidential business information (CBI) must submit a complete ERT file including information claimed to be CBI on a compact disk, flash drive or other commonly used electronic storage media to the EPA. The electronic media must be clearly marked as CBI and mailed to U.S. EPA/OAPQS/CORE CBI Office, Attention: WebFIRE Administrator, MD C404–02, 4930 Old Page Rd., Durham, NC 27703. The same ERT file with the CBI omitted must be submitted to the EPA via CDX as described earlier in this paragraph. At the discretion of the delegated authority, you must also submit these reports, including the CBI, to the delegated authority in the format specified by the delegated authority. For any performance test conducted using test methods that are not listed on the ERT Web site, you must submit the results of the performance test to the Administrator at the appropriate address listed in § 63.13.

(2) Within 60 days after the date of completing each CEMS performance evaluation test as defined in § 63.2, you must submit relative accuracy test audit (RATA) data to the EPA's CDX by using CEDRI in accordance with paragraph (d)(1) of this section. Only RATA pollutants that can be documented with the ERT (as listed on the ERT Web site) are subject to this requirement. For any performance evaluations with no corresponding RATA pollutants listed on the ERT Web site, you must submit the results of the performance evaluation to the Administrator at the appropriate address listed in § 63.13.

(3) For PM performance test reports used to set a PM CPMS operating limit, the electronic submission of the test report must also include the make and model of the PM CPMS instrument, serial number of the instrument, analytical principle of the instrument (e.g. beta attenuation), span of the instruments primary analytical range, milliamp value equivalent to the instrument zero output, technique by which this zero value was determined, and the average milliamp signals corresponding to each PM compliance test run.

(4) All reports required by this subpart not subject to the requirements in paragraphs (d)(1) and (2) of this section must be sent to the Administrator at the appropriate address listed in § 63.13. The Administrator or the delegated authority may request a report in any form suitable for the specific case (e.g., by commonly used electronic media such as Excel spreadsheet, on CD or hard copy). The Administrator retains the right to require submittal of reports subject to paragraph (d)(1) and (2) of this section in paper format.

■ 6. Section 60.65 is revised to read as follows:

§ 60.65 Recordkeeping and reporting requirements.

(a) Each owner or operator required to install a CPMS or CEMS under sections § 60.63(c) through (e) shall submit reports of excess emissions. The content of these reports must comply with the requirements in § 60.7(c). Notwithstanding the provisions of § 60.7(c), such reports shall be submitted semiannually.

(b) Each owner or operator of facilities subject to the provisions of § 60.63(c) through (e) shall submit semiannual reports of the malfunction information required to be recorded by § 60.7(b). These reports shall include the frequency, duration, and cause of any incident resulting in deenergization of any device controlling kiln emissions or in the venting of emissions directly to the atmosphere.

(c) The requirements of this section remain in force until and unless the Agency, in delegating enforcement authority to a State under section 111(c) of the Clean Air Act, 42 U.S.C. 7411, approves reporting requirements or an alternative means of compliance surveillance adopted by such States. In that event, affected sources within the State will be relieved of the obligation to comply with this section, provided that they comply with the requirements established by the State.

■ 7. Section 60.66 is amended by revising paragraph (b) introductory text to read as follows:

§ 60.66 Delegation of authority.

* * * * *

(b) In delegating implementation and enforcement authority to a State, local, or tribal agency, the approval authorities contained in paragraphs (b)(1) through (4) of this section are retained by the Administrator of the U.S EPA and are not transferred to the State, local, or tribal agency.

* * * * *

PART 63—NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR SOURCE CATEGORIES

■ 8. The authority citation for part 63 continues to read as follows:

Authority: 42 U.S.C. 7401, *et seq.*

Subpart LLL—[Amended]

■ 9. Section 63.1340 is amended by revising paragraphs (b)(1), (b)(6) through (9), and (c) to read as follows:

§ 63.1340 What parts of my plant does this subpart cover?

* * * * *

(b) * * *:

(1) Each kiln including alkali bypasses and inline coal mills, except for kilns that burn hazardous waste and are subject to and regulated under subpart EEE of this part;

* * * * *

(6) Each raw material, clinker, or finished product storage bin at any portland cement plant that is a major source;

(7) Each conveying system transfer point including those associated with coal preparation used to convey coal from the mill to the kiln at any portland cement plant that is a major source;

(8) Each bagging and bulk loading and unloading system at any portland cement plant that is a major source; and

(9) Each open clinker storage pile at any portland cement plant.

(c) Onsite sources that are subject to standards for nonmetallic mineral processing plants in subpart OOO, part 60 of this chapter are not subject to this subpart. Crushers are not covered by this subpart regardless of their location.

* * * * *

■ 10. Section 63.1341 is amended by:

■ a. Removing definitions of ''Enclosed storage pile,'' and ''Inactive clinker pile'';

■ b. Adding a definition for ''In-line coal mill,'' ''Open clinker storage pile,'' ''Startup,'' and ''Shutdown'' in alphabetical order; and

■ c. Revising definitions for ''Kiln,'' ''New source,'' ''Operating day,'' ''Raw material dryer,'' and ''Total organic HAP,''.

The additions and revisions read as follows:

§ 63.1341 Definitions.

* * * * *

In-line coal mill means those coal mills using kiln exhaust gases in their process. Coal mills with a heat source other than the kiln or coal mills using exhaust gases from the clinker cooler are not an in-line coal mill.

* * * * *

Kiln means a device, including any associated preheater or precalciner devices, inline raw mills, inline coal mills or alkali bypasses that produces clinker by heating limestone and other materials for subsequent production of portland cement. Because the inline raw mill and inline coal mill are considered an integral part of the kiln, for purposes of determining the appropriate emissions limit, the term kiln also applies to the exhaust of the inline raw mill and the inline coal mill.

* * * * *

New source means any source that commenced construction or reconstruction after May 6, 2009, for purposes of determining the applicability of the kiln, clinker cooler and raw material dryer emissions limits for mercury, PM, THC, and HCl.

* * * * *

Open clinker storage pile means a clinker storage pile on the ground for more than three days that is not completely enclosed in a building or structure.

Operating day means any 24-hour period beginning at 12:00 midnight during which the kiln operates for any time. For calculating the rolling 30-day average emissions, kiln operating days do not include the hours of operation during startup or shutdown.

* * * * *

Raw material dryer means an impact dryer, drum dryer, paddle-equipped rapid dryer, air separator, or other equipment used to reduce the moisture content of feed or other materials.

* * * * *

Shutdown means the cessation of kiln operation. Shutdown begins when feed to the kiln is halted and ends when continuous kiln rotation ceases.

* * * * *

Startup means the time from when a shutdown kiln first begins firing fuel until it begins producing clinker. Startup begins when a shutdown kiln turns on the induced draft fan and begins firing fuel in the main burner. Startup ends when feed is being continuously introduced into the kiln for at least 120 minutes or when the feed rate exceeds 60 percent of the kiln design limitation rate, whichever occurs first.

* * * * *

Total organic HAP means, for the purposes of this subpart, the sum of the concentrations of compounds of formaldehyde, benzene, toluene, styrene, m-xylene, p-xylene, o-xylene, acetaldehyde, and naphthalene as measured by EPA Test Method 320 or Method 18 of appendix A to this part or ASTM D6348–03[1] or a combination of these methods, as appropriate. If measurement results for any pollutant are reported as below the method detection level (e.g., laboratory analytical results for one or more sample components are below the method defined analytical detection level), you must use the method detection level as the measured emissions level for that pollutant in calculating the total organic HAP value. The measured result for a multiple component analysis (e.g., analytical values for multiple Method 18 fractions) may include a combination of method detection level data and analytical data reported above the method detection level. The owner or operator of an affected source may request the use of other test methods to make this determination under paragraphs 63.7(e)(2)(ii) and (f) of this part.

* * * * *

■ 11. Section 63.1343 is revised to read as follows:

§ 63.1343 What standards apply to my kilns, clinker coolers, raw material dryers, and open clinker storage piles?

(a) *General.* The provisions in this section apply to each kiln and any alkali bypass associated with that kiln, clinker cooler, raw material dryer, and open clinker storage pile. All D/F, HCl, and total hydrocarbon (THC) emissions limit are on a dry basis. The D/F, HCl, and THC limits for kilns are corrected to 7 percent oxygen. All THC emissions limits are measured as propane. Standards for mercury and THC are based on a rolling 30-day average. If using a CEMS to determine compliance with the HCl standard, this standard is based on a rolling 30-day average. You must ensure appropriate corrections for moisture are made when measuring flow rates used to calculate mercury emissions. The 30-day period means 30 consecutive kiln operating days excluding periods of startup and shutdown. All emissions limits for kilns, clinker coolers, and raw material dryers currently in effect that are superseded by the limits below continue to apply until the compliance date of the limits below, or until the source certifies compliance with the limits below, whichever is earlier.

(b) *Kilns, clinker coolers, raw material dryers, raw mills, and finish mills.* (1) The emissions limits for these sources are shown in Table 1 below. PM limits for existing kilns also apply to kilns that have undergone a modification as defined in subpart A of part 60 of title 40.

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[1] When using ASTM D6348–03, the following conditions must be met:

(1) The test plan preparation and implementation in the Annexes to ASTM D6348–03, Sections A1 through A8 are mandatory; (2) For ASTM D6348–03 Annex A5 (Analyte Spiking Technique), the percent R must be determined for each target analyte (see Equation A5.5); (3) For the ASTM D6348–03 test data to be acceptable for a target analyte percent R must be 70 percent $\geq R \leq$ 130 percent; and (4) The percent R value for each compound must be reported in the test report and all field measurements corrected with the calculated percent R value for that compound using the following equation: Reported Result = The measured concentration in the stack divided by the calculated percent R value and then the whole term multiplied by 100.

TABLE 1—EMISSIONS LIMITS FOR KILNS, CLINKER COOLERS, RAW MATERIAL DRYERS, RAW AND FINISH MILLS

	If your source is a (an):	And the operating mode is:	And if is located at a:	Your emissions limits are:	And the units of the emissions limit are:	The oxygen correction factor is:
1.	Existing kiln	Normal operation	Major or area source	PM[1] 0.07 D/F[2] 0.2 Mercury 55 THC[3,4] 24	lb/ton clinker ng/dscm (TEQ) lb/MM tons clinker ppmvd	NA. 7 percent. NA. 7 percent.
2.	Existing kiln	Normal operation	Major source	HCl 3	ppmvd	7 percent.
3.	Existing kiln	Startup and shutdown.	Major or area source	Work practices (63.1346(f))	NA	NA.
4.	New kiln	Normal operation	Major or area source	PM 0.02 D/F[2] 0.2 Mercury 21 THC[3,4] 24	lb/ton clinker ng/dscm (TEQ) lb/MM tons clinker ppmvd	NA. 7 percent. NA 7 percent.
5.	New kiln	Normal operation	Major source	HCl 3	ppmvd	7 percent.
6.	New kiln	Startup and shutdown.	Major or area source	Work practices (63.1346(f))	NA	NA.
7.	Existing clinker cooler.	Normal operation	Major or area source	PM 0.07	lb/ton clinker	NA.
8.	Existing clinker cooler.	Startup and shutdown.	Major or area source	Work practices (63.1348(b)(9))	NA	NA.
9.	New clinker cooler	Normal operation	Major or area source	PM 0.02	lb/ton clinker	NA.
10.	New clinker cooler	Startup and shutdown.	Major or area source	Work practices (63.1348(b)(9))	NA	NA.
11.	Existing or new raw material dryer.	Normal operation	Major or area source	THC[3,4] 24	ppmvd	NA.
12.	Existing or new raw material dryer.	Startup and shutdown.	Major or area source	Work practices (63.1348(b)(9))	NA	NA.
13.	Existing or new raw or finish mill.	All operating modes	Major source	Opacity 10	percent	NA.

[1] The initial and subsequent PM performance tests are performed using Method 5 or 5I and consist of three 1-hr tests.

[2] If the average temperature at the inlet to the first PM control device (fabric filter or electrostatic precipitator) during the D/F performance test is 400 °F or less this limit is changed to 0.40 ng/dscm (TEQ).

[3] Measured as propane.

[4] Any source subject to the 24 ppmvd THC limit may elect to meet an alternative limit of 12 ppmvd for total organic HAP.

(2) When there is an alkali bypass and/or an inline coal mill with a separate stack associated with a kiln, the combined PM emissions from the kiln and the alkali bypass stack and/or the inline coal mill stack are subject to the PM emissions limit. Existing kilns that combine the clinker cooler exhaust and/or coal mill exhaust with the kiln exhaust and send the combined exhaust to the PM control device as a single stream may meet an alternative PM emissions limit. This limit is calculated using Equation 1 of this section:

$$PM_{alt} = (0.0060 \times 1.65)(Q_k + Q_c + Q_{ab} + Q_{cm})/(7000) \quad \text{(Eq. 1)}$$

Where:

PM_{alt} = Alternative PM emission limit for commingled sources.

0.006 = The PM exhaust concentration (gr/dscf) equivalent to 0.070 lb per ton clinker where clinker cooler and kiln exhaust gas are not combined.

1.65 = The conversion factor of ton feed per ton clinker.

Q_k = The exhaust flow of the kiln (dscf/ton feed).

Q_c = The exhaust flow of the clinker cooler (dscf/ton feed).

Q_{ab} = The exhaust flow of the alkali bypass (dscf/ton feed).

Q_{cm} = The exhaust flow of the coal mill (dscf/ton feed).

7000 = The conversion factor for grains (gr) per lb.

For new kilns that combine kiln exhaust and clinker cooler gas the limit is calculated using the Equation 2 of this section:

$$PM_{alt} = (0.0020 \times 1.65)(Q_k + Q_c + Q_{ab} + Q_{cm})/(7000) \quad \text{(Eq. 2)}$$

Where:

PM_{alt} = Alternative PM emission limit for commingled sources.

0.002 = The PM exhaust concentration (gr/dscf) equivalent to 0.020 lb per ton clinker where clinker cooler and kiln exhaust gas are not combined.

1.65 = The conversion factor of ton feed per ton clinker.

Q_k = The exhaust flow of the kiln (dscf/ton feed).

Q_c = The exhaust flow of the clinker cooler (dscf/ton feed).

Q_{ab} = The exhaust flow of the alkali bypass (dscf/ton feed).

Q_{cm} = The exhaust flow of the coal mill (dscf/ton feed).

7000 = The conversion factor for gr per lb.

(c) *Open clinker storage pile.* The owner or operator of an open clinker storage pile must prepare, and operate in accordance with, the fugitive dust emissions control measures, described in their operation and maintenance plan (see § 63.1347 of this subpart), that is appropriate for the site conditions as specified in paragraphs (c)(1) through

(3) of this section. The operation and maintenance plan must also describe the measures that will be used to minimize fugitive dust emissions from piles of clinker, such as accidental spillage, that are not part of open clinker storage piles.

(1) The operation and maintenance plan must identify and describe the location of each current or future open clinker storage pile and the fugitive dust emissions control measures the owner or operator will use to minimize fugitive dust emissions from each open clinker storage pile.

(2) For open clinker storage piles, the operations and maintenance plan must specify that one or more of the following control measures will be used to minimize to the greatest extent practicable fugitive dust from open clinker storage piles: Locating the source inside a partial enclosure, installing and operating a water spray or fogging system, applying appropriate chemical dust suppression agents, use of a wind barrier, compaction, use of tarpaulin or other equally effective cover or use of a vegetative cover. You must select, for inclusion in the operations and maintenance plan, the fugitive dust control measure or measures listed in this paragraph that are most appropriate for site conditions. The plan must also explain how the measure or measures selected are applicable and appropriate for site conditions. In addition, the plan must be revised as needed to reflect any changing conditions at the source.

(3) Temporary piles of clinker that result from accidental spillage or clinker storage cleaning operations must be cleaned up within 3 days.

(d) Emission limits in effect prior to September 9, 2010. Any source defined as an existing source in § 63.1351, and that was subject to a PM, mercury, THC, D/F, or opacity emissions limit prior to September 9, 2010, must continue to meet the limits shown in Table 2 to this section until September 9, 2015.

■ 12. Section 63.1344 is revised to read as follows:

§ 63.1344 Affirmative Defense for Violation of Emission Standards During Malfunction.

In response to an action to enforce the standards set forth in § 63.1343(b) and (c) and § 63.1345 and you may assert an affirmative defense to a claim for civil penalties for violations of such standards that are caused by malfunction, as defined at 40 CFR 63.2. Appropriate penalties may be assessed if you fail to meet your burden of proving all of the requirements in the affirmative defense. The affirmative defense shall not be available for claims for injunctive relief.

(a) *Assertion of affirmative defense.* To establish the affirmative defense in any action to enforce such a standard, you must timely meet the reporting requirements in paragraph (b) of this section, and must prove by a preponderance of evidence that:

(1) The violation:

(i) Was caused by a sudden, infrequent, and unavoidable failure of air pollution control equipment, process equipment, or a process to operate in a normal or usual manner; and

(ii) Could not have been prevented through careful planning, proper design or better operation and maintenance practices; and

(iii) Did not stem from any activity or event that could have been foreseen and avoided, or planned for; and

(iv) Was not part of a recurring pattern indicative of inadequate design, operation, or maintenance; and

(2) Repairs were made as expeditiously as possible when a violation occurred; and

(3) The frequency, amount, and duration of the violation (including any bypass) were minimized to the maximum extent practicable; and

(4) If the violation resulted from a bypass of control equipment or a process, then the bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; and

(5) All possible steps were taken to minimize the impact of the violation on ambient air quality, the environment, and human health; and

(6) All emissions monitoring and control systems were kept in operation if at all possible, consistent with safety and good air pollution control practices; and

(7) All of the actions in response to the violation were documented by properly signed, contemporaneous operating logs; and

(8) At all times, the affected source was operated in a manner consistent with good practices for minimizing emissions; and

(9) A written root cause analysis has been prepared, the purpose of which is to determine, correct, and eliminate the primary causes of the malfunction and the violation resulting from the malfunction event at issue. The analysis shall also specify, using best monitoring methods and engineering judgment, the amount of any emissions that were the result of the malfunction.

(b) *Report.* The owner or operator seeking to assert an affirmative defense shall submit a written report to the Administrator with all necessary supporting documentation, that it has met the requirements set forth in paragraph (a) of this section. This affirmative defense report shall be included in the first periodic compliance, deviation report or excess emission report otherwise required after the initial occurrence of the violation of the relevant standard (which may be the end of any applicable averaging period). If such compliance, deviation report or excess emission report is due less than 45 days after the initial occurrence of the violation, the affirmative defense report may be included in the second compliance, deviation report or excess emission report due after the initial occurrence of the violation of the relevant standard.

■ 13. Section 63.1345 is revised to read as follows:

§ 63.1345 Emissions limits for affected sources other than kilns; clinker coolers; new and reconstructed raw material dryers.

The owner or operator of each new or existing raw material, clinker, or finished product storage bin; conveying system transfer point; bagging system; bulk loading or unloading system; raw and finish mills; and each existing raw material dryer, at a facility which is a major source subject to the provisions of this subpart must not cause to be discharged any gases from these affected sources which exhibit opacity in excess of 10 percent.

■ 14. Section 63.1346 is amended by:

■ a. Revising paragraph (a) introductory text;

■ b. Revising paragraph (a)(1);

■ c. Revising paragraphs (c) through (f); and

■ d. Adding paragraph (g)

The revisions read as follows:

§ 63.1346 Operating limits for kilns.

(a) The owner or operator of a kiln subject to a D/F emissions limitation under § 63.1343 must operate the kiln such that the temperature of the gas at the inlet to the kiln PM control device (PMCD) and alkali bypass PMCD, if applicable, does not exceed the applicable temperature limit specified in paragraph (b) of this section. The owner or operator of an in-line kiln/raw mill subject to a D/F emissions limitation under § 63.1343 must operate the in-line kiln/raw mill, such that:

(1) When the raw mill of the in-line kiln/raw mill is operating, the applicable temperature limit for the main in-line kiln/raw mill exhaust, specified in paragraph (b) of this section and established during the performance test when the raw mill was operating, is not exceeded, except during periods of startup and shutdown when the

temperature limit may be exceeded by no more than 10 percent.

* * * * *

(c) For an affected source subject to a D/F emissions limitation under § 63.1343 that employs sorbent injection as an emission control technique for D/F control, you must operate the sorbent injection system in accordance with paragraphs (c)(1) and (2) of this section.

(1) The rolling three-hour average activated sorbent injection rate must be equal to or greater than the sorbent injection rate determined in accordance with § 63.1349(b)(3)(vi).

(2) You must either:

(i) Maintain the minimum activated carbon injection carrier gas flow rate, as a rolling three-hour average, based on the manufacturer's specifications. These specifications must be documented in the test plan developed in accordance with § 63.7(c), or

(ii) Maintain the minimum activated carbon injection carrier gas pressure drop, as a rolling three-hour average, based on the manufacturer's specifications. These specifications must be documented in the test plan developed in accordance with § 63.7(c).

(d) Except as provided in paragraph (e) of this section, for an affected source subject to a D/F emissions limitation under § 63.1343 that employs carbon injection as an emission control technique you must specify and use the brand and type of sorbent used during the performance test until a subsequent performance test is conducted, unless the site-specific performance test plan contains documentation of key parameters that affect adsorption and the owner or operator establishes limits based on those parameters, and the limits on these parameters are maintained.

(e) For an affected source subject to a D/F emissions limitation under § 63.1343 that employs carbon injection as an emission control technique you may substitute, at any time, a different brand or type of sorbent provided that the replacement has equivalent or improved properties compared to the sorbent specified in the site-specific performance test plan and used in the performance test. The owner or operator must maintain documentation that the substitute sorbent will provide the same or better level of control as the original sorbent.

(f) No kiln may use as a raw material or fuel any fly ash where the mercury content of the fly ash has been increased through the use of activated carbon, or any other sorbent, unless the facility can demonstrate that the use of that fly ash will not result in an increase in mercury emissions over baseline emissions (i.e., emissions not using the fly ash). The facility has the burden of proving there has been no emissions increase over baseline. Once the kiln is in compliance with a mercury emissions limit specified in § 63.1343, this paragraph no longer applies.

(g) During periods of startup and shutdown you must meet the requirements listed in (g)(1) through (4) of this section.

(1) During startup you must use any one or combination of the following clean fuels: natural gas, synthetic natural gas, propane, distillate oil, synthesis gas (syngas), and ultra-low sulfur diesel (ULSD) until the kiln reaches a temperature of 1200 degrees Fahrenheit.

(2) Combustion of the primary kiln fuel may commence once the kiln temperature reaches 1200 degrees Fahrenheit.

(3) All air pollution control devices must be turned on and operating prior to combusting any fuel.

(4) You must keep records as specified in § 63.1355 during periods of startup and shutdown.

■ 15. Section 63.1347 is amended by revising paragraph (a)(1) to read as follows:

§ 63.1347 Operation and maintenance plan requirements.

(a) * * *

(1) Procedures for proper operation and maintenance of the affected source and air pollution control devices in order to meet the emissions limits and operating limits, including fugitive dust control measures for open clinker piles, of §§ 63.1343 through 63.1348. Your operations and maintenance plan must address periods of startup and shutdown;

* * * * *

■ 16. Section 63.1348 is amended by:
■ a. Revising paragraphs (a) introductory text and (a)(1) and (2);
■ b. Adding two sentences to paragraph (a)(3)(i);
■ c. Revising paragraph (a)(3)(ii);
■ d. Revising paragraphs (a)(3)(iii) and (iv);
■ e. Revising paragraphs (a)(4) through (8);
■ f. Revising paragraph (b); and
■ g. Revising paragraph (c)(2)(iv).

The revisions and additions read as follows:

§ 63.1348 Compliance requirements.

(a) *Initial Performance Test Requirements.* For an affected source subject to this subpart, you must demonstrate compliance with the emissions standards and operating limits by using the test methods and procedures in §§ 63.1349 and 63.7. Any cement kiln that has been subject to the requirements of subpart CCCC or subpart DDDD of 40 CFR Part 60, and is now electing to cease burning nonhazardous solid waste and become subject to this subpart, must meet all the initial compliance testing requirements each time it becomes subject to this subpart, even if it was previously subject to this subpart.

NOTE to paragraph (a): The first day of the 30 operating day performance test is the first day after the compliance date following completion of the field testing and data collection that demonstrates that the CPMS or CEMS has satisfied the relevant CPMS performance evaluation or CEMS performance specification (e.g., PS 2, 12A, or 12B) acceptance criteria. The performance test period is complete at the end of the 30th consecutive operating day. See § 63.1341 for definition of operating day and § 63.1348(b)(1) for the CEMS operating requirements. The source has the option of performing the compliance test earlier then the compliance date if desired.

(1) *PM Compliance.* If you are subject to limitations on PM emissions under § 63.1343(b), you must demonstrate compliance with the PM emissions standards by using the test methods and procedures in § 63.1349(b)(1).

(2) *Opacity Compliance.* If you are subject to the limitations on opacity under § 63.1345, you must demonstrate compliance with the opacity emissions standards by using the performance test methods and procedures in § 63.1349(b)(2). Use the maximum 6-minute average opacity exhibited during the performance test period to determine whether the affected source is in compliance with the standard.

(3) * * *

(i) * * * The owner or operator of a kiln with an in-line raw mill must demonstrate compliance by conducting separate performance tests while the raw mill is operating and while the raw mill is not operating. Determine the D/F TEQ concentration for each run and calculate the arithmetic average of the TEQ concentrations measured for the three runs to determine continuous compliance.

(ii) If you are subject to a D/F emissions limitation under § 63.1343(b), you must demonstrate compliance with the temperature operating limits specified in § 63.1346 by using the performance test methods and procedures in § 63.1349(b)(3)(ii) through (b)(3)(iv). Use the arithmetic average of the temperatures measured during the three runs to determine the applicable temperature limit.

(iii) If activated carbon injection is used and you are subject to a D/F emissions limitation under § 63.1343(b), you must demonstrate compliance with the activated carbon injection rate operating limits specified in § 63.1346 by using the performance test methods and procedures in § 63.1349(b)(3)(v).

(iv) If activated carbon injection is used, you must also develop a carrier gas parameter (either the carrier gas flow rate or the carrier gas pressure drop) during the initial performance test and updated during any subsequent performance test conducted under § 63.1349(b)(3) that meets the requirements of § 63.1349(b)(3)(vi). Compliance is demonstrated if the system is maintained within +/- 5 percent accuracy during the performance test determined in accordance with the procedures and criteria submitted for review in your monitoring plan required in section 63.1350(p).

(4)(i) *THC Compliance.* If you are subject to limitations on THC emissions under § 63.1343(b), you must demonstrate compliance with the THC emissions standards by using the performance test methods and procedures in § 63.1349(b)(4)(i). You must use the average THC concentration obtained during the first 30 kiln operating days after the compliance date of this rule to determine initial compliance.

(ii) *Total Organic HAP Emissions Tests.* If you elect to demonstrate compliance with the total organic HAP emissions limit under § 63.1343(b) in lieu of the THC emissions limit, you must demonstrate compliance with the total organic HAP emissions standards by using the performance test methods and procedures in § 63.1349(b)(7.

(iii) If you are demonstrating initial compliance, you must conduct the separate performance tests as specified in § 63.1349(b)(7) while the raw mill of the inline kiln/raw mill is operating and while the raw mill of the inline kiln/raw mill is not operating.

(iv) The average total organic HAP concentration measured during the separate initial performance test specified by § 63.1349(b)(7) must be used to determine initial compliance.

(v) The average THC concentration measured during the initial performance test specified by § 63.1349(b)(4) must be used to determine the site-specific THC limit. Using the fraction of time the inline kiln/raw mill is on and the fraction of time that the inline kiln/raw mill is off, calculate this limit as a weighted average of the THC levels measured during raw mill on and raw mill off testing using one of the two approaches in § 63.1349(b)(7)(vii) or (viii) depending on the level of organic HAP measured during the compliance test.

(5) *Mercury Compliance.* If you are subject to limitations on mercury emissions in § 63.1343(b), you must demonstrate compliance with the mercury standards by using the performance test methods and procedures in § 63.1349(b)(5). You must demonstrate compliance by operating a mercury CEMS or a sorbent trap based CEMS. Compliance with the mercury emissions standard must be determined based on the first 30 operating days you operate a mercury CEMS or sorbent trap monitoring system after the compliance date of this rule.

(i) In calculating a 30 operating day emissions value using an integrating sorbent trap CEMS, assign the average Hg emissions concentration determined for an integrating period (e.g., 7 day sorbent trap monitoring system sample) to each relevant hour of the kiln operating days spanned by each integrated sample. Calculate the 30 kiln operating day emissions rate value using the assigned hourly Hg emissions concentrations and the respective flow and production rate values collected during the 30 kiln operating day performance test period. Depending on the duration of each integrated sampling period, you may not be able to calculate the 30 kiln operating day emissions value until several days after the end of the 30 kiln operating day performance test period.

(ii) For example, a sorbent trap monitoring system producing an integrated 7-day sample will provide Hg concentration data for each hour of the first 28 kiln operating days (i.e., four values spanning 7 days each) of a 30 operating day period. The Hg concentration values for the hours of the last 2 days of the 30 operating day period will not be available for calculating the emissions for the performance test period until at least five days after the end of the subject period.

(6) *HCl Compliance.* If you are subject to limitations on HCl emissions under § 63.1343(b), you must demonstrate initial compliance with the HCl standards by using the performance test methods and procedures in § 63.1349(b)(6).

(i) For an affected source that is equipped with a wet scrubber, tray tower or dry scrubber, you may demonstrate initial compliance by conducting a performance test as specified in § 63.1349(b)(6)(i). You must determine the HCl concentration for each run and calculate the arithmetic average of the concentrations measured for the three runs to determine compliance. You must also establish appropriate site-specific operational parameter limits.

(ii) For an affected source that is not equipped with a wet scrubber, tray tower or dry scrubber, you must demonstrate initial compliance by operating a CEMS as specified in § 63.1349(b)(6)(ii). You must use the average of the hourly HCl values obtained during the first 30 kiln operating days that occur after the compliance date of this rule to determine initial compliance.

(7) *Commingled Exhaust Requirements.* If the coal mill exhaust is commingled with kiln exhaust in a single stack, you may demonstrate compliance with the kiln emission limits by either:

(i) Performing required emissions monitoring and testing on the commingled coal mill and kiln exhaust, or

(ii) Perform required emission monitoring and testing of the kiln exhaust prior to the reintroduction of the coal mill exhaust, and also testing the kiln exhaust diverted to the coal mill. All emissions must be added together for all emission points, and must not exceed the limit per each pollutant as listed in S63.1343(b).

(b) *Continuous Monitoring Requirements.* You must demonstrate compliance with the emissions standards and operating limits by using the performance test methods and procedures in §§ 63.1350 and 63.8 for each affected source.

(1) *General Requirements.* (i) You must monitor and collect data according to § 63.1350 and the site-specific monitoring plan required by § 63.1350(p).

(ii) Except for periods of startup and shutdown, monitoring system malfunctions, repairs associated with monitoring system malfunctions, and required monitoring system quality assurance or quality control activities (including, as applicable, calibration checks and required zero and span adjustments), you must operate the monitoring system and collect data at all required intervals at all times the affected source is operating.

(iii) You may not use data recorded during monitoring system malfunctions, repairs associated with monitoring system malfunctions, or required monitoring system quality assurance or control activities in calculations used to report emissions or operating levels. A monitoring system malfunction is any sudden, infrequent, not reasonably preventable failure of the monitoring system to provide valid data. Monitoring system failures that are caused in part by poor maintenance or careless operation are not malfunctions. You must use all the data collected during all other periods in assessing the operation of the control device and associated control system.

(iv) *Clinker Production.* If you are subject to limitations on mercury emissions (lb/MM tons of clinker) under § 63.1343(b), you must determine the hourly production rate of clinker according to the requirements of § 63.1350(d).

(2) *PM Compliance.* If you are subject to limitations on PM emissions under § 63.1343(b), you must use the monitoring methods and procedures in § 63.1350(b) and (d).

(3) *Opacity Compliance.* If you are subject to the limitations on opacity under § 63.1345, you must demonstrate compliance using the monitoring methods and procedures in § 63.1350(f) based on the maximum 6-minute average opacity exhibited during the performance test period. You must initiate corrective actions within one hour of detecting visible emissions above the applicable limit.

(i) *COMS.* If you install a COMS in lieu of conducting the daily visible emissions testing, you must demonstrate compliance using a COMS such that it is installed, operated, and maintained in accordance with the requirements of § 63.1350(f)(4)(i).

(ii) Bag leak determination system (*BLDS).* If you install a BLDS on a raw mill or finish mill in lieu of conducting the daily visible emissions testing, you must demonstrate compliance using a BLDS that is installed, operated, and maintained in accordance with the requirements of § 63.1350(f)(4)(ii).

(4) *D/F Compliance.* If you are subject to a D/F emissions limitation under § 63.1343(b), you must demonstrate compliance using a CMS that is installed, operated and maintained to record the temperature of specified gas streams in accordance with the requirements of § 63.1350(g).

(5)(i) *Activated Carbon Injection Compliance.* If you use activated carbon injection to comply with the D/F emissions limitation under § 63.1343(b), you must demonstrate compliance using a CMS that is installed, operated, and maintained to record the rate of activated carbon injection in accordance with the requirements § 63.1350(h)(1).

(ii) If you use activated carbon injection to comply with the D/F emissions limitation under § 63.1343(b), you must demonstrate compliance using a CMS that is installed, operated and maintained to record the activated carbon injection system gas parameter in accordance with the requirements of § 63.1350(h)(2).

(6) THC Compliance. (i) If you are subject to limitations on THC emissions under § 63.1343(b), you must demonstrate compliance using the monitoring methods and procedures in § 63.1350(i) and (j).

(ii) THC must be measured either upstream of the coal mill or in the coal mill stack.

(7) Mercury Compliance. (i) If you are subject to limitations on mercury emissions in § 63.1343(b), you must demonstrate compliance using the monitoring methods and procedures in § 63.1350(k). If you use an integrated sorbent trap monitoring system to determine ongoing compliance, use the procedures described in § 63.1348(a)(5) to assign hourly mercury concentration values and to calculate rolling 30 operating day emissions rates. Since you assign the mercury concentration measured with the sorbent trap to each relevant hour respectively for each operating day of the integrated period, you may schedule the sorbent trap change periods to any time of the day (i.e., the sorbent trap replacement need not be scheduled at 12:00 midnight nor must the sorbent trap replacements occur only at integral 24-hour intervals).

(ii) Mercury must be measured either upstream of the coal mill or in the coal mill stack.

(8) *HCl Compliance.* If you are subject to limitations on HCl emissions under § 63.1343(b), you must demonstrate compliance using the performance test methods and procedures in § 63.1349(b)(6).

(i) For an affected source that is not equipped with a wet scrubber, tray tower or a dry sorbent injection system, you must demonstrate compliance using the monitoring methods and procedures in § 63.1350(l)(1).

(ii) For an affected source that is equipped with a wet scrubber, tray tower or a dry sorbent injection system, you may demonstrate compliance using the monitoring methods and procedures in § 63.1350(l)(2).

(iii) HCl may be measured either upstream of the coal mill or in the coal mill stack.

(iv) As an alternative to paragraph (b)(8)(ii) of this section, you may use an SO_2 CEMS to establish an SO_2 operating level during your initial and repeat HCl performance tests and monitor the SO_2 level using the procedures in § 63.1350(l)(3).

(9) Startup and Shutdown Compliance. In order to demonstrate continuous compliance during startup and shutdown, all air pollution control devices must be operating.

(c) * * *

(2) * * *

(iv) The performance test must be completed within 360 hours after the planned operational change period begins.

* * * * *

■ 17. Section 63.1349 is amended by:

■ a. Revising paragraph (a) introductory text;

■ b. Revising paragraph (b)(1);

■ c. Revising paragraph (b)(3) introductory text;

■ d. Revising paragraphs (b)(3)(v) and (vi);

■ e. Revising paragraphs (b)(4), (5), and (6);

■ f. Adding paragraph (b)(7) and (8); and

■ g. Revising paragraphs (c), (d)(1) introductory text, (d)(1)(ii), (d)(2), and (e).

The revisions and additions read as follows:

§ 63.1349 Performance testing requirements.

(a) You must document performance test results in complete test reports that contain the information required by paragraphs (a)(1) through (10) of this section, as well as all other relevant information. As described in § 63.7(c)(2)(i), you must make available to the Administrator prior to testing, if requested, the site-specific test plan to be followed during performance testing. For purposes of determining exhaust gas flow rate to the atmosphere from an alkali bypass stack or a coal mill stack, you must either install, operate, calibrate and maintain an instrument for continuously measuring and recording the exhaust gas flow rate according to the requirements in paragraphs § 63.1350(n)(1) through (10) of this subpart or use the maximum design exhaust gas flow rate. For purposes of determining the combined emissions from kilns equipped with an alkali bypass or that exhaust kiln gases to a coal mill that exhausts through a separate stack, instead of installing a CEMS on the alkali bypass stack or coal mill stack, you may use the results of the initial and subsequent performance test to demonstrate compliance with the relevant emissions limit.

* * * * *

(b)(1) *PM emissions tests.* The owner or operator of a kiln subject to limitations on PM emissions shall demonstrate initial compliance by conducting a performance test using Method 5 or Method 5I at appendix A–3 to part 60 of this chapter. You must also monitor continuous performance through use of a PM continuous parametric monitoring system (PM CPMS).

(i) For your PM CPMS, you will establish a site-specific operating limit. If your PM performance test demonstrates your PM emission levels to be below 75 percent of your emission limit you will use the average PM CPMS value recorded during the PM compliance test, the milliamp equivalent of zero output from your PM CPMS, and the average PM result of your compliance test to establish your operating limit. If your PM compliance test demonstrates your PM emission levels to be at or above 75 percent of your emission limit you will use the average PM CPMS value recorded during the PM compliance test to establish your operating limit. You will use the PM CPMS to demonstrate continuous compliance with your operating limit. You must repeat the performance test annually and reassess and adjust the site-specific operating limit in accordance with the results of the performance test.

(A) Your PM CPMS must provide a 4–20 milliamp output and the establishment of its relationship to manual reference method measurements must be determined in units of milliamps.

(B) Your PM CPMS operating range must be capable of reading PM concentrations from zero to a level equivalent to three times your allowable emission limit. If your PM CPMS is an auto-ranging instrument capable of multiple scales, the primary range of the instrument must be capable of reading PM concentration from zero to a level equivalent to three times your allowable emission limit.

(C) During the initial performance test or any such subsequent performance test that demonstrates compliance with the PM limit, record and average all milliamp output values from the PM CPMS for the periods corresponding to the compliance test runs (e.g., average all your PM CPMS output values for three corresponding 2-hour Method 5I test runs).

(ii) Determine your operating limit as specified in paragraphs (b)(1)(iii) through (iv) of this section. If your PM performance test demonstrates your PM emission levels to be below 75 percent of your emission limit you will use the average PM CPMS value recorded during the PM compliance test, the milliamp equivalent of zero output from your PM CPMS, and the average PM result of your compliance test to establish your operating limit. If your PM compliance test demonstrates your PM emission levels to be at or above 75 percent of your emission limit you will use the average PM CPMS value recorded during the PM compliance test to establish your operating limit. You must verify an existing or establish a new operating limit after each repeated performance test. You must repeat the performance test at least annually and reassess and adjust the site-specific operating limit in accordance with the results of the performance test.

(iii) If the average of your three Method 5 or 5I compliance test runs is below 75 percent of your PM emission limit, you must calculate an operating limit by establishing a relationship of PM CPMS signal to PM concentration using the PM CPMS instrument zero, the average PM CPMS values corresponding to the three compliance test runs, and the average PM concentration from the Method 5 or 5I compliance test with the procedures in (a)(1)(iii)(A) through (D) of this section.

(A) Determine your PM CPMS instrument zero output with one of the following procedures.

(*1*) Zero point data for in-situ instruments should be obtained by removing the instrument from the stack and monitoring ambient air on a test bench.

(*2*) Zero point data for extractive instruments should be obtained by removing the extractive probe from the stack and drawing in clean ambient air.

(*3*) The zero point may also be established by performing manual reference method measurements when the flue gas is free of PM emissions or contains very low PM concentrations (e.g., when your process is not operating, but the fans are operating or your source is combusting only natural gas) and plotting these with the compliance data to find the zero intercept.

(*4*) If none of the steps in paragraphs (a)(1)(iii)(A)(*1*) through (*3*) of this section are possible, you must use a zero output value provided by the manufacturer.

(B) Determine your PM CPMS instrument average in milliamps, and the average of your corresponding three PM compliance test runs, using equation 3.

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} X_1 , \bar{y} = \frac{1}{n}\sum_{i=1}^{n} Y_1 \qquad \text{(Eq. 3)}$$

Where:

X_1 = The PM CPMS data points for the three runs constituting the performance test.

Y_1 = The PM concentration value for the three runs constituting the performance test.

n = The number of data points.

(C) With your instrument zero expressed in milliamps, your three run average PM CPMS milliamp value, and your three run PM compliance test average, determine a relationship of lb/ton-clinker per milliamp with Equation 4.

$$R = \frac{Y_1}{(X_1 - z)} \qquad \text{(Eq. 4)}$$

Where:

R = The relative lb/ton-clinker per milliamp for your PM CPMS.

Y_1 = The three run average lb/ton-clinker PM concentration.

X_1 = The three run average milliamp output from you PM CPMS.

z = The milliamp equivalent of your instrument zero determined from (b)(1)(iii)(A).

(D) Determine your source specific 30-day rolling average operating limit using the lb/ton-clinker per milliamp value from Equation 4 in Equation 5, below. This sets your operating limit at the PM CPMS output value corresponding to 75 percent of your emission limit.

$$O_l = z + \frac{0.75(L)}{R} \qquad \text{(Eq. 5)}$$

Where:

O_l = The operating limit for your PM CPMS on a 30-day rolling average, in milliamps.

L = Your source emission limit expressed in lb/ton clinker.

z = Your instrument zero in milliamps, determined from (1)(i).

R = The relative lb/ton-clinker per milliamp for your PM CPMS, from Equation 4.

(iv) If the average of your three PM compliance test runs is at or above 75 percent of your PM emission limit you must determine your operating limit by averaging the PM CPMS milliamp output corresponding to your three PM performance test runs that demonstrate compliance with the emission limit using Equation 6.

$$O_h = \frac{1}{n}\sum_{i=1}^{n} X_1 \qquad \text{(Eq. 6)}$$

Where:

X_1 = The PM CPMS data points for all runs i.

n = The number of data points.

O_h = Your site specific operating limit, in milliamps.

(v) To determine continuous operating compliance, you must record the PM CPMS output data for all periods when the process is operating, and use all the PM CPMS data for calculations when the source is not out-of-control. You must demonstrate continuous compliance by using all quality-assured hourly average data collected by the PM CPMS for all operating hours to calculate the arithmetic average operating parameter in units of the operating limit (milliamps) on a 30 operating day rolling average basis, updated at the end of each new kiln operating day. Use Equation 7 to determine the 30 kiln operating day average.

$$30\text{kiln operating day} = \frac{\sum_{i=1}^{n} Hpv_i}{n} \qquad \text{(Eq. 7)}$$

Where:

Hpvi = The hourly parameter value for hour i.

n = The number of valid hourly parameter values collected over 30 kiln operating days.

(vi) For each performance test, conduct at least three separate test runs under the conditions that exist when the affected source is operating at the highest load or capacity level reasonably expected to occur. Conduct each test run to collect a minimum sample volume of 2 dscm for determining compliance with a new source limit and 1 dscm for determining compliance with an existing source limit. Calculate the average of the results from three consecutive runs, including applicable sources as required by (D)(viii), to determine compliance. You need not determine the particulate matter collected in the impingers (''back half'') of the Method 5 or Method 5I particulate sampling train to demonstrate compliance with the PM standards of this subpart. This shall not preclude the permitting authority from requiring a determination of the ''back half'' for other purposes.

(vii) For PM performance test reports used to set a PM CPMS operating limit, the electronic submission of the test report must also include the make and model of the PM CPMS instrument, serial number of the instrument, analytical principle of the instrument (e.g. beta attenuation), span of the instruments primary analytical range, milliamp value equivalent to the instrument zero output, technique by which this zero value was determined, and the average milliamp signals corresponding to each PM compliance test run.

(viii) When there is an alkali bypass and/or an inline coal mill with a separate stack associated with a kiln, the main exhaust and alkali bypass and/or inline coal mill must be tested simultaneously and the combined emission rate of PM from the kiln and alkali bypass and/or inline coal mill must be computed for each run using Equation 8 of this section.

$$E_c = \frac{E_K + E_B + E_C}{P} \qquad \text{(Eq. 8)}$$

Where:

E_C = Combined hourly emission rate of PM from the kiln and bypass stack and/or inline coal mill, lb/ton of kiln clinker production.

E_K = Hourly emissions of PM emissions from the kiln, lb.

E_B = Hourly PM emissions from the alkali bypass stack, lb.

E_C = Hourly PM emissions from the inline coal mill stack, lb.

P = Hourly clinker production, tons.

(ix) The owner or operator of a kiln with an in-line raw mill and subject to limitations on PM emissions shall demonstrate initial compliance by conducting separate performance tests while the raw mill is under normal operating conditions and while the raw mill is not operating.

* * * * *

(3) *D/F Emissions Tests.* If you are subject to limitations on D/F emissions under this subpart, you must conduct a performance test using Method 23 of appendix A–7 to part 60 of this chapter. If your kiln or in-line kiln/raw mill is equipped with an alkali bypass, you must conduct simultaneous performance tests of the kiln or in-line kiln/raw mill exhaust and the alkali bypass. You may conduct a performance test of the alkali bypass exhaust when the raw mill of the in-line kiln/raw mill is operating or not operating.

* * * * *

(v)(A) If sorbent injection is used for D/F control, you must record the rate of sorbent injection to the kiln exhaust, and where applicable, the rate of sorbent injection to the alkali bypass exhaust, continuously during the period of the Method 23 test in accordance with the conditions in § 63.1350(m)(9), and include the continuous injection rate record(s) in the performance test report. Determine the sorbent injection rate parameters in accordance with paragraphs (b)(3)(vi) of this section.

(B) Include the brand and type of sorbent used during the performance test in the performance test report.

(C) Maintain a continuous record of either the carrier gas flow rate or the carrier gas pressure drop for the duration of the performance test. If the carrier gas flow rate is used, determine, record, and maintain a record of the accuracy of the carrier gas flow rate monitoring system according to the procedures in appendix A to part 75 of this chapter. If the carrier gas pressure drop is used, determine, record, and maintain a record of the accuracy of the carrier gas pressure drop monitoring system according to the procedures in § 63.1350(m)(6).

(vi) Calculate the run average sorbent injection rate for each run and determine and include the average of the run average injection rates in the performance test report and determine the applicable injection rate limit in accordance with § 63.1346(c)(1).

(4) *THC emissions test.* (i) If you are subject to limitations on THC emissions, you must operate a CEMS in accordance with the requirements in § 63.1350(i). For the purposes of conducting the accuracy and quality assurance evaluations for CEMS, the THC span value (as propane) is 50 ppmvd and the reference method (RM) is Method 25A of appendix A to part 60 of this chapter.

(ii) Use the THC CEMS to conduct the initial compliance test for the first 30 kiln operating days of kiln operation after the compliance date of the rule. See 63.1348(a).

(iii) If kiln gases are diverted through an alkali bypass or to a coal mill and exhausted through a separate stack, you must calculate a kiln-specific THC limit using Equation 9:

$$Cks = \frac{(MACT\ Limit \times (Qab + Qcm + Qks)) - (Qab \times Cab) - (Qcm \times Ccm)}{Qks} \qquad \text{((Eq. 9)}$$

Where:

Cks = Kiln stack concentration (ppmvd).
Qab = Alkali bypass flow rate (volume/hr).
Cab = Alkali bypass concentration (ppmvd).
Qcm = Coal mill flow rate (volume/hr).
Ccm = Coal mill concentration (ppmvd).
Qks = Kiln stack flow rate (volume/hr).

(iv) THC must be measured either upstream of the coal mill or the coal mill stack.

(v) Instead of conducting the performance test specified in paragraph (b)(4)of this section, you may conduct a performance test to determine emissions of total organic HAP by following the procedures in paragraphs (b)(7) of this section.

(5) *Mercury Emissions Tests.* If you are subject to limitations on mercury emissions, you must operate a mercury CEMS or a sorbent trap monitoring system in accordance with the requirements of § 63.1350(k). The initial compliance test must be based on the first 30 kiln operating days in which the affected source operates using a mercury CEMS or a sorbent trap monitoring system after the compliance date of the rule. See § 63.1348(a).

(i) If you are using a mercury CEMS or a sorbent trap monitoring system, you must install, operate, calibrate, and maintain an instrument for continuously measuring and recording the exhaust gas flow rate to the atmosphere according to the requirements in § 63.1350(k)(5).

(ii) Calculate the emission rate using Equation 10 of this section:

$$E_{30D} = k\,\frac{\sum_{i=1}^{n} C_i Q_i}{P} \qquad \text{(Eq. 10)}$$

Where:

E_{30D} = 30-day rolling emission rate of mercury, lb/MM tons clinker.
C_i = Concentration of mercury for operating hour i, µg/scm.
Q_i = Volumetric flow rate of effluent gas for operating hour i, where C_i and Q_i are on the same basis (either wet or dry), scm/hr.
k = Conversion factor, 1 lb/454,000,000 µg.
n = Number of kiln operating hours in a 30 kiln operating day period.
P = 30 days of clinker production during the same time period as the mercury emissions measured, million tons.

(6) *HCl emissions tests.* For a source subject to limitations on HCl emissions you must conduct performance testing by one of the following methods:

(i)(A) If the source is equipped with a wet scrubber, tray tower or dry scrubber, you must conduct performance testing using Method 321 of appendix A to this part unless you have installed a CEMS that meets the requirements § 63.1350(l)(1). For kilns with inline raw mills, testing should be conducted for the raw mill on and raw mill off conditions.

(B) You must establish site specific parameter limits by using the CPMS required in § 63.1350(l)(1). For a wet scrubber or tray tower, measure and record the pressure drop across the scrubber and/or liquid flow rate and pH in intervals of no more than 15 minutes during the HCl test. Compute and record the 24-hour average pressure drop, pH, and average scrubber water flow rate for each sampling run in which the applicable emissions limit is met. For a dry scrubber, measure and record the sorbent injection rate in intervals of no more than 15 minutes during the HCl test. Compute and record the 24-hour average sorbent injection rate and average sorbent injection rate for each sampling run in which the applicable emissions limit is met.

(ii)(A) If the source is not controlled by a wet scrubber, tray tower or dry sorbent injection system, you must operate a CEMS in accordance with the requirements of § 63.1350(l)(1). See § 63.1348(a).

(B) The initial compliance test must be based on the 30 kiln operating days that occur after the compliance date of this rule in which the affected source operates using a HCl CEMS. Hourly HCl concentration data must be obtained according to § 63.1350(l).

(iii) As an alternative to paragraph (b)(6)(i)(B) of this section, you may choose to monitor SO_2 emissions using a CEMS in accordance with the requirements of § 63.1350(l)(3). You must establish an SO_2 operating limit equal to the highest 1 hour average recorded during the HCl stack test. This operating limit will apply only for demonstrating HCl compliance.

(iv) If kiln gases are diverted through an alkali bypass or to a coal mill and exhausted through a separate stack, you must calculate a kiln-specific HCl limit using Equation 11:

$$Cks = \frac{(MACT\ Limit \times (Qab + Qcm + Qks)) - (Qab \times Cab) - (Qcm \times Ccm)}{Qks} \qquad \text{(Eq. 11)}$$

Where:

Cks = Kiln stack concentration (ppmvd).
Qab = Alkali bypass flow rate (volume/hr).
Cab = Alkali bypass concentration (ppmvd).
Qcm = Coal mill flow rate (volume/hr).
Ccm = Coal mill concentration (ppmvd).
Qks = Kiln stack flow rate (volume/hr).

(7) *Total Organic HAP Emissions Tests.* Instead of conducting the performance test specified in paragraph (a)(4) of this section, you may conduct a performance test to determine emissions of total organic HAP by following the procedures in paragraphs (a)(7)(i) through (v) of this section.

(i) Use Method 320 of appendix A to this part, Method 18 of Appendix A of part 60, ASTM D6348–03 or a combination to determine emissions of total organic HAP. Each performance test must consist of three separate runs under the conditions that exist when the affected source is operating at the representative performance conditions in accordance with § 63.7(e). Each run must be conducted for at least 1 hour.

(ii) At the same time that you are conducting the performance test for total organic HAP, you must also determine a site-specific THC emissions limit by operating a THC CEMS in accordance with the requirements of § 63.1350(j). The duration of the performance test must be at least 3 hours and the average THC concentration (as calculated from the 1-minute averages) during the 3-hour test must be calculated. You must establish your THC operating limit and determine compliance with it according to paragraphs (a)(7)(vii)through (viii)of this section. It is permissible to extend the testing time of the organic HAP performance test if you believe extended testing is required to adequately capture THC variability over time.

(iii) If your source has an in-line kiln/raw mill you must use the fraction of time the raw mill is on and the fraction of time that the raw mill is off and calculate this limit as a weighted average of the THC levels measured during raw mill on and raw mill off testing.

(iv) If your organic HAP emissions are below 75 percent of the organic HAP standard and you determine your operating limit with paragraph (b)(7)(vii) of this section your THC CEMS must be calibrated and operated on a measurement scale no greater than 180 ppmvw, as carbon, or 60 ppmvw as propane.

(v) Your THC CEMS measurement scale must be capable of reading THC concentrations from zero to a level equivalent to two times your highest THC emissions average determined during your performance test, including mill on or mill off operation. **Note:** This may require the use of a dual range instrument to meet this requirement and paragraph (b)(7)(iv) of this section.

(vi) Determine your operating limit as specified in paragraphs (a)(7)(vii) and (viii) of this section. If your organic HAP performance test demonstrates your average organic HAP emission levels are below 75 percent of your emission limit (9 ppmv) you will use the average THC value recorded during the organic HAP performance test, and the average total organic HAP result of your performance test to establish your operating limit. If your organic HAP compliance test results demonstrate your average organic HAP emission levels are at or above 75 percent of your emission limit, your operating limit is established as the average THC value recorded during the organic HAP performance test. You must establish a new operating limit after each performance test. You must repeat the performance test no later than 30 months following your last performance test and reassess and adjust the site-specific operating limit in accordance with the results of the performance test.

(vii) If the average organic HAP results for your three Method 18 and/or Method 320 performance test runs are below 75 percent of your organic HAP emission limit, you must calculate an operating limit by establishing a relationship of THC CEMS signal to the organic HAP concentration using the average THC CEMS value corresponding to the three organic HAP compliance test runs and the average organic HAP total concentration from the Method 18 and/or Method 320 performance test runs with the procedures in (a)(7)(vii)(A) and (B) of this section.

(A) Determine the THC CEMS average values in ppmvw, and the average of your corresponding three total organic HAP compliance test runs, using Equation 12.

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} X_i \,, \bar{y} = \frac{1}{n}\sum_{i=1}^{n} Y_i \qquad \text{(Eq. 12)}$$

Where:

x̄ = The THC CEMS average values in ppmvw.
Xi= The THC CEMS data points for all three runs i.
Yi= The sum of organic HAP concentrations for test runs i. and
n = The number of data points.

(B) You must use your three run average THC CEMS value, and your three run average organic HAP concentration from your three Method 18 and/or Method 320 compliance tests to determine the operating limit. Use equation 13 to determine your operating limit in units of ppmvw THC, as propane.

$$T_l = \left(\frac{9}{Y_1}\right) * X_1 \qquad \text{(Eq. 13)}$$

Where:

T_l = The 30-day operating limit for your THC CEMS, ppmvw.

Y_1 = The average organic HAP concentration from Eq. 12, ppmv.

X_1 = The average THC CEMS concentration from Eq. 12, ppmvw.

(viii) If the average of your three organic HAP performance test runs is at or above 75 percent of your organic HAP emission limit, you must determine your operating limit using Equation 14 by averaging the THC CEMS output values corresponding to your three organic HAP performance test runs that demonstrate compliance with the emission limit. If your new THC CEMS value is below your current operating limit, you may opt to retain your current operating limit, but you must still submit all performance test and THC CEMS data according to the reporting requirements in paragraph (d)(1) of this section.

$$T_h = \frac{1}{n}\sum_{i=1}^{n} X_1 \,. \qquad \text{(Eq. 14)}$$

Where:

X1 = The THC CEMS data points for all runs i.

Y1 = The organic HAP total value for runs i.

n = The number of data points.

T_h = Your site specific operating limit, in ppmvw THC.

(ix) If your kiln has an inline kiln/raw mill, you must conduct separate performance tests while the raw mill is operating (''mill on'') and while the raw mill is not operating (''mill off''). Using the fraction of time the raw mill is on and the fraction of time that the raw mill is off, calculate this limit as a weighted average of the THC levels measured during raw mill on and raw mill off compliance testing with Equation 15.

$$R=(y*t)+(x*(1-t)) \qquad \text{(Eq.15)}$$

Where:

R = Operating limit as THC, ppmvw.

y = Average THC CEMS value during mill on operations, ppmvw.

t = Percentage of operating time with mill on.

x = Average THC CEMS value during mill off operations, ppmvw.

(1-t) = Percentage of operating time with mill off.

(x) To determine continuous compliance with the THC operating limit, you must record the THC CEMS output data for all periods when the process is operating and the THC CEMS is not out-of-control. You must demonstrate continuous compliance by using all quality-assured hourly average data collected by the THC CEMS for all operating hours to calculate the arithmetic average operating parameter in units of the operating limit (ppmvw) on a 30 operating day rolling average basis, updated at the end of each new kiln operating day. Use Equation 16 to determine the 30 kiln operating day average.

$$30\text{kiln operating day} = \frac{\sum\limits_{i=1}^{n} Hpv_i}{n} \qquad \text{(Eq. 16)}$$

Where:

Hpvi = The hourly parameter value for hour i, ppmvw.

n = The number of valid hourly parameter values collected over 30 kiln operating days.

(xi) Use EPA Method 18 or Method 320 of appendix A to part 60 of this chapter to determine organic HAP emissions. For each performance test, conduct at least three separate runs under the conditions that exist when the affected source is operating at the highest load or capacity level reasonably expected to occur. If your source has an in-line kiln/raw mill you must conduct three separate test runs with the raw mill on, and three separate runs under the conditions that exist when the affected source is operating at the highest load or capacity level reasonably expected to occur with the mill off. Conduct each Method 18 test run to collect a minimum target sample equivalent to three times the method detection limit. Calculate the average of the results from three runs to determine compliance.

(xii) If the THC level exceeds by 10 percent or more your site-specific THC emissions limit, you must

(A) As soon as possible but no later than 30 days after the exceedance, conduct an inspection and take corrective action to return the THC CEMS measurements to within the established value; and

(B) Within 90 days of the exceedance or at the time of the annual compliance test, whichever comes first, conduct another performance test to determine compliance with the organic HAP limit and to verify or re-establish your site-specific THC emissions limit.

(8) HCl Emissions Tests with SO_2 Monitoring. If you choose to monitor SO_2 emissions using a CEMS to demonstrate HCl compliance, follow the procedures in (b)(8)(i) through (ix) of this section and in accordance with the requirements of § 63.1350(l)(3). You must establish an SO_2 operating limit equal to the average of the SO_2 emissions recorded during the HCl stack test. This operating limit will apply only for demonstrating HCl compliance.

(i) Use Method 321 of appendix A to this part to determine emissions of HCl. Each performance test must consist of three separate runs under the conditions that exist when the affected source is operating at the representative performance conditions in accordance with § 63.7(e). Each run must be conducted for at least one hour.

(ii) At the same time that you are conducting the performance test for HCl, you must also determine a site-specific SO_2 emissions limit by operating an SO_2 CEMS in accordance with the requirements of § 63.1350(l). The duration of the performance test must be three hours and the average SO_2 concentration (as calculated from the 1-minute averages) during the 3-hour test must be calculated. You must establish your SO_2 operating limit and determine compliance with it according to paragraphs (b)(8)(vii) and (viii)of this section.

(iii) If your source has an in-line kiln/raw mill you must use the fraction of time the raw mill is on and the fraction of time that the raw mill is off and calculate this limit as a weighted average of the SO_2 levels measured during raw mill on and raw mill off testing.

(iv) Your SO_2 CEMS must be calibrated and operated according to the requirements of § 60.63(f).

(v) Your SO_2 CEMS measurement scale must be capable of reading SO_2 concentrations consistent with the requirements of § 60.63(f), including mill on or mill off operation.

(vi) If your kiln has an inline kiln/raw mill, you must conduct separate performance tests while the raw mill is operating (''mill on'') and while the raw mill is not operating (''mill off''). Using the fraction of time the raw mill is on and the fraction of time that the raw mill is off, calculate this limit as a weighted average of the THC levels measured during raw mill on and raw mill off compliance testing with Equation 17.

$$R=(y*t)+x*(t-1) \qquad \text{(Eq. 17)}$$

Where:

R = Operating limit as SO_2, ppmvw.
y = Average SO_2 CEMS value during mill on operations, ppmvw.
t = Percentage of operating time with mill on, expressed as a decimal.
x = Average SO_2 CEMS value during mill off operations, ppmvw.
$t - 1$ = Percentage of operating time with mill off, expressed as a decimal.

(vii) To determine continuous compliance with the SO_2 operating limit, you must record the SO_2 CEMS output data for all periods when the process is operating and the SO_2 CEMS is not out-of-control. You must demonstrate continuous compliance by using all quality-assured hourly average data collected by the SO_2 CEMS for all operating hours to calculate the arithmetic average operating parameter in units of the operating limit (ppmvw) on a 30 operating day rolling average basis, updated at the end of each new kiln operating day. Use Equation 18 to determine the 30 kiln operating day average.

$$\text{30kiln operating day} = \frac{\sum_{i=1}^{n} Hpv_i}{n} \qquad \text{(Eq. 18)}$$

Where:

Hpvi = The hourly parameter value for hour i, ppmvw.
n = The number of valid hourly parameter values collected over 30 kiln operating days.

(viii) Use EPA Method 321 of appendix A to part 60 of this chapter to determine HCl emissions. For each performance test, conduct at least three separate runs under the conditions that exist when the affected source is operating at the highest load or capacity level reasonably expected to occur. If your source has an in-line kiln/raw mill you must conduct three separate test runs with the raw mill on, and three separate runs under the conditions that exist when the affected source is operating at the highest load or capacity level reasonably expected to occur with the mill off.

(ix) If the SO_2 level exceeds by 10 percent or more your site-specific SO_2 emissions limit, you must

(A) As soon as possible but no later than 30 days after the exceedance, conduct an inspection and take corrective action to return the SO_2 CEMS measurements to within the established value. and

(B) Within 90 days of the exceedance or at the time of the annual compliance test, whichever comes first, conduct another performance test to determine compliance with the HCl limit and to verify or re-establish your site-specific SO_2 emissions limit.

(c) *Performance Test Frequency.* Except as provided in § 63.1348(b), performance tests are required at regular intervals for affected sources that are subject to a dioxin, organic HAP or HCl emissions limit and must be repeated every 30 months except for pollutants where that specific pollutant is monitored using CEMS. Tests for PM are repeated every 12 months.

(d) *Performance Test Reporting Requirements.* (1) You must submit the information specified in paragraphs (d)(1) and (2) of this section no later than 60 days following the initial performance test. All reports must be signed by a responsible official.

* * * * *

(ii) The values for the site-specific operating limits or parameters established pursuant to paragraphs (b)(1), (3), (6), and (7) of this section, as applicable, and a description, including sample calculations, of how the operating parameters were established during the initial performance test.

(2) As of December 31, 2011 and within 60 days after the date of completing each performance evaluation or test, as defined in § 63.2, conducted to demonstrate compliance with any standard covered by this subpart, you must submit the relative accuracy test audit data and performance test data, except opacity data, to the EPA by successfully submitting the data electronically to the EPA's Central Data Exchange (CDX) by using the Electronic Reporting Tool(ERT) (see *http://www.epa.gov/ttn/chief/ert/ert_tool.html/*).

(e) *Conditions of performance tests.* Conduct performance tests under such conditions as the Administrator specifies to the owner or operator based on representative performance of the affected source for the period being tested. Upon request, you must make available to the Administrator such records as may be necessary to determine the conditions of performance tests.

■ 18. Section 63.1350 is amended by:
■ a. Revising paragraphs (a) through (d);
■ b. Revising paragraph (f) introductory text;

■ c. Revising paragraphs (f)(1)(iv) through (f)(1)(vi);
■ d. Revising paragraphs (f)(2)(i) and (f)(2)(iii);
■ e. Revising paragraphs (f)(3) and (f)(4);
■ f. Revising paragraph (g)(1) introductory text;
■ g. Revising paragraphs (g)(2) and (g)(4);
■ h. Revising paragraph (h)(1)(ii);
■ i. Revising paragraphs (i)(1) and (i)(2);
■ j. Revising paragraph (k);
■ k. Revising paragraph (l);
■ l. Revising paragraph (m) introductory text;
■ m. Revising paragraphs (m)(3) and (m)(7)(i);
■ n. Revising introductory text for paragraphs (m)(9) and (m) (10);
■ o. Revising paragraph (m)(10)(i) through (m)(10)(vii), and paragraph (m)(11)(v);
■ p. Revising introductory text for paragraphs (n), (o), and (p);
■ q. Removing and reserving paragraph (n)(3); and
■ r. Revising introductory text for paragraphs (p)(1), (p)(2), and (p)(5).

The revisions and additions read as follows:

§ 63.1350 Monitoring requirements.

(a)(1) Following the compliance date, the owner or operator must demonstrate compliance with this subpart on a continuous basis by meeting the requirements of this section.

(2) All continuous monitoring data for periods of startup and shutdown must be compiled and averaged separately from data gathered during other operating periods.

(3) For each existing unit that is equipped with a CMS, maintain the average emissions or the operating parameter values within the operating parameter limits established through performance tests.

(4) Any instance where the owner or operator fails to comply with the continuous monitoring requirements of this section is a violation.

(b) *PM monitoring requirements.* (1)(i) *PM CPMS.* You will use a PM CPMS to establish a site-specific operating limit corresponding to the results of the performance test demonstrating compliance with the PM limit. You will conduct your performance test using Method 5 or Method 5I at appendix A–3 to part 60 of this chapter. You will use the PM CPMS to demonstrate continuous compliance with this operating limit. You must repeat the performance test annually and reassess and adjust the site-specific operating limit in accordance with the results of the performance test using the procedures in § 63.1349(b)(1) (i) through (vi) of this subpart. You must also repeat the test if you change the analytical range of the instrument, or if you replace the instrument itself or any principle analytical component of the instrument that would alter the relationship of output signal to in-stack PM concentration.

(ii) To determine continuous compliance, you must use the PM CPMS output data for all periods when the process is operating and the PM CPMS is not out-of-control. You must demonstrate continuous compliance by using all quality-assured hourly average data collected by the PM CPMS for all operating hours to calculate the arithmetic average operating parameter in units of the operating limit (milliamps) on a 30 operating day rolling average basis, updated at the end of each new kiln operating day.

(iii) For any exceedance of the 30 process operating day PM CPMS average value from the established operating parameter limit, you must:

(A) Within 48 hours of the exceedance, visually inspect the APCD;

(B) If inspection of the APCD identifies the cause of the exceedance, take corrective action as soon as possible and return the PM CPMS measurement to within the established value; and

(C) Within 30 days of the exceedance or at the time of the annual compliance test, whichever comes first, conduct a PM emissions compliance test to determine compliance with the PM emissions limit and to verify or re-establish the PM CPMS operating limit within 45 days. You are not required to conduct additional testing for any exceedances that occur between the time of the original exceedance and the PM emissions compliance test required under this paragraph.

(iv) PM CPMS exceedances leading to more than four required performance tests in a 12-month process operating period (rolling monthly) constitute a presumptive violation of this subpart.

(2) [Reserved]

(c) [Reserved]

(d) *Clinker production monitoring requirements.* In order to determine clinker production, you must:

(1) Determine hourly clinker production by one of two methods:

(i) Install, calibrate, maintain, and operate a permanent weigh scale system to measure and record weight rates in tons-mass per hour of the amount of clinker produced. The system of measuring hourly clinker production must be maintained within ±5 percent accuracy, or

(ii) Install, calibrate, maintain, and operate a permanent weigh scale system to measure and record weight rates in tons-mass per hour of the amount of feed to the kiln. The system of measuring feed must be maintained within ±5 percent accuracy. Calculate your hourly clinker production rate using a kiln-specific feed to clinker ratio based on reconciled clinker production determined for accounting purposes and recorded feed rates. Update this ratio monthly. Note that if this ratio changes at clinker reconciliation, you must use the new ratio going forward, but you do not have to retroactively change clinker production rates previously estimated.

(iii) [Reserved]

(2) Determine, record, and maintain a record of the accuracy of the system of measuring hourly clinker production (or feed mass flow if applicable) before initial use (for new sources) or by the effective compliance date of this rule (for existing sources). During each quarter of source operation, you must determine, record, and maintain a record of the ongoing accuracy of the system of measuring hourly clinker production (or feed mass flow).

(3) If you measure clinker production directly, record the daily clinker production rates; if you measure the kiln feed rates and calculate clinker production, record the hourly kiln feed and clinker production rates.

(4) Develop an emissions monitoring plan in accordance with paragraphs (p)(1) through (p)(4) of this section.

* * * * *

(f) *Opacity Monitoring Requirements.* If you are subject to a limitation on opacity under § 63.1345, you must conduct required opacity monitoring in accordance with the provisions of paragraphs (f)(1)(i) through (vii) of this section and in accordance with your monitoring plan developed under § 63.1350(p). You must also develop an opacity monitoring plan in accordance with paragraphs (p)(1) through (4) and paragraph (o)(5), if applicable, of this section.

(1) * * *

(iv) If visible emissions are observed during any Method 22 performance test, of appendix A–7 to part 60 of this chapter, you must conduct 30 minutes of opacity observations, recorded at 15-second intervals, in accordance with Method 9 of appendix A–4 to part 60 of this chapter. The Method 9 performance test, of appendix A–4 to part 60 of this chapter, must begin within 1 hour of any observation of visible emissions.

(v) Any totally enclosed conveying system transfer point, regardless of the location of the transfer point is not required to conduct Method 22 visible emissions monitoring under this paragraph. The enclosures for these transfer points must be operated and maintained as total enclosures on a continuing basis in accordance with the facility operations and maintenance plan.

(vi) If any partially enclosed or unenclosed conveying system transfer point is located in a building, you must conduct a Method 22 performance test, of appendix A–7 to part 60 of this chapter, according to the requirements of paragraphs (f)(1)(i) through (iv) of this section for each such conveying system transfer point located within the building, or for the building itself, according to paragraph (f)(1)(vii) of this section.

* * * * *

(2)(i) For a raw mill or finish mill, you must monitor opacity by conducting daily visible emissions observations of the mill sweep and air separator PM control devices (PMCD) of these affected sources in accordance with the procedures of Method 22 of appendix A–7 to part 60 of this chapter. The duration of the Method 22 performance test must be 6 minutes.

* * * * *

(iii) If visible emissions are observed during the follow-up Method 22 performance test required by paragraph (f)(2)(ii) of this section from any stack from which visible emissions were observed during the previous Method 22 performance test required by paragraph (f)(2)(i) of the section, you must then conduct an opacity test of each stack from which emissions were observed during the follow up Method 22 performance test in accordance with Method 9 of appendix A–4 to part 60 of this chapter. The duration of the Method 9 test must be 30 minutes.

(3) If visible emissions are observed during any Method 22 visible emissions test conducted under paragraphs (f)(1) or (2) of this section, you must initiate, within one-hour, the corrective actions specified in your operation and maintenance plan as required in § 63.1347.

(4) The requirements under paragraph (f)(2) of this section to conduct daily Method 22 testing do not apply to any specific raw mill or finish mill equipped with a COMS or BLDS.

(i) If the owner or operator chooses to install a COMS in lieu of conducting the daily visible emissions testing required under paragraph (f)(2) of this section, then the COMS must be installed at the outlet of the PM control device of the raw mill or finish mill and the COMS must be installed, maintained, calibrated, and operated as required by the general provisions in subpart A of this part and according to PS–1 of appendix B to part 60 of this chapter.

(ii) If you choose to install a BLDS in lieu of conducting the daily visible emissions testing required under paragraph (f)(2) of this section, the requirements in paragraphs (m)(1) through (m)(4), (m)(10) and (m)(11) of this section apply.

(g) * * *

(1) You must install, calibrate, maintain, and continuously operate a CMS to record the temperature of the exhaust gases from the kiln and alkali bypass, if applicable, at the inlet to, or upstream of, the kiln and/or alkali bypass PMCDs.

* * * * *

(2) You must monitor and continuously record the temperature of the exhaust gases from the kiln and alkali bypass, if applicable, at the inlet to the kiln and/or alkali bypass PMCD.

* * * * *

(4) Calculate the rolling three-hour average temperature using the average of 180 successive one-minute average temperatures. See § 63.1349(b)(3).

* * * * *

(h) * * *

(1) * * *

(ii) Each hour, calculate the three-hour rolling average activated carbon injection rate for the previous three hours of process operation. See § 63.1349(b)(3).

* * * * *

(i) * * *

(1) You must install, operate, and maintain a THC continuous emission monitoring system in accordance with Performance Specification 8A of appendix B to part 60 of this chapter and comply with all of the requirements for continuous monitoring systems found in the general provisions, subpart A of this part. The owner or operator must operate and maintain each CEMS according to the quality assurance requirements in Procedure 1 of appendix F in part 60 of this chapter.

(2) Performance tests on alkali bypass and coal mill stacks must be conducted using Method 25A in appendix A to 40 CFR part 60 and repeated annually.

* * * * *

(k) *Mercury Monitoring Requirements.* If you have a kiln subject to an emissions limitation on mercury emissions, you must install and operate a mercury continuous emissions monitoring system (Hg CEMS) in accordance with Performance Specification 12A (PS 12A) of appendix B to part 60 of this chapter or an integrated sorbent trap monitoring system in accordance with Performance Specification 12B (PS 12B) of appendix B to part 60 of this chapter. You must monitor mercury continuously according to paragraphs (k)(1) through (5) of this section. You must also develop an emissions monitoring plan in accordance with paragraphs (p)(1) through (4) of this section.

(1) You must use a span value for any Hg CEMS that represents the mercury concentration corresponding to approximately two times the emissions standard and may be rounded up to the nearest multiple of 5 $\mu g/m^3$ of total mercury or higher level if necessary to include Hg concentrations which may occur (excluding concentrations during in-line raw ‘‘mill off’’ operation). As specified in PS 12A, Section 6.1.1, the data recorder output range must include the full range of expected Hg concentration values which would include those expected during ‘‘mill off’’ conditions. Engineering judgments made and calculations used to determine the corresponding span concentration from the emission standard shall be documented in the site-specific monitoring plan and associated records.

(2) In order to quality assure data measured above the span value, you must use one of the two options in paragraphs (k)(2)(i) and (ii) of this section.

(i) Include a second span that encompasses the Hg emission concentrations expected to be encountered during ‘‘mill off’’ conditions. This second span may be rounded to a multiple of 5 $\mu g/m^3$ of total mercury. The requirements of PS 12A, shall be followed for this second span with the exception that a RATA with the mill off is not required.

(ii) Quality assure any data above the span value established in paragraph (k)(1) of this section using the following procedure. Any time two consecutive one-hour average measured concentration of Hg exceeds the span value you must, within 24 hours before or after, introduce a higher, ‘‘above span’’ Hg reference gas standard to the Hg CEMS. The ‘‘above span’’ reference gas must meet the requirements of PS 12A, Section 7.1, must be of a concentration level between 50 and 150 percent of the highest hourly concentration measured during the period of measurements above span, and must be introduced at the probe. Record and report the results of this procedure as you would for a daily calibration. The ‘‘above span’’ calibration is successful if the value measured by the Hg CEMS is within 20 percent of the certified value of the reference gas. If the value measured by the Hg CEMS exceeds 20 percent of the certified value of the reference gas, then you must normalize the one-hour average stack gas values measured above the span during the 24-hour period preceding or following the ''above span'' calibration for reporting based on the Hg CEMS response to the reference gas as shown in equation 19:

$$\frac{\text{Certified reference gas value}}{\text{Measured value of reference gas}} \times \text{Measured stack gas result} = \text{Normalized stack gas result} \qquad \text{(Eq. 19)}$$

Only one 'above span' calibration is needed per 24 hour period.

(3) You must operate and maintain each Hg CEMS or an integrated sorbent trap monitoring system according to the quality assurance requirements in Procedure 5 of appendix F to part 60 of this chapter. During the RATA of integrated sorbent trap monitoring systems required under Procedure 5, you may apply the appropriate exception for sorbent trap section 2 breakthrough in (k)(3)(i) through (iv) of this section:

(i) For stack Hg concentrations >1 µg/dscm, ≤10% of section 1 mass;

(ii) For stack Hg concentrations ≤1 µg/dscm and >0.5 µg/dscm, ≤20% of section 1 mass;

(iii) For stack Hg concentrations ≤0.5 µg/dscm and >0.1 µg/dscm, ≤50% of section 1 mass; and

(iv) For stack Hg concentrations ≤0.1 µg/dscm, no breakthrough criterion assuming all other QA/QC specifications are met.

(4) Relative accuracy testing of mercury monitoring systems under PS 12A, PS 12B, or Procedure 5 must be conducted at normal operating conditions. If a facility has an inline raw mill, the testing must occur with the raw mill on.

(5) If you use a Hg CEMS or an integrated sorbent trap monitoring system, you must install, operate, calibrate, and maintain an instrument for continuously measuring and recording the exhaust gas flow rate to the atmosphere according to the requirements in paragraphs (n)(1) through (10) of this section. If kiln gases are diverted through an alkali bypass or to a coal mill and exhausted through separate stacks, you must account for the mercury emitted from those stacks by following the procedures in (k)(5)(i) through (iv) of this section:

(i) Develop a mercury hourly mass emissions rate by conducting annual performance tests using Method 29, or Method 30B, to measure the concentration of mercury in the gases exhausted from the alkali bypass and coal mill.

(ii) On a continuous basis, determine the mass emissions of mercury in lb/hr from the alkali bypass and coal mill exhausts by using the mercury hourly emissions rate, the exhaust gas flow rate and hourly mercury emission rate to calculate hourly mercury emissions in lb/hr.

(iii) Sum the hourly mercury emissions from the kiln, alkali bypass and coal mill to determine total mercury emissions. Using hourly clinker production, calculate the hourly emissions rate in pounds per ton of clinker to determine your 30 day rolling average.

(iv) If mercury emissions from the coal mill are below the method detection limit for two consecutive annual performance tests, you may reduce the frequency of the performance tests of coal mills to once every 30 months. If the measured mercury concentration exceeds the method detection limit, you must revert to testing annually until two consecutive annual tests are below the method detection limit.

(6) If you operate an integrated sorbent trap monitoring system conforming to PS 12B, you may use a monitoring period at least 24 hours but no longer than 168 hours in length. You should use a monitoring period that is a multiple of 24 hours (except during relative accuracy testing as allowed in PS 12B).

(l) *HCl Monitoring Requirements.* If you are subject to an emissions limitation on HCl emissions in § 63.1343, you must monitor HCl emissions continuously according to paragraph (l)(1) or (2) and paragraphs (m)(1) through (4) of this section or, if your kiln is controlled using a wet or dry scrubber or tray tower, you alternatively may parametrically monitor SO_2 emissions continuously according to paragraph (l)(3) of this section. You must also develop an emissions monitoring plan in accordance with paragraphs (p)(1) through (4) of this section.

(1) If you monitor compliance with the HCl emissions limit by operating an HCl CEMS, you must do so in accordance with Performance Specification 15 (PS 15) of appendix B to part 60 of this chapter, or, upon promulgation, in accordance with any other performance specification for HCl CEMS in appendix B to part 60 of this chapter. You must operate, maintain, and quality assure a HCl CEMS installed and certified under PS 15 according to the quality assurance requirements in Procedure 1 of appendix F to part 60 of this chapter except that the Relative Accuracy Test Audit requirements of Procedure 1 must be replaced with the validation requirements and criteria of sections 11.1.1 and 12.0 of PS 15. If you install and operate an HCl CEMS in accordance with any other performance specification for HCl CEMS in appendix B to part 60 of this chapter, you must operate, maintain and quality assure the HCl CEMS using the procedure of appendix F to part 60 of this chapter applicable to the performance specification. You must use Method 321 of appendix A to part 63 of this chapter as the reference test method for conducting relative accuracy testing. The span value and calibration requirements in paragraphs (l)(1)(i) and (ii) of this section apply to HCl CEMS other than those installed and certified under PS 15.

(i) You must use a span value for any HCl CEMS that represents the intended upper limit of the HCl concentration measurement range during normal inline raw ''mill on'' operation. The span value should be a concentration equivalent to approximately two times the emissions standard and it may be rounded to the nearest multiple of 5 ppm of HCl. The HCl CEMS data recorder output range must include the full range of expected HCl concentration values which would include those expected during ''mill off'' conditions. Engineering judgments made and calculations used to determine the corresponding span concentration from the emission standard shall be documented in the site-specific monitoring plan and associated records.

(ii) In order to quality assure data measured above the span value, you must use one of the two options in paragraphs (l)(1)(ii)(A) and (B) of this section.

(A) Include a second span that encompasses the HCl emission concentrations expected to be encountered during ‘‘mill off’’ conditions. This second span may be rounded to a multiple of 5 µg/m³ of total HCl. The requirements of the appropriate HCl monitor performance specification, shall be followed for this second span with the exception that a RATA with the mill off is not required.

(B) Quality assure any data above the span value established in paragraph (1)(1)(i) of this section using the following procedure. Any time the average measured concentration of HCl exceeds or is expected to exceed the span value for greater than two hours you must, within a period 24 hours before or after the ‘above span’ period, introduce a higher, ‘above span’ HCl reference gas standard to the HCl CEMS. The ‘above span’ reference gas must meet the requirements of the applicable performance specification and be of a concentration level between 50 and 100 percent of the highest hourly concentration measured during the period of measurements above span, and must be introduced at the probe. Record and report the results of this procedure as you would for a daily calibration. The ‘above span’ calibration is successful if the value measured by the HCl CEMS is within 20 percent of the certified value of the reference gas. If the value measured by the HCl CEMS is not within 20 percent of the certified value of the reference gas, then you must normalize the stack gas values measured above span as described in paragraph (l)(1)(ii)(C) below. If the ‘above span’ calibration is conducted during the period when measured emissions are above span and there is a failure to collect the required minimum number of data points in an hour due to the calibration duration, then you must determine the emissions average for that missed hour as the average of hourly averages for the hour preceding the missed hour and the hour following the missed hour.

(C) In the event that the ‘above span’ calibration is not successful (i.e., the HCl CEMS measured value is not within 20 percent of the certified value of the reference gas), then you must normalize the one-hour average stack gas values measured above the span during the 24-hour period preceding or following the ‘above span’ calibration for reporting based on the HCl CEMS response to the reference gas as shown in Equation 20:

$$\frac{\text{Certified reference gas value}}{\text{Measured value of reference gas}} \times \text{Measured stack gas result} = \text{Normalized stack gas result} \qquad \text{(Eq. 20)}$$

Only one ‘above span’ calibration is needed per 24-hour period.

(2) Install, operate, and maintain a CMS to monitor wet scrubber or tray tower parameters, as specified in paragraphs (m)(5) and (7) of this section, and dry scrubber, as specified in paragraph (m)(9) of this section.

(3) If the source is equipped with a wet or dry scrubber or tray tower, and you choose to monitor SO_2 emissions, monitor SO_2 emissions continuously according to the requirements of § 60.63(e) through (f) of part 60 subpart F of this chapter. If SO_2 levels increase above the 30-day rolling average SO_2 operating limit established during your performance test, you must:

(i) As soon as possible but no later than 48 hours after you exceed the established SO_2 value conduct an inspection and take corrective action to return the SO_2 emissions to within the operating limit; and

(ii) Within 60 days of the exceedance or at the time of the next compliance test, whichever comes first, conduct an HCl emissions compliance test to determine compliance with the HCl emissions limit and to verify or re-establish the SO_2 CEMS operating limit.

(m) *Parameter Monitoring Requirements.* If you have an operating limit that requires the use of a CMS, you must install, operate, and maintain each continuous parameter monitoring system (CPMS) according to the procedures in paragraphs (m)(1) through (4) of this section by the compliance date specified in § 63.1351. You must also meet the applicable specific parameter monitoring requirements in paragraphs (m)(5) through (11) that are applicable to you.

* * * * *

(3) Determine the 1-hour block average of all recorded readings.

* * * * *

(7) * * *

(i) Locate the pH sensor in a position that provides a representative measurement of wet scrubber or tray tower effluent pH.

* * * * *

(9) *Mass Flow Rate (for Sorbent Injection) Monitoring Requirements.* If you have an operating limit that requires the use of equipment to monitor sorbent injection rate (*e.g.,* weigh belt, weigh hopper, or hopper flow measurement device), you must meet the requirements in paragraphs (m)(9)(i) through (iii) of this section. These requirements also apply to the sorbent injection equipment of a dry scrubber.

* * * * *

(10) *Bag leak detection monitoring requirements.* If you elect to use a fabric filter bag leak detection system to comply with the requirements of this subpart, you must install, calibrate, maintain, and continuously operate a BLDS as specified in paragraphs (m)(10)(i) through (viii) of this section.

(i) You must install and operate a BLDS for each exhaust stack of the fabric filter.

(ii) Each BLDS must be installed, operated, calibrated, and maintained in a manner consistent with the manufacturer's written specifications and recommendations and in accordance with the guidance provided in EPA–454/R–98–015, September 1997.

(iii) The BLDS must be certified by the manufacturer to be capable of detecting PM emissions at concentrations of 10 or fewer milligrams per actual cubic meter.

(iv) The BLDS sensor must provide output of relative or absolute PM loadings.

(v) The BLDS must be equipped with a device to continuously record the output signal from the sensor.

(vi) The BLDS must be equipped with an alarm system that will alert an operator automatically when an increase in relative PM emissions over a preset level is detected. The alarm must be located such that the alert is detected and recognized easily by an operator.

(vii) For positive pressure fabric filter systems that do not duct all compartments of cells to a common stack, a BLDS must be installed in each baghouse compartment or cell.

* * * * *

(11) * * *

(v) Cleaning the BLDS probe or otherwise repairing the BLDS; or

* * * * *

(n) *Continuous Flow Rate Monitoring System.* You must install, operate, calibrate, and maintain instruments, according to the requirements in paragraphs (n)(1) through (10) of this section, for continuously measuring and recording the stack gas flow rate to allow determination of the pollutant mass emissions rate to the atmosphere from sources subject to an emissions limitation that has a pounds per ton of clinker unit.

* * * * *

(o) *Alternate Monitoring Requirements Approval.* You may submit an application to the Administrator for approval of alternate monitoring requirements to demonstrate compliance with the emission standards of this subpart, except for emission standards for THC, subject to the provisions of paragraphs (o)(1) through (6) of this section.

* * * * *

(p) *Development and Submittal (Upon Request) of Monitoring Plans.* If you demonstrate compliance with any applicable emissions limit through performance stack testing or other emissions monitoring, you must develop a site-specific monitoring plan according to the requirements in paragraphs (p)(1) through (4) of this section. This requirement also applies to you if you petition the EPA Administrator for alternative monitoring parameters under paragraph (o) of this section and § 63.8(f). If you use a BLDS, you must also meet the requirements specified in paragraph (p)(5) of this section.

(1) For each CMS required in this section, you must develop, and submit to the permitting authority for approval upon request, a site-specific monitoring plan that addresses paragraphs (p)(1)(i) through (iii) of this section. You must submit this site-specific monitoring plan, if requested, at least 30 days before your initial performance evaluation of your CMS.

* * * * *

(2) In your site-specific monitoring plan, you must also address paragraphs (p)(2)(i) through (iii) of this section.

* * * * *

(5) *BLDS Monitoring Plan.* Each monitoring plan must describe the items in paragraphs (p)(5)(i) through (v) of this section. At a minimum, you must retain records related to the site-specific monitoring plan and information discussed in paragraphs (m)(1) through (4), (m)(10) and (11) of this section for a period of 5 years, with at least the first 2 years on-site;

* * * * *

■ 19. Section 63.1351 is amended by revising paragraphs (c) and (d) and adding paragraph (e) to read as follows:

§ 63.1351 Compliance dates.

* * * * *

(c) The compliance date for existing sources for all the requirements that became effective on February 12, 2013, except for the open clinker pile requirements will be September 9, 2015.

(d) The compliance date for new sources is February 12, 2013, or startup, whichever is later.

(e) The compliance date for existing sources with the requirements for open clinker storage piles in § 63.1343(c) is February 12, 2014.

■ 20. Section 63.1352 is amended by revising paragraph (b) to read as follows:

§ 63.1352 Additional test methods.

* * * * *

(b) Owners or operators conducting tests to determine the rates of emission of specific organic HAP from raw material dryers, and kilns at Portland cement manufacturing facilities, solely for use in applicability determinations under § 63.1340 of this subpart are permitted to use Method 320 of appendix A to this part, or Method 18 of appendix A to part 60 of this chapter.

■ 21. Section 63.1353 is amended by adding paragraph (b)(6) to read as follows:

§ 63.1353 Notification Requirements.

* * * * *

(b) * * *

(6) Within 48 hours of an exceedance that triggers retesting to establish compliance and new operating limits, notify the appropriate permitting agency of the planned performance tests. The notification requirements of §§ 63.7(b) and 63.9(e) do not apply to retesting required for exceedances under this subpart.

■ 22. Section 63.1354 is amended by:

■ a. Removing and reserving paragraphs (b)(4) and (5);

■ b. Revising paragraph (b)(9)(vi);

■ c. Adding paragraph (b)(9)(vii); and

■ d. Revising paragraph (c).

The revisions read as follows:

§ 63.1354 Reporting requirements.

* * * * *

(b) * * *

(9) * * *

(vi) For each PM, HCl, Hg, and THC CEMS or Hg sorbent trap monitoring system, within 60 days after the reporting periods, you must submit reports to the EPA's WebFIRE database by using the Compliance and Emissions Data Reporting Interface (CEDRI) that is accessed through the EPA's Central Data Exchange (CDX) (*www.epa.gov/cdx*). You must use the appropriate electronic reporting form in CEDRI or provide an alternate electronic file consistent with the EPA's reporting form output format. For each reporting period, the reports must include all of the calculated 30-operating day rolling average values derived from the CEMS or Hg sorbent trap monitoring systems.

(vii) In response to each violation of an emissions standard or established operating parameter limit, the date, duration and description of each violation and the specific actions taken for each violation including inspections, corrective actions and repeat performance tests and the results of those actions.

* * * * *

(c) Reporting a failure to meet a standard due to a malfunction. For each failure to meet a standard or emissions limit caused by a malfunction at an affected source, you must report the failure in the semi-annual compliance report required by § 63.1354(b)(9). The report must contain the date, time and duration, and the cause of each event (including unknown cause, if applicable), and a sum of the number of events in the reporting period. The report must list for each event the affected source or equipment, an estimate of the volume of each regulated pollutant emitted over the emission limit for which the source failed to meet a standard, and a description of the method used to estimate the emissions. The report must also include a description of actions taken by an owner or operator during a malfunction of an affected source to minimize emissions in accordance with § 63.1348(d), including actions taken to correct a malfunction.

■ 23. Section 63.1355 is amended by revising paragraphs (f) and (g)(1) and adding paragraph (h) to read as follows:

§ 63.1355 Recordkeeping Requirements.

* * * * *

(f) You must keep records of the date, time and duration of each startup or shutdown period for any affected source that is subject to a standard during startup or shutdown that differs from the standard applicable at other times, and the quantity of feed and fuel used during the startup or shutdown period.

(g)(1) You must keep records of the date, time and duration of each malfunction that causes an affected source to fail to meet an applicable standard; if there was also a monitoring malfunction, the date, time and duration of the monitoring malfunction; the record must list the affected source or equipment, an estimate of the volume of each regulated pollutant emitted over the standard for which the source failed to meet a standard, and a description of the method used to estimate the emissions.

* * * * *

(h) For each exceedance from an emissions standard or established operating parameter limit, you must keep records of the date, duration and description of each exceedance and the specific actions taken for each exceedance including inspections, corrective actions and repeat performance tests and the results of those actions.

■ 24. Section 63.1356 is revised to read as follows:

§ 63.1356 Sources with multiple emissions limit or monitoring requirements.

If an affected facility subject to this subpart has a different emissions limit or requirement for the same pollutant under another regulation in title 40 of this chapter, the owner or operator of the affected facility must comply with the most stringent emissions limit or requirement and is exempt from the less stringent requirement.

■ 25. Section 63.1357 is amended by revising paragraphs (a)(1) and (2) to read as follows:

§ 63.1357 Temporary, conditioned exemption from particulate matter and opacity standards.

(a) * * *

(1) Any PM and opacity standards of part 60 or part 63 of this chapter that are applicable to cement kilns and clinker coolers.

(2) Any permit or other emissions or operating parameter or other limitation on workplace practices that are applicable to cement kilns and clinker coolers to ensure compliance with any PM and opacity standards of this part or part 60 of this chapter.

* * * * *

■ 26. Table 3 to Subpart LLL of Part 63 is revised by revising the entries for 63.6(e)(3), 63.7(b), and 63.9(e) to read as follows:

TABLE 3—TO SUBPART LLL OF PART 63—APPLICABILITY OF GENERAL PROVISIONS

Citation	Requirement	Applies to Subpart LLL	Explanation
*	*	*	* * * *
63.6(e)(3)	Startup, Shutdown Malfunction Plan	No	Your operations and maintenance plan must address periods of startup and shutdown. See § 63.1347(a)(1).
*	*	*	* * * *
63.7(b)	Notification period	Yes	Except for repeat performance test caused by an exceedance. See § 63.1353(b)(6)
*	*	*	* * * *
63.9(e)	Notification of performance test	Yes	Except for repeat performance test caused by an exceedance. See § 63.1353(b)(6)
*	*	*	* * * *

[FR Doc. 2012–31633 Filed 2–11–13; 8:45 am]

BILLING CODE 6560–50–P

Exhibit B

EARTHJUSTICE

ALASKA CALIFORNIA FLORIDA MID-PACIFIC NORTHEAST NORTHERN ROCKIES
NORTHWEST ROCKY MOUNTAIN WASHINGTON, DC INTERNATIONAL

April 5, 2013

Bob Perciasepe
Acting Administrator
U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, N. W.
Mail Code: 1101A
Washington, DC 20460

Re: Request for Stay Pending Judicial Review of Portions of National Emission Standards for Hazardous Air Pollutants for the Portland Cement Manufacturing Industry (78 Fed. Reg. 10,006 (Feb. 12, 2013)

BY MAIL AND E-MAIL

Dear Administrator Perciasepe:

This is a petition to stay, pending judicial review, the effectiveness of the final action taken by EPA at 78 Fed. Reg. 10,006 (February 12, 2013) and entitled "National Emission Standards for Hazardous Air Pollutants for the Portland Cement Manufacturing Industry" ("2013 Delay Rule"). The parties submitting this petition are Sierra Club, 85 Second St., 2nd Floor, San Francisco, California 94105, (415) 977-5500; Cape Fear River Watch, 617 Surrey St., Wilmington, North Carolina 28401, (910) 762-5605; Citizens' Environmental Coalition, 33 Central Ave, 3rd Floor, Albany, New York 12210, (518) 462-5527; Desert Citizens Against Pollution, P.O. Box 845, Rosamond, California 93560, (661) 273-3098; Downwinders At Risk, PO Box 763844, Dallas, Texas 75376, (972) 230-3185; Friends of Hudson, Box 326, Hudson, New York 12534, (518) 822-0334; Huron Environmental Activist League, PO Box 302, Alpena, Michigan 49707, (989) 356-6047; Montanans Against Toxic Burning, PO Box 1082, Bozeman, Montana 59771, (406) 586-6067; and PenderWatch and Conservancy, PO Box 662, Hampstead, North Carolina 28443, (910) 382-4677. Petitioners specifically request that you stay the effectiveness of (1) the weakened particulate matter standard and (2) the two-year delay of the compliance date for existing Portland cement plants.

As explained below, the parties submitting this petition do not believe EPA has authority to stay Clean Air Act rules except in accordance with Clean Air Act § 307(d)(7)(B), 42 U.S.C. § 7607(d)(7)(B). EPA, however, has taken the position that it can also stay Clean Air Act rules pending judicial review pursuant to § 705 of the Administrative Procedure Act, 5 U.S.C.

§ 705, and the Federal Rules of Appellate Procedure state, "A petitioner must ordinarily move first before the agency for a stay pending review of its decision or order," Fed. R. App. P. 18(a)(1). This petition for a stay is filed as a precautionary measure to comply with Rule 18. Because the 2013 Delay Rule is illegal and arbitrary, and will cause Petitioners irreparable harm, and because a stay is in the public interest and will not harm other parties, a stay pending judicial review is warranted here assuming *arguendo* that EPA has authority to grant one.

We further request that the agency act immediately on this request. Because of the rule's illegality and harmful effects, we have filed a petition for review in the U.S. Court of Appeals for the District of Columbia Circuit. *Sierra Club v. EPA*, No. 13-1112 (D.C. Cir. Apr. 5, 2013). If EPA does not issue an administrative stay, we will seek a stay from the Court. Thus, please inform the undersigned counsel by April 15, 2013, whether the agency will grant our request for a stay.

BACKGROUND

The Clean Air Act ("CAA") required EPA to establish lawful standards for all the hazardous air pollutants that cement plants emit by, at the very latest, November 15, 1997. 42 U.S.C. § 7412(d)-(e); 58 Fed. Reg. 63,941, 63,954/1 (Dec. 3, 1993) (setting deadline); *see, e.g., National Lime Ass'n v. EPA*, 233 F.3d 625, 634 (D.C. Cir. 2000). When EPA first promulgated § 112 regulations for cement plants in 1998, the agency refused to set standards for many of the hazardous air pollutants that cement plants emit, including mercury, acid gases such as hydrogen chloride, and organic pollutants such as benzene. The D.C. Circuit found that EPA's failure to set emission standards for listed hazardous air pollutants violated the Clean Air Act, and remanded the regulations to EPA with instructions to set the required standards. *National Lime*, 233 F.3d at 641. Finally, in 2010, EPA set standards for cement plants' mercury, particulate matter, hydrogen chloride ("HCl"), and total hydrocarbons ("THC") emissions. 75 Fed. Reg. 54,970 (Sept. 9, 2010) ("2010 rule"); *see Portland Cement Ass'n v. EPA*, 665 F.3d 177, 188-89 (D.C. Cir. 2011). EPA gave existing cement plants three years to come into compliance with these standards, until September 9, 2013—the maximum amount of time the Act allows. 42 U.S.C. § 7412(i)(3)(A); 75 Fed. Reg. at 55,063/3 (codified at 40 C.F.R. § 63.1351(b)); *see also* 76 Fed. Reg. 2832, 2837/1 (Jan. 18, 2011) (codified at 40 C.F.R. § 63.1351(c)) (direct final rule amending compliance deadlines) ("The compliance date for existing sources for all the requirements that became effective on November 8, 2010 will be September 9, 2013."). EPA estimated that the standards would prevent 960-2,500 premature deaths each year, once cement plants started meeting them. EPA, *Regulatory Impacts Analysis* 6-15 tbl.6-3 (EPA-HQ-OAR-2002-0051-3477, Aug. 2010) ("EPA, *RIA*").

The Portland Cement Association and individual cement companies filed petitions for reconsideration and challenged the 2010 rule on multiple grounds; EPA granted in part and denied in part the petitions for reconsideration. 76 Fed. Reg. 28,318 (May 17, 2011) ("denial of reconsideration rule"). The Court found that EPA's refusal to reconsider the inclusion of data from kilns that burn solid waste (and thus are technically commercial or industrial solid waste incinerators ("CISWI")) was arbitrary. *Portland Cement*, 665 F.3d at 184-89. The Court noted that standards would likely not change much, and denied the companies' request for a stay of all the standards. *Id.* at 189. It otherwise upheld EPA's regulations of cement plants. *Id.* at 182.

EPA completed its reconsideration about a year after the Court's judgment and indeed left intact much of the 2010 rule's standards. 78 Fed. Reg. 10,006 (signed Dec. 20, 2012). Of the four pollutants affected by the removal of CISWI units from the pool of sources, EPA left the standards for three unchanged. *Id.* at 10,026/2-3. But it weakened the PM standards (for new sources) from 0.01 lb/ton clinker (30-day average) to 0.02 lb/ton clinker (stack test), and (for existing sources) from 0.04 lb/ton clinker to 0.07 lb/ton clinker. *Id.* Even though there is no logical reason that plants must alter their compliance strategies to meet the unchanged or loosened standards, EPA also extended the compliance date for existing sources by two years, to September 9, 2015. 78 Fed. Reg. at 10,053/2 (codified at 40 C.F.R. § 63.1351(c)). EPA still estimates that once all plants comply with the standards, 960-2,500 premature deaths will be prevented per year. *See id.* at 10,029/3.

ARGUMENT

Petitioners do not believe EPA has authority to stay the effective date of Clean Air Act rules except "for a period not to exceed three months" pending reconsideration proceedings pursuant to Clean Air Act § 307(d)(7)(B). A recent decision in the U.S. District Court for the District of Columbia, however, holds that EPA may stay Clean Air Act rules pending judicial review under 5 U.S.C. § 705. *Sierra Club v. Jackson*, 833 F. Supp. 2d 11, 23-26 (D.D.C. 2012). Assuming *arguendo* that EPA has such authority, a stay's issuance depends on balancing four factors: (1) the likelihood of success on the merits of the petitioners' claims; (2) whether the petitioners will suffer irreparable harm without a stay; (3) whether a stay will substantially harm other parties; and (4) the public interest. *See, e.g., Davis v. Pension Benefit Guar. Corp.*, 571 F.3d 1288, 1291 (D.C. Cir. 2009); *Washington Area Metro. Transit Comm'n v. Holiday Tours*, 559 F.2d 841, 843 (D.C. Cir. 1977); *see also Sierra Club*, 833 F. Supp. 2d at 30 ("the standard for a stay at the agency level is the same as the standard for a stay at the judicial level: each is governed by the four-part preliminary injunction test applied in this Circuit."). Here, each factor cuts in favor of a stay.

I. PETITIONERS' CLAIMS ARE LIKELY TO SUCCEED ON THE MERITS.

The 2013 Delay Rule violates the plain meaning of the Clean Air Act in at least three independent ways. First, it contravenes § 112(i)(3)(A)'s requirement that compliance dates "shall provide for compliance as expeditiously as practicable" and unlawfully extends the compliance deadline for existing sources beyond the outer limit set in that provision. 42 U.S.C. § 7412(i)(3)(A). Second, it contravenes Clean Air Act § 112(d)(7)'s prohibition on weakening lawfully established standards. *See id.* § 7412(d)(7). Finally, the PM standard for existing and new sources violate Clean Air Act § 112(d)(2)-(3)'s stringency requirements. *See id.* § 7412(d)(2)-(3).

A. The 2013 Delay Rule Contravenes § 112(i)(3)(A).

The Act requires existing sources to come into compliance with emission standards "as expeditiously as practicable, but in no event later than 3 years after the effective date of such standard" (subject to limited exceptions). *Id.* § 7412(i)(3)(A); *see also id.* § 7412(i)(3)(B), (i)(4)-(6) (exceptions relevant to existing cement plants). The compliance date for the 2010 rule is September 9, 2013. That date reflects the maximum amount of time that EPA could provide for compliance. By requiring compliance within three years at the latest, and by providing for case-by-case extensions of up to one year for plants that need additional time to install controls, Congress made clear its conclusion that plants can comply within three years or less and that any extensions of the compliance date beyond three years should be granted only on a case-by-case basis and only where the permitting authority concludes that such time is "necessary for the installation of controls." *Id.* § 7412(i)(3)(B); *see NRDC v. EPA*, 489 F.3d 1364, 1373-74 (D.C. Cir. 2007).

Since the 2010 rule's promulgation, there have been no changes proposed or finalized to make the standards for plants stricter. The D.C. Circuit left the 2010 rule in place and denied PCA's request for a stay of the entire 2010 rule,[1] meaning that the rule's compliance date has remained applicable for plants continuously since its promulgation nearly two-and-a-half years ago. *Portland Cement*, 665 F.3d at 189. That is, nothing has occurred since the 2010 rule's promulgation either to lift the 2010's rule's applicability or to make it more difficult for cement plants to come into compliance with it: the only relevant change the 2013 Delay Rule made was to weaken the PM standards.

Thus, whatever measures were necessary to comply with the 2010 rule will also bring plants into compliance with the 2013 Delay Rule. Those measures had to bring existing plants into compliance by, at the latest, September 9, 2013. EPA's extension of the compliance deadline thus provides plants with more time than necessary to come into compliance. Consequently, the

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[1] The *Portland Cement* Court stayed only the 2010 rule's standard for clinker storage piles. 665 F.3d at 189. The clinker storage piles are not at issue in this petition for a stay.

extension is barred by Clean Air Act § 112(i)(3)(A)'s requirement that the deadline provide for compliance as expeditiously as possible. 42 U.S.C. § 7412(i)(3)(A).

That the PM standard changed does not authorize or justify a deadline extension. First, the text of § 112(i)(3)(A) requires existing sources to comply with standards "as expeditiously as practicable." *Id.* Contrary to EPA's belief, *see* 78 Fed. Reg. at 10,023/1-24/3, the availability of new, weaker compliance strategies does not mean that it is not "practicable" for plants to comply with either the 2010 standards or the weakened 2013 standards by September 9, 2013. *See Black's Law Dictionary* 1172 (6th ed. 1990) ("practicable" means "that which may be done, practiced, or accomplished; that which is performable, feasible, possible"). Such strategies do not render older strategies unworkable, infeasible, or impossible. EPA's allowing sources more time to do less thus conflicts with the Act.

Second, to the extent that compliance deadline extensions may be legitimately justified for certain kilns, the Act provides for such extensions. *See, e.g.*, 42 U.S.C. § 7412(i)(3)(B) (authorizing EPA or delegated state to extend compliance deadline for an existing source "if such additional period is necessary for the installation of controls"); § 7412(i)(6) (extending source's compliance deadline for pollutants for control of which source has recently installed measures). It is well-established—and, indeed, there is D.C. Circuit case law directly on point—that EPA thus lacks authority to concoct some broader extension. *NRDC*, 489 F.3d at 1374 ("Further, Congress enumerated specific exceptions to the three-year maximum, which indicates that Congress has spoken on the question and has not provided EPA with authority under subsection 112(i)(3)(B) to extend the compliance date in the 2006 rule.").

Finally, EPA's extension premised on weakened standards subverts the Act's compliance deadlines. The D.C. Circuit has soundly rejected an attempt to create "a glaring loophole" in the Act that would have allowed EPA to "continually 'strengthen' a [national ambient air quality standard] by the smallest margin and avoid ever implementing the time-delayed controls mandated by the CAA." *S. Coast Air Quality Mgmt. Dist. v. EPA*, 489 F.3d 1245, 1248 (D.C. Cir. 2007) (upholding in relevant part on denial of rehearing 472 F.3d 882 (D.C. Cir. 2006)). EPA's effort here is more egregious: it does not even provide the fig leaf of strengthening the relevant standards.

B. The 2013 Delay Rule Contravenes § 112(d)(7).

Clean Air Act § 112(d)(7) provides "no emission standard … under this section shall be interpreted, construed or applied to diminish or replace the requirements of a more stringent emission limitation … established pursuant to section 7411 of this title [Clean Air Act § 111], part C or D of this subchapter [the Prevention of Significant Deterioration provisions or the nonattainment area provisions], or other authority of this chapter [i.e., the Clean Air Act] or a standard issued under State authority." 42 U.S.C. § 7412(d)(7) (emphasis added). Because § 112 is an "authority of this chapter" other than those listed, § 112(d)(7) unambiguously precludes EPA from applying new § 112 standards "to diminish or replace the requirements of a more stringent emission limitation" under § 112.

The statutory language precludes EPA's reading of the provision—that it "indicates that a section 112(d) standard does not supplant more stringent standards issued under some authority other than section 112(d)," 78 Fed. Reg. at 10,017/3 (emphasis added). Contrary to EPA's belief, "other authority of this chapter" must refer to authorities other than Clean Air Act § 111 and parts C and D, not other than § 112. "[T]he word 'other' connotes 'existing besides, or distinct from, that already mentioned or implied.'" *Financial Planning Ass'n v. SEC*, 482 F.3d 481, 489 (D.C. Cir. 2007) (citation omitted). In § 112(d)(7), "other authority of this chapter" is the final element of a list referring to authorities within the Clean Air Act. 42 U.S.C. § 7412(d)(7). Section 112(d)(7) makes no reference to § 112, and EPA points to nothing in the provision's language that supports its interpretation. Thus, the structure of the provision indicates that "other authorities of this chapter" means "authorities of this chapter distinct from those already mentioned." *See United States v. Atlantic Research Corp.*, 551 U.S. 128, 134-36 (2007) (using structure of statute to determine that "phrase 'any other person' therefore means any person other than those three [listed]"); *Wolf Run Mining Co. v. FMSHRC*, 659 F.3d 1197, 1203 (D.C. Cir. 2011) (using structure of statute to determine what "'[o]ther' plainly refers to").

Because the 2013 Delay Rule plainly increased the PM standards, EPA has violated Clean Air Act § 112(d)(7). For new sources, they have doubled; for existing sources, almost doubled. 78 Fed. Reg. at 10,026/2. EPA acknowledges that the changes allow for more PM emissions than were allowed in the 2010 rule. *See id.* (PM standards "allow[] slightly more variability"). It estimates that, in 2015, plants will emit an additional 138 tons per year of PM under the 2013 Delay Rule than they would under the 2010 rule. *Id.* at 10,026 tbl.4.

EPA's weakening of the PM standards was not required by the Court's decision in *Portland Cement*. There, the Court remanded for EPA to provide reconsideration of its floors and, in particular, whether EPA should have excluded kilns that burn solid waste from its floor calculations. 665 F.3d at 189. EPA provided reconsideration and proposed new floors that excluded kilns that, in the agency's opinion, burn waste. Under EPA's new floor calculations, the best-performing kiln for PM emissions remained the same as in the 2010 rule. *Compare Final Portland Cement Reconsideration Technical Support Document* app.F (EPA-HQ-OAR-2011-0817-0845, Dec. 20, 2012) (Mitsubishi kiln, in Lucerne Valley, CA, is best-performer for PM), *with Development of the MACT Floors for the Final NESHAP for Portland Cement* 42 app.C (EPA-HQ-OAR-2002-0051-3403, Aug. 6, 2010) (same). As for the existing source PM standard, EPA calculated that removing the CISWI kilns would result in a standard of 0.05 lb/ton clinker. 76 Fed. Reg. at 28,322 tbl.1. EPA also said that, "Given the minimal change in the standards, with the exception of [an increase (which proved unnecessary) in stringency of the THC standards], kilns' compliance strategy would be unaltered." *Id.* at 28,322/3.

Even though the reconsideration mandated by *Portland Cement* did not result in any change to the PM floor for new kilns, EPA doubled the PM standard from 0.01 lb/ton of clinker to 0.02 lb/ton of clinker. Similarly, even though the reconsideration mandated by *Portland Cement* resulted in only a minor change to the PM standard for existing kilns (from 0.04 lb/ton of clinker to 0.05 lb/ton of clinker), EPA increased the PM standard for existing kilns far more, to 0.07 lb/ton clinker. Thus, the changes to the PM standard that EPA promulgated in the 2013 Delay Rule are not the result of a court order or a valid reconsideration process, but simply an elective decision by EPA to weaken these standards. Clean Air Act § 112(d)(7) unambiguously bars such actions.

Further, the compliance date extension contravenes § 112(d)(7) in two ways. First, by delaying the date by which existing sources must comply with standards, it manifestly weakens "a more stringent … applicable requirement established pursuant to" a Clean Air Act authority. 42 U.S.C. § 7412(d)(7). Second, because the weakened PM standard was the stated basis for extending the existing source compliance date, but the weakened standard is itself unlawful under § 112(d)(7), EPA lacks any basis for extending the compliance date.

C. The 2013 Delay Rule Contravenes § 112(d)(2)-(3).

EPA's revised PM standards also violate § 112(d)(3) and binding D.C. Circuit precedent. EPA has set its revised floors for existing plants at the 99% upper prediction limit ("UPL"), which is the number EPA expects any future test by any source in the top twelve percent of sources for which it has emissions information to fall below. Because Clean Air Act § 112 unambiguously requires EPA to set floors reflecting the "average" emission level achieved by the best sources, setting floors that instead reflect a UPL for those sources is unlawful. *See* 42 U.S.C. § 7412(d)(3). By insisting that it can set floors at this level, EPA deprives the word "average" of meaning and substitutes its own policy preferences for Congress's plainly expressed intent. *See New York v. EPA*, 443 F.3d 880, 885 (D.C. Cir. 2006) ("courts must give effect to each word of a statute"); *New Jersey v. EPA*, 517 F.3d 574, 582 (D.C. Cir. 2008) (rejecting statutory reading that "substitut[es] EPA's desires for the plain text" of the statute).

By claiming that it can use the UPL for all sources in the top twelve percent, EPA also misreads its authority to consider variability under the Clean Air Act and relevant case law. Although EPA may consider variability in estimating an individual source's actual performance over time, nothing in the Act or the case law even suggests that the agency may account for differences in performance between sources except as § 112 provides, by averaging the emission levels achieved by the sources in the top twelve percent. Indeed, EPA errs by viewing the different emission levels achieved by different sources as "variability" at all. The different emission levels achieved by different sources are just differences in performance and provide no basis for applying statistical methods. Thus, EPA has not made the necessary showing there is a reasonable connection between the UPL and what the best performers actually achieve. *See, e.g.*, *Ne. Md. Waste Disposal Auth. v. EPA*, 358 F.3d 936, 954 (D.C. Cir. 2004) ("EPA must demonstrate with substantial evidence—not mere assertions that the chosen floors represent a reasonable estimate of the performance of the best-performing units." (alteration marks and internal quotation marks omitted; quoting *Cement Kiln Recycling Coal. v. EPA*, 255 F.3d 855, 866 (D.C. Cir. 2001) ("*CKRC*")).

For new plants, EPA's floors must reflect the emission level achieved by the single best performing kiln in the category, not the best performing kiln for which EPA happens to have emissions information. EPA does not even claim to know that its new source floors reflect the PM emission level achieved by the best performing kiln in the category, nor could it plausibly advance such a claim without information for more kilns than it has.

Moreover, even if it could be assumed that EPA has identified the single best controlled kiln, the agency has not set the new source floor at the emission level this source achieved in practice but rather the 99 percent UPL for this kiln. Although it may be permissible to set new unit floors "at a level that reasonably estimates the performance of the 'best controlled similar unit' under the worst reasonably foreseeable circumstances,'" *CKRC*, 255 F.3d at 863 (quoting *Sierra Club v. EPA*, 167 F.3d 658, 665 (D.C. Cir. 1999)) (set of internal quotation marks omitted), the UPL is not an estimate of what the single best unit actually "achieved in practice" under any circumstances. By definition, it is a "prediction" of the level EPA expects all future tests by that unit to fall below. And that is not what the Act requires of floors. 42 U.S.C. § 7412(d)(3); *Sierra Club v. EPA*, 479 F.3d 875, 880 (D.C. Cir. 2007).

Further, EPA's decision not to go beyond the floor is unlawful. Clean Air Act § 112 requires the "maximum" degree of reduction in emissions that is "achievable" considering cost. 42 U.S.C. § 7412(d)(2). Far from giving EPA discretion to base decisions on whether to set an emission standard on its subjective view about whether the cost-per-ton of that standard is appropriate, this language unambiguously requires the "maximum" degree of reduction that can be achieved considering cost and the other statutory factors. EPA's contention that it can reject beyond-the-floor standards merely because it views their cost-effectiveness as inappropriate contravenes Congress's plainly expressed intent. By rejecting beyond-the-floor measures on cost-effectiveness grounds, EPA drains the terms "maximum" and "achievable" of meaning and essentially rewrites § 112(d)(2) to provide a far greater level of discretion than the statutory text confers. Congress directed EPA to set standards requiring the "maximum" degree of reduction that is "achievable," not the degree of reduction EPA considers "cost-effective," and its decision must be respected. *Barnhart v. Sigmon Coal Co.*, 534 U.S. 438, 452-53 (2002) ("[W]hen Congress includes particular language in one section of a statute but omits it in another section of the same Act, it is generally presumed that Congress acts intentionally and purposely in the disparate inclusion or exclusion.") (quotation omitted).

II. UNLESS THE RULE IS STAYED, PETITIONERS WILL SUFFER IRREPARABLE HARM.

The pollutants cement plants emit harm the health and welfare of their neighbors. Petitioners have members who live in close proximity to cement plants that currently are allowed to and do emit more of the regulated pollutants than either the 2010 rule or the 2013 Delay Rule allow. These plants will have to install control technology or take other steps to reduce their emissions to comply with either rule. Thus, the two-year delay in the compliance date will cause Petitioners' members to breathe or ingest more of the hazardous pollution cement plants emit than they would in the absence of a stay. Further, the weakened PM standards allow cement plants to emit more PM than they may under the 2010 rule. *See* 78 Fed. Reg. at 10,026/2; *see also id.* at 10,026 tbl.4. All this hazardous pollution is harmful to Petitioners' members' health—the pollutants cause death, heart attacks, and neurological problems, among other effects—and to the environment in which they have an interest. These effects are plainly serious and cannot be undone. *See, e.g.*, *Amoco Production Co. v. Vill. of Gambell, Alaska*, 480 U.S. 531, 545 (1987) ("Environmental injury, by its nature, can seldom be adequately remedied by money damages and is often permanent or at least of long duration, *i.e.*, irreparable.").

Judicial review will extend past the September 9, 2013, compliance date established in the 2010 rule. Even the expedited judicial review of the 2010 rule took over a year from the rule's promulgation. Consequently, if the 2013 Delay Rule's illegal provisions remain in effect pending judicial review, harm will occur that would not if EPA stayed those provisions.

As EPA is aware, the air pollutants cement plants emit are extremely dangerous. PM is known to cause death and cardiovascular harms, like heart attacks, that can require emergency room visits and hospitalization. 78 Fed. Reg. 3086, 3103/2-04/1 (Jan. 15, 2013). It likely causes respiratory harms, and may also cause developmental harms and lung cancer. *Id.* at 3103/3-04/1. It is dangerous for all, but particularly dangerous for children, seniors, and people with pre-existing heart or lung conditions. *Id.* at 3104/1. There is no known threshold below which PM is not dangerous. *E.g.*, *id.* at 3140/1. PM also likely harms vegetation and ecosystems, especially near cement plants. *Id.* at 3203/2.

Moreover, PM is a surrogate for various metals that Congress listed as hazardous air pollutants. *National Lime*, 233 F.3d at 637-40 (upholding EPA's use of PM as surrogate for non-mercury hazardous metals); *see also* 42 U.S.C. § 7412(b)(1), (7) (listing hazardous air pollutants, including arsenic, antimony, beryllium, cadmium, chromium, cobalt, manganese, and nickel and their compounds, and lead compounds). These hazardous substances cause a range of effects that include "skin irritation, mucous membrane irritation (e.g., lung irritation), gastrointestinal effects, nervous system effects (including cognitive effects, tremor, and numbness), increased blood pressure, and reproductive and developmental effects." 63 Fed. Reg. 14,182, 14,184/3 (Mar. 24, 1998). Some, like arsenic and chromium, are also carcinogenic. 68 Fed. Reg. 26,690, 26,692-94 (May 16, 2003).

Many of the hazardous metals cement plants emit—like mercury, cadmium, and lead—are persistent toxins, meaning that they do not break down or become less toxic in the environment. EPA, Deposition of Air Pollutants to the Great Waters, First Report to Congress (1994) ("Great Waters Report"), Executive Summary at ix-x. Instead, they build up in the environment, being absorbed by plants and bioaccumulating in animals. *Id.* Once people ingest these plants and animals, the toxins build up in people, too. *See id.* That is, once they come out of a kiln's smokestack, they are going to remain in the environment, damaging it and human health.

Mercury is particularly hazardous. Children's exposure *in utero* can cause neuro-developmental harms, and exposure outside the womb also harms brain development. Comments of NRDC *et al.* 2-4 (EPA-HQ-OAR-2002-0051-2898, Sept. 4, 2009). Mercury can also harm adults neurologically, and has been linked to cardiovascular problems. *Id.* at 4-5. It pervades the watershed, accumulating in fish and other wildlife, and ultimately in humans. *Id.* at 8. Nearly every state—48 of the 50—have posted health advisories for mercury in fish from 35% of total U.S. lake acreage and about 25% of U.S. river miles. *Id.* at 8-9.

THC is a surrogate for non-dioxin organic hazardous air pollutants. *National Lime*, 233 F.3d at 633. Among those that cement plants emit are acetaldehyde, benzene, formaldehyde, naphthalene, and polycyclic organic matter ("POM"). 63 Fed. Reg. at 14,184/3. These pollutants cause cancer, as well as neurological, blood, gastrointestinal, developmental, and liver harms. *Id.* at 14,184/3-85/1. A persistent bioaccumulative toxic, 42 U.S.C. § 7412(c)(6), POM consists of a range of chemical compounds, including polycyclic aromatic hydrocarbons ("PAH") such as naphthalene. 76 Fed. Reg. 57,106, 57,308/3 (Sept. 15, 2011). PAH and naphthalene are at least probable human carcinogens. *Id.* at 57,308/3-09/1. POM can also cause skin problems and may affect reproduction and child development. *Id.* at 57,308/3; EPA, Polycyclic Organic Matter (POM), last updated Nov. 6, 2007, http://www.epa.gov/ttn/atw/hlthef/polycycl.html.

Chronic exposure to HCl "can cause damage to eyes, nose, throat, and the upper respiratory tract as well as pulmonary edema, bronchitis, gastritis, and dermatitis." 75 Fed. Reg. at 54,985/3. It can lead to asthma. 78 Fed. Reg. at 10,028/3.

III. The Public Interest Strongly Favors a Stay, and Other Parties Will Not Be Harmed by a Stay.

EPA estimates that the standards will prevent 960-2,500 people from dying per year. EPA, *RIA* at 6-15 tbl.6-3. Thus, during the two years of the delay, 1,920-5,000 preventable deaths will occur. And, during that time, by EPA's own accounting there will also needlessly be 17,000 cases of aggravated asthma, 1,500 heart attacks, and 130,000 days when people have to miss work because of illness associated with just some of the pollution from cement plants. *Id.* Moreover, these standards are already nearly 13 years overdue. During that time, EPA has been violating the law, and people have been suffering—between 12,480 and 32,500 unnecessary deaths, 19,500 unnecessary nonfatal heart attacks, 221,000 unnecessary cases of aggravated asthma, and 1,690,000 unnecessary missed days of work—contrary to the public interest. The public interest thus strongly favors staying the 2013 Delay Rule.

As the agency responsible for the proper execution of the Clean Air Act, EPA cannot be substantially harmed by a stay that would prevent it from giving effect to portions of a rule that contradicts the letter and spirit of the Act. Nor will cement companies suffer cognizable harm from a stay—and certainly not the irreparable harm necessary to counter Petitioners' irreparable injuries absent a stay. Compliance with the law cannot be a cognizable harm.

Moreover, any harms to cement companies are self-imposed, for the companies have known since 2010 that new, tougher standards would go into effect in 2013. In 2011, the Court upheld most of EPA's methodology for setting those standards, and expressly decided to leave them in effect. *Portland Cement*, 665 F.3d at 189. The Court even noted that "it is unlikely that significant changes will be made to the standards upon reconsideration." *Id.* Yet, rather than comply with the standards, the companies bet that they could get the compliance deadline extended. They are in no position to complain if they lose their bet.[2] *See, e.g.*, *Cuomo v. NRC*, 772 F.2d 972, 977 (D.C. Cir. 1985) (rejecting party's claims of harms from stay when harms stem from "self-imposed risk" and "self-imposed costs").

Further, it is "well settled that economic loss does not, in and of itself, constitute irreparable harm." *Wisc. Gas Co. v. FERC*, 758 F.2d 669, 674 (D.C. Cir. 1985); *accord Davis*, 571 F.3d at 1295 ("we see no reason to depart from the general rule that economic harm does not constitute irreparable injury."). The U.S. cement industry is dominated by a few multinational corporations. EPA, *RIA* at 2-18 to -20 & tbl.2-11. In determining economic harm, the entity to look at is the overall parent company, not a individual plant or kiln. *See, e.g.*, *Holiday CVS v.*

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[2] That is especially the case here because the Act provides for extensions for sources that truly need additional time to come into compliance. 42 U.S.C. § 7412(i)(3)(B).

Holder, 839 F. Supp. 2d 145, 168-169 (D.D.C. 2012) ("courts in this Circuit and elsewhere have found the economic status of a plaintiff's parent corporation to be highly relevant when a plaintiff seeks to show irreparable economic harm."). EPA has further determined that the 2010 rule "will not have a significant economic impact on the four small" cement companies. EPA, *RIA* at 4-3. Thus, any economic harm to cement companies from a stay cannot rise to the magnitude required for it to be truly irreparable. *Wisc. Gas*, 758 F.2d at 674 (harm must be "great" and "[r]ecoverable monetary loss may constitute irreparable harm only where the loss threatens the very existence of the movant's business").

CONCLUSION

As discussed above, each of the four factors strongly favors Petitioners. Consequently, Petitioners request that EPA stay the relevant portions of the 2013 Delay Rule pending judicial review.

If you have any questions, please do not hesitate to call me at (202) 667-4500.

Sincerely,

/s/James S. Pew
James S. Pew
Seth L. Johnson
Counsel for Petitioners

Exhibit C

Comments of
Natural Resources Defense Council • American Association on Intellectual and Developmental Disabilities (aaidd) • American Nurses Association • Association of Reproductive Health Professionals (ARHP) • Learning Disabilities Association of America • Physicians for Social Responsibility • Reproductive Health Technologies Project • San Francisco Baykeeper

September 4, 2009

By Electronic Mail, and Submission to www.regulations.gov

U.S. Environmental Protection Agency
EPA Docket Center (6102T)
National Emission Standards for Hazardous Air Pollutant
From the Portland Cement Manufacturing Industry Docket
Docket ID No. EPA-HQ-OAR-2002-0051
1200 Pennsylvania Ave., NW
Washington, DC 20460
Fax: (202) 566-9744
E-mail: a-and-r-Docket@epa.gov

Re: **Comments on May 2009 Proposed Rule on National Emission Standards for Hazardous Air Pollutants from the Portland Cement Manufacturing Industry (EPA-HQ-OAR-2002-0051)**

We submit these comments on behalf of the Natural Resources Defense Council (NRDC) and American Association on Intellectual and Developmental Disabilities (aaidd), Association of Reproductive Health Professionals (ARHP), Learning Disabilities Association of America (LDAA), Physicians for Social Responsibility (PSR), Reproductive Health Technologies Project (RHTP), and San Francisco Baykeeper. More than 9,500 NRDC members and activists have already written to EPA about this proposed rule, and we join them in urging EPA to move quickly to adopt the Proposed Rule, largely as proposed, and to reject the discussed alternatives. We also encourage EPA to make some improvements to the rule, in particular to require continuous emissions monitoring for particulate matter (non-volatile metal hazardous air pollutant) emissions and to regulate all sources of hexavalent chromium at cement plants.

The Proposed Rule proposes standards to control a number of hazardous air pollutants ("HAPs") that adversely affect public health and are required to be controlled pursuant to the Clean Air Act ("Clean Air Act" or "Act"). The proposed standards meet the requirements of the Act, would go a long way towards improving public health protections, and are long overdue. Therefore, we urge EPA to move expeditiously to approve the Proposed Rule, with a few small improvements, including those for continuous emissions monitoring for particulate matter emissions and controls on all hexavalent chromium emissions from cement plants.

I. EPA Should Adopt the Proposed Mercury Emissions MACT Floor Standards for Portland Cement Facilities.

A. Cement Plants Are a Major Emitter of Mercury, Which Adversely Affects Public Health.

Mercury emissions from cement plants

Cement plants are the fourth largest emitter of airborne mercury in the US.[1] In regions where there is little coal fired power generation, such as California, the contribution of cement plants to airborne anthropogenic mercury emissions is greater, 75-90%.[2] According to the Toxic Release Inventory (TRI), US cement plants emitted 11,177 pounds of mercury in 2007.[3] The level of mercury emissions varies between individual cement plants ranging up to over 2,000 pounds per year in the 2007 TRI.[4] EPA's calculation of annual emission factors, based on mercury input data for 89 kilns, also varied significantly between kilns from under 10 (7.54) pounds per million tons of raw material feed to nearly 2,000 (1,982.10).[5] Mercury emissions from cement plants include all three forms of mercury; elemental, particulate, and reactive. The relative contribution of each form is known to vary between plants and operational parameters.[6] [7]

Mercury causes neurodevelopmental toxicity in children

Methyl mercury readily crosses the placenta and the blood brain barrier and is known to be neurotoxic, especially to the developing brain.[8] EPA completed its reference dose (RfD) for chronic exposure to methyl mercury in 2001.[9] The Agency based the assessment on developmental neuropsychological impairment to derive a RfD of 0.0001 mg/kg-day based on human epidemiological data from the cohort study in the Faroe Islands. Studies of the cohort of 1,022 children born in the Faroe Islands in 1986-87 have consistently showed associations between intrauterine methylmercury and impaired neurobehavioral performance.[10] The most recent assessment of this cohort, at age 14

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[1] US EPA, EPA Proposes to Slash Mercury Emissions from Cement Plants, http://yosemite.epa.gov/opa/admpress.nsf/6427a6b7538955c585257359003f0230/b91c90635d61e6e58525759f0075ab57!OpenDocument (April 21, 2009) (Attached).

[2] US EPA 2009. Toxic Release Inventory Facility Report for 2006 & 2007. http://www.epa.gov/triexplorer/. (Attached).

[3] US EPA 2009. Toxic Release Inventory Chemical Report for 2007. http://www.epa.gov/triexplorer/. (Attached).

[4] US EPA 2009. Toxic Release Inventory Facility Report for 2007. http://www.epa.gov/triexplorer/. (Attached).

[5] US EPA. 2008. Mercury Database and Emissions Data for HCl, THC and PM. Docket # EPA-HQ-OAR-2002-0051.2091.

[6] 74 Fed. Reg. at 21142.

[7] 2008 Mercury Speciation Study Tehachapi (Monolith) Facility August 25, 2008 (Attached).

[8] Myers GJ, Davidson PW. Prenatal mercury exposure and children: Neurologic, developmental, and behavioral research. Environ. Health Perspect. 106(Suppl 3): 841-847, 1998. (Attached).

[9] US EPA. Risk Assessment for Methylmercury, in the Water Quality Criterion for the Protection of Human Health: Methylmercury, Final, January 2001. http://www.epa.gov/iris/subst/0073.htm. (Attached).

[10] Grandjean P, White RF, Weihe P, Jorgensen PJ. Neurotoxic risk caused by stable and variable exposure to methylmercury from seafood. Ambul. Pediatr. 3(1):18-23, 2003. (Attached).

years, found that prenatal methylmercury exposure was significantly associated with deficits in finger tapping speed, reaction time, and cued naming – indicating deficits in motor function, attention, and verbal performance.[11] The analysis indicated that neurological deficits had not changed in these children since the last assessment at age seven years, providing support to EPA's chronic oral RfD.

Since EPA's 2001 methyl mercury risk assessment, numerous studies have been published showing neurological effects in children from early life exposures to mercury. Effects have been reported at doses lower than those shown to have effects in the Faroe study. A Massachusetts cohort study of 341 mother-child pairs with low-moderate fish consumption (12% of mothers consumed fish >2 times per week) and relatively low blood mercury levels found that child cognitive test performance improved with increased fish intake but declined with increasing mercury intake. Specifically, at age six months, tests of visual recognition memory (VRM) showed that each increase of 1 ppm in maternal hair mercury at delivery was associated with a decrement in VRM score of 7.5 (-13.7 to -1.2) points.[12] At age three years, children whose mothers' mercury level was in the top decile (i.e. erythrocyte Hg levels above 9.1 ng/g) had significant decrements in performance in standard neurodevelopmental tests of visual motor development and receptive vocabulary.[13] These findings support the growing scientific consensus that fish is beneficial for infant neurodevelopment, while mercury is clearly adverse.[14] [15]

A recent study from the Seychelles cohort focused on 779 children for whom postnatal mercury exposure data were available. This study identified associations between postnatal mercury exposure and several outcomes at age nine years, including an ADHD index test in both sexes, and several tests of motor function as well as IQ in girls.[16] Although the results in this study were not fully internally-consistent, they suggest a need for concern about postnatal mercury exposure in children, in addition to the known concerns about prenatal exposure.

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[11] Debes F, Budtz-Jørgensen E, Weihe P, White RF, Grandjean P. Impact of prenatal methylmercury exposure on neurobehavioral function at age 14 years. Neurotoxicol. Teratol. 28(5):536-47, 2006. (Attached).

[12] Oken E, Wright RO, Kleinman KP, Bellinger D, Amarasiriwardena CJ, Hu H, Rich-Edwards JW, Gillman MW. Maternal fish consumption, hair mercury, and infant cognition in a U.S. Cohort. Environ. Health Perspect. 113(10):1376-80, 2005. (Attached).

[13] Oken E, Radesky JS, Wright RO, Bellinger DC, Amarasiriwardena CJ, Kleinman KP, Hu H, Gillman MW. Maternal fish intake during pregnancy, blood mercury levels, and child cognition at age 3 years in a US cohort. Am. J. Epidemiol.167(10):1171-81, 2008. (Attached).

[14] Davidson PW, Myers GJ, Weiss B. Mercury exposure and child development outcomes. Pediatrics. 113(4 Suppl):1023-9, 2004. (Attached).

[15] Oken E, Bellinger DC. Fish consumption, methylmercury and child neurodevelopment. Curr. Opin. Pediatr. 20(2):178-83, 2008. (Attached).

[16] Myers GJ, Thurston SW, Pearson AT, Davidson PW, Cox C, Shamlaye CF, Cernichiari E, Clarkson TW. Postnatal exposure to methyl mercury from fish consumption: a review and new data from the Seychelles Child Development Study. Neurotoxicol. 30(3):338-49, 2009. (Attached).

Recent animal research suggests significant concern for delayed neurotoxicity from mercury. Two strains of mice were exposed to methyl mercury during gestation and the early prenatal period. Brain mercury levels peaked at an early age and dropped fairly quickly such that they were indistinguishable from controls by 13 weeks of age. In contrast, minimal or no neurobehavioral deficits were found at testing at 12 weeks, and did not become apparent until age 52 weeks (i.e. in middle age in the mice).[17] The researchers concluded that there may be an initial (or triggering) toxicologic event that occurs before the brain mercury concentration stabilizes, and that the nature of the event may represent an acceleration of the aging process.

Mercury is also toxic to adults at low doses

Recent research has revealed that hair mercury concentrations only slightly above the levels found in the U.S. population are associated with neurological deficits in adults. A cross-sectional study of 129 adults in Brazil found detectable alterations in performance on tests of fine motor speed and dexterity, and on tests of concentration, verbal learning, and memory.[18] The effects were dose-dependent.

Cardiovascular effects have also been reported in adults at environmentally-relevant exposure levels. A case-control study, conducted in eight European countries and Israel, evaluated the association of mercury levels in toenail clippings and docosahexaenoic acid (DHA) levels in adipose tissue with the risk of a first myocardial infarction among men. The study included 684 men with a first diagnosis of myocardial infarction and 724 controls. After adjustment for the DHA level and coronary risk factors, the mercury levels in the patients were 15 percent higher than those in controls. The risk-factor-adjusted odds ratio for myocardial infarction associated with the highest as compared with the lowest quintile of mercury was 2.16 (95 percent confidence interval, 1.09 to 4.29; P for trend=0.006). The toenail mercury level was directly associated with the risk of myocardial infarction.[19]

Although previous studies have suggested an association between high fish intake and reduced coronary heart disease (CHD) mortality, men in Eastern Finland, who have a high fish intake, have an exceptionally high CHD mortality. This paradox could in part be explained by high mercury content in fish. 1,833 men aged 42 to 60 years who were free of clinical CHD, stroke, claudication, and cancer were recruited into a cohort for study.[20] Of these, 73 experienced an acute myocardial infarction (AMI) in 2 to 7 years. Men who

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[17] Yoshida M, Shimizu N, Suzuki M, Watanabe C, Satoh M, Mori K, Yasutake A. Emergence of delayed methylmercury toxicity after perinatal exposure in metallothionein-null and wild-type C57BL mice. Environ. Health Perspect. 116(6):746-51, 2008. (Attached).

[18] Yokoo EM, Valente JG, Grattan L, Schmidt SL, Platt I, Silbergeld EK. Low level methylmercury exposure affects neuropsychological function in adults. Environ. Health. 2(1):8, 2003. (Attached).

[19] Guallar E, Sanz-Gallardo MI, van't Veer P, Bode P, Aro A, Gomez-Aracena J, et al. Mercury, fish oils, and the risk of myocardial infarction. N. Engl. J. Med. 347(22):1747-54, 2002. (Attached).

[20] Salonen JT, Seppanen K, Nyyssonen K, Korpela H, Kauhanen J, Kantola M, et al. Intake of mercury from fish, lipid peroxidation, and the risk of myocardial infarction and coronary, cardiovascular, and any death in eastern Finnish men. Circulation 91(3):645-55, 1995. (Attached).

had consumed local nonfatty fish species had elevated hair mercury. Dietary intakes of fish and mercury were associated with significantly increased risk of AMI and death from CHD, CVD, and any death. Men in the highest tertile (> or = 2.0 micrograms/g) of hair mercury content had a 2.0-fold (95% confidence interval, 1.2 to 3.1) age- and CHD-adjusted risk of AMI and a 2.9-fold (95% CI, 1.2 to 6.6) adjusted risk of cardiovascular death compared with those with a lower hair mercury content. In a nested case-control subsample, the 24-hour urinary mercury excretion had a significant independent association with the risk of AMI. Both the hair and urinary mercury associated significantly with titers of immune complexes containing oxidized LDL. The authors concluded that these data suggest that a high intake of mercury is associated with an excess risk of AMI as well as death from CHD, CVD, and any cause in Eastern Finnish men and this increased risk may be due to the promotion of lipid peroxidation by mercury.

A more recent study in the Faroe Islands focused on 42 Faroese men and evaluated mercury exposure from toenail clippings and hair samples. Mercury levels were significantly associated with increased blood pressure, and with intima-media thickness of the carotid artery (a measurement of atherosclerosis).[21] Although this study is relatively small, it supports the previous investigations reported above, which demonstrate adverse effects of mercury on the cardiovascular system. This finding is supported by data showing that higher levels of mercury in the blood of exposed humans is negatively associated with tissue inhibitors of metalloproteases, indicating that metalloprotease-associated oxidative stress might be at least one potential mechanism for mercury toxicity, especially since these proteases have been associated with cardiovascular risk.[22]

Mercury emissions from cement facilities endanger communities adjacent to the facilities

The impacts of these emissions on neighboring communities have been documented in two recent studies conducted in Davenport and Cupertino. Taken together these two studies illustrate the significant public health threat posed by uncontrolled mercury emissions in California.

The town of Davenport is located about 10 miles north of Santa Cruz along the Pacific coast of California and adjacent to the southeast side of the RMC Pacific Materials dba CEMEX cement plant. The plant was constructed in 1905 and began operating in 1906. The plant is permitted to operate 24 hours a day, 7 days a week, 48

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[21] Choi AL, Weihe P, Budtz-Jørgensen E, Jørgensen PJ, Salonen JT, Tuomainen TP, Murata K, Nielsen HP, Petersen MS, Askham J, Grandjean P. Methylmercury exposure and adverse cardiovascular effects in Faroese whaling men. Environ. Health Perspect. 117(3):367-72, 2009. (Attached).

[22] Jacob-Ferreira AL, Passos CJ, Jordão AA, Fillion M, Mergler D, Lemire M, Gerlach RF, Barbosa Jr F, Tanus-Santos JE. Mercury Exposure Increases Circulating Net Matrix Metalloproteinase (MMP)-2 and MMP-9 Activities. Basic Clin. Pharmacol. Toxicol. 1-8, 2009 [Epub ahead of print] PMID: 19594729. (Attached).

weeks per year. In 2004, it produced 888,865 tons of cement.[23] According to the 2007 TRI, the CEMEX plant reported 163 pounds of mercury emissions. In the town and 0.2 miles southeast of the cement plant, is Pacific Elementary school which serves as the only elementary schools for the district. In October and November of 2007 and again from May 12 through August 5, 2008 the elemental mercury levels were monitored as part of a collaborative research project between the Monterey Bay Unified Air Pollution Control District and the US EPA Region 9 office.[24] [25] An automated Tekran Model 2537A Mercury Vapor Analyzer was deployed at a site adjacent to the elementary school building to record continuous levels of airborne mercury.[26] The 2008 sampling data was reviewed and quality assurance was conducted by the US EPA prior being provided to interested stakeholders.[27] Mercury levels were reported at five minute intervals.

During the first month of monitoring the cement plant was not operational providing a chance to evaluate background concentrations of mercury.[28] During this time the average daily concentration measured at the sampling site was 1.70 ng/m^3 with a 95% confidence interval of 1.62-1.78[29]. The minimum and maximum level measured for any five minute interval during this period was 0.89 and 5.43 ng/m^3 respectively. Resumption of cement plant operations coincided with a pattern of intermittent spikes in mercury levels measured at the school. Overall, the daily average mercury level measured while the plant was operational increased to 4.47 ng/m^3 with a 95% confidence interval of 3.59-5.35. The minimum and maximum level measured for any five minute interval during the period where the plant was operational was 0.77 and 199.94 ng/m^3 respectively. The duration of time during which mercury levels were elevated over background levels varied significantly across the monitoring period. On a daily basis, mercury levels above the maximum level measured while the plant was not operating were measured for an average of 3.28 hours per day with a minimum and maximum of 0.00 to 11.92 hours per day. Over the monitoring period, on 86% of the days were the plant was operational at least one five minute measurement recorded mercury levels above the maximum level measured while the plant was not operational.

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[23] Sierra Research, Inc. 2007. California Air Toxics "Hot Spots" Program AB2588 Health Risk Assessment for RMC Pacific Materials dba CEMEX, Davenport CA. Prepared for CEMEX. October 2007. (Attached).

[24] Craft, David. 2008. Memo Subject: Addendum prepared by the MBUAPCD to the October 2007 Health Risk Assessment prepared be CEMEX. Dated May 16, 2008. (Attached).

[25] Ed Kendig. 2008. Email correspondence between Ed Kendig, compliance division manager for the Monterey Bay Unified Air Pollution Control District and stakeholders Subject: Early Commencement of EPA Monitoring 5/12/08. (Attached).

[26] Ed Kendig 2007. Email correspondence from Ed Kendig compliance division manager for the Monterey Bay Unified Air Pollution Control District. Dated October 10, 2007. (Attached).

[27] Ed Kendig. 2008. Email correspondence between Ed Kendig, compliance division manager for the Monterey Bay Unified Air Pollution Control District and stakeholders Subject: Davenport 2008 data. (Attached).

[28] In addition to monitoring data, the MBUAPCD also provided data on daily operational patterns of the facility. See email from David Frisbey dated September 10, 2008. Subject: Oct 14 Questions from Townspeople regarding Air Quality. (Attached).

[29] Analyses conducted by NRDC based on data and information provided by the MBPUAPCD

During the monitoring period the level of mercury measured at the monitoring site repeatedly exceeded the California chronic non-cancer reference exposure level (REL) of 30 ng/m^3 for inhalation of inorganic mercury to protect the developing brain from neurological impairment.[30]

According to officials from the Monterey Bay Unified Air Pollution Control District (MBUAPCD), there are no other significant sources of mercury emissions in the vicinity of the monitoring site. MBUAPCD officials have attributed the intermittent pattern of mercury emissions recorded during the monitoring period to wind patterns which direct the stack emissions from the cement plant over the town.[31]

This city of Cupertino is located in Northern California at the southern tip of the San Francisco Bay. The Lehigh-Permanente Cement Plant (Heidelberg Cement Group) is located west of the city in the upper watershed of Permanente Creek which flows through the facility and ultimately discharges to the San Francisco Bay. The facility is permitted for a maximum annual production of 1.6 million tons of clinker and reported 236 pounds of mercury emissions to the 2007 TRI. In the fall of 2007 and winter of 2008 the San Francisco Estuary Institute (SFEI) conducted a study of atmospheric mercury deposition in the vicinity of the Lehigh-Permanente cement plant.[32]

The SFEI study found significantly higher levels of all three forms of mercury, elemental, reactive gaseous mercury, and particulate, at the monitoring site downwind of the cement plant as compared to two control sites. Average levels were reported as approximately 20% higher for elemental mercury and 6-10 times higher for RGM and particulate. Similarly calculations of RGM and particulate mercury flux were found to be 3 and 4 times higher at the cement plant monitoring site than the control sites.[33] Although the mercury levels reported in this study were significantly lower than those measured during the Davenport study, the impacts of elevated levels of wet and dry deposition has not been assessed for nearby waterways. Health warnings for mercury in fish have been issued for both the San Francisco Bay and the nearby Stevens Reservoir.[34,35]

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[30] CalEPA, OEHHA.2007 Technical Support Document For the Derivation of Noncancer Reference Exposure Levels. (Attached).

[31] Ed Kendig 2008. Email to stakeholders Subject: October 14 Questions from Townspeople regarding Air Quality. Dated August 22, 2008.

[32] The final results of this investigation is pending publication. The results presented here were taken from a presentation of preliminary findings made at 2008 Mercury Coordination Meeting on February 20, 2008.

[33] Rothenberg et al. 2008. An Investigation of Atmospheric Mercury Deposition to Bay Area Storm Runoff: a Pilot Study. Presentation made at 2008 Mercury Coordination Meeting on February 20, 2008, available at http://www.sfei.org/rmp/mercurymeeting/2008/index.html. (Attached).

[34] California OEHHA. Stevens Reservoir Mercury Advisory. (Attached).

[35] California OEHHA. San Francisco Bay and Delta Region Fish Advisory http://www.oehha.ca.gov/fish/general/sfbaydelta.html. (Attached).

Mercury emissions from cement facilities also endanger people who live at a distance from the facilities

Mercury exposure as a result of cement kiln emissions can occur not only through direct inhalation of elemental mercury in the air, but also through ingestion of methylmercury contaminated fish.

Mercury is emitted into the atmosphere in three forms, elemental mercury (Hg^0), reactive gaseous mercury (RGM) and particulate mercury (PH_g), each with different residence times in the atmosphere.[36] Wet and dry deposition of atmospheric mercury enriches soils, sediment, and streams both in geographic proximity to sources and at great distances.[37] [38] Biological processes in the watershed convert the mercury to methylmercury which accumulates in the food chain resulting in elevated levels in fish, other wildlife, and humans.[39] Increased levels of methylmercury at the base of the food chain have been identified as the main predictor of bioaccumulation in fish.[40] Although watershed characteristics play a significant role in methylation rates, mercury levels in fish have been correlated with level of atmospheric deposition.[41] [42] [43] [44] [45] Because mercury levels are biomagnified as they move through the food chain, modest levels of mercury inputs through atmospheric deposition in areas with a large ecosystem capacity to methylate mercury can result in high levels of methylmercury in fish.[46]

Mercury contamination of fish stocks is widespread in the United States, with nearly every state (48 out of 50) publishing health advisories for mercury in fish.[47] These impacted waterways represent 14,177,175 lake acres and 882,963 river miles, or 35

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[36] Driscoll CT, Han Y, Chen CY, Evers DC, Lambert KF, Holsen TM, et al. Mercury contamination in forest and freshwater ecosystems in the northeastern United States. Biosci. 57(1):17-28, 2007. (Attached).

[37] Evers DC, Han Y, Driscoll CT, Kamman NC, Goodale MW, Lambert KT, et al. Biological mercury hotspots in the northeastern United States and southwestern Canada. Biosci. 57(1):29-43, 2007. (Attached).

[38] Parsons MJ, Long DT, Yohn SS, Giesy JP. Spatial and temporal trends of mercury loadings to Michigan Inland Lakes. Environ. Sci. Technol. 41(16):5634-40, 2007. (Attached)..

[39] US EPA 2009. Human Exposure to Methylmercury. http://www.epa.gov/mercury/exposure.htm. (Attached).

[40] Chasar LC, Scudder BC, Stewart AR, Bell AH, Aiken GR. Mercury cycling in stream ecosystems. 3. Trophic dynamics and methylmercury bioaccumulation. Environ. Sci. Technol. 43(8):2733-39, 2009. (Attached).

[41] Peterson SA, Van Sickle J, Herlihy AT, Hughes RM. Mercury concentration in fish from streams and rivers throughout the western United States. Environ. Sci. Technol. 41(1):58-65, 2007. (Attached).

[42] Hammerschmidt CR, Fitzgerald WF. Methylmercury in freshwater fish linked to atmospheric mercury deposition. Environ. Sci. Technol. 40(24):7764-70, 2006. (Attached).

[43] Driscoll CT, Han Y, Chen CY, Evers DC, Lambert KF, Holsen TM, et al. Mercury contamination in forest and freshwater ecosystems in the northeastern United States. Biosci. 57(1):17-28, 2007. (Attached).

[44] Evers DC, Han Y, Driscoll CT, Kamman NC, Goodale MW, Lambert KT, et al. Biological mercury hotspots in the northeastern United States and southwestern Canada. Biosci. 57(1):29-43, 2007. (Attached).

[45] USGS. 2009. Mercury in Fish, Bed Sediment, and Water from Streams Across the United States, 1998-2005. (Attached).

[46] Ibid., 49.

[47] USGS. 2009. Recent findings from the National Water-Quality Assessment (NAWQA) and Toxic Substances Hydrology Programs (as presented to the NAWQA National Liaison Committee, August 21, 2009). (Attached).

percent of the US total lake acreage and about 25 percent of river miles. Coastal waterways have also been listed, including all of the Gulf Coast.[48] A recent study of mercury levels in fish in streams across the United States found methylmercury levels exceeding the level for human health concern at nearly 30% of the sites sampled.[49]

In addition, cement plant mercury emissions enter the global mercury cycle that contributes to elevated levels of methylmercury in commercial fish stocks. According to a National Academy of Sciences report, high-end fish consumers could be at risk for unsafe levels of mercury exposure.[50] In 2004, the Environmental Protection Agency and the US Food and Drug Administration issued a joint advisory which warned women who might become pregnant, are pregnant, nursing mothers, or young children to avoid eating four types of commercial available fish, Shark, Swordfish, King Mackerel, or Tilefish, because of unsafe levels of methylmercury.[51]

Newly deposited mercury has been shown to be more bioavailable and more rapidly converted to methylmercury and represents a greater fraction of the methylmercury which is incorporated into food chains and ultimately fish.[52] [53] Local sources have been implicated in elevated levels of mercury measured in ambient air[54], precipitation[55] [56] soils[57] and methyl mercury levels in biota including fish.[58] Reductions in local mercury emissions levels have been tied to decreasing levels measured in the

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[48] US EPA 2007. National Listing of Fish Advisories Technical Fact Sheet: 2005/06 National Listing Fact Sheet; EPA-823-F-07-003; July 2007. (Attached).

[49] USGS. 2009. Mercury in Fish, Bed Sediment, and Water from Streams Across the United States, 1998-2005. (Attached).

[50] National Research Council. 2000, Toxicological Effects of Methylmercury. National Academy Press. Washington DC.

[51] US Department of Health and Human Services and Environmental Protection Agency. 2009. What You Need to Know About Mercury in Fish and Shellfish. Available at http://www.fda.gov/Food/FoodSafety/Product-SpecificInformation/Seafood/FoodbornePathogensContaminants/Methylmercury/ucm115662.htm. (Attached).

[52] USGS. 2009. Mercury in Fish, Bed Sediment, and Water from Streams Across the United States, 1998-2005. (Attached).

[53] Hintelmann H, Harris R, Heyes A, Hurley JP, Kelly CA, Krabbenhoft DP, et al. Reactivity and mobility of ne and old mercury deposition in a boreal forest ecosystem during the first year of the METAALICUS study. Environ. Sci. Technol. 36(23):5034-40, 2002. (Attached).

[54] Manolopoulos H, Snyder DC, Schauer JJ, Hill JS, Turner JT, Olson ML, et al. Sources of speciated atmospheric mercury at a residential neighborhood impacted by industrial sources. Environ. Sci. Technol. 41(16):5626-33, 2007. (Attached).

[55] Dvonch JT, Graney JR, Keeler GJ, Stevens RK. Use of elemental tracers to source apportion mercury in south Florida precipitation. Environ. Sci. Technol. 33(24):4522-27, 1999. (Attached).

[56] White EM, Keeler GJ, Landis MS. Spatial variability of mercury wet deposition in eastern Ohio: summertime meteorological case study analysis of local source influences. Environ. Sci. Technol. 43(13):4946-53, 2009. (Attached).

[57] Biester H, Müller G, Schöler HF. Estimating distribution and retention of mercury in three different soils contaminated by emissions from chlor-alkali plants: part I. Sci. of the Tot. Environ. 284:177-89, 2002. (Attached).

[58] Evers DC, Han Y, Driscoll CT, Kamman NC, Goodale MW, Lambert KT, et al. Biological mercury hotspots in the northeastern United States and southwestern Canada. Biosci. 57(1):29-43, 2007. (Attached).

environment and biota.[59] [60] [61] Therefore, in order to achieve the National Academy of Sciences public health goal to reduce mercury concentration in fish[62], current mercury emissions must be ratcheted down to decrease the amount of mercury cycling through aquatic systems and reduce contamination of fish and people.

Mercury exposure in the U.S. population

A significant fraction of the U.S. population has elevated levels of mercury. Reports from the 1999-2000 National Health and Nutrition Examination Survey (NHANES) found that blood mercury levels were approximately 3-fold higher in women compared with children. Geometric mean mercury levels were almost 4-fold higher among women who ate 3 or more servings of fish in the past 30 days compared with women who ate no fish in that period. Approximately 8% of women had concentrations of mercury in their blood higher than 5.8 µg/L, which is directly equivalent to the EPA's recommended reference dose.[63] An assessment of the NHANES data concluded that more than 300,000 newborns each year in the U.S. may have been exposed in utero to methyl mercury concentrations higher than those considered to be without increased risk of neurodevelopmental effects.[64]

An analysis of the Asian, Pacific Islander, and Native American group within the NHANES data revealed that this subgroup is much more highly exposed to mercury. An estimated 16.59 percent of adult female participants in this category had blood mercury levels over 5.8 µg/L, and 27.26 had blood mercury levels over 3.5 µg/L, which incorporates adjustment of the EPA reference dose to account for the fact that mercury becomes more concentrated in umbilical cord blood.[65]

More recent NHANES results have shown that women living in coastal areas of the United States (approximately one in six women) are more likely to have elevated blood mercury levels. Women in the Northeastern U.S, Asian women, and women with higher income ate more fish and had higher mercury levels. From 1999 through 2004,

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[59] Frederick PC, Hylton B, Heath JA, Spalding MA. A historical records of mercury contamination in southern Florida (USA) as inferred from avian feather tissue. Environ. Toxicol. and Chem. 23(6):1474-78, 2004. (Attached).

[60] Driscoll CT, Han Y, Chen CY, Evers DC, Lambert KF, Holsen TM, et al. Mercury contamination in forest and freshwater ecosystems in the northeastern United States. Biosci. 57(1):17-28, 2007. (Attached).

[61] USGS. 2009. Mercury in Fish, Bed Sediment, and Water from Streams Across the United States, 1998-2005. (Attached).

[62] National Research Council. 2000, Toxicological Effects of Methylmercury. National Academy Press. Washington DC.

[63] Schober SE, Sinks TH, Jones RL, Bolger PM, McDowell M, Osterloh J, et al. Blood mercury levels in US children and women of childbearing age, 1999-2000. JAMA. 289(13):1667-74, 2003. (Attached).

[64] Mahaffey KR, Clickner RP, Bodurow CC. Blood organic mercury and dietary mercury intake: National Health and Nutrition Examination Survey, 1999 and 2000. Environ. Health Perspect. 112(5):562-70, 2004. (Attached).

[65] Hightower JM, O'Hare A, Hernandez GT. Blood mercury reporting in NHANES: identifying Asian, Pacific Islander, Native American, and multiracial groups. Environ. Health Perspect. 114(2):173-5, 2006. (Attached).

blood mercury levels decreased without a concomitant decrease in fish consumption, suggesting a shift over this time period in fish species in women's diets.[66]

Other studies of upper income subgroups have also shown a high prevalence of elevated blood mercury levels. A California office-based study of 123 patients who underwent blood testing for mercury on the basis of a survey on fish consumption revealed mercury levels ranging up to 89.5 µg/L. The mean for women was 15 µg/L [SD = 15], and for men was 13 µg/L (SD = 5); 89% had levels exceeding the RfD.[67] Subjects consumed 30 different types of fish. Swordfish had the highest correlation with mercury level. The mean level for women in this survey was 10 times that found in the recent NHANES survey.

Researchers have estimated that in the United States methyl mercury toxicity is associated with between 115 and 2,675 excess cases per year of a level of cognitive impairment that would be considered mental retardation.[68] The cost of caring for these children has been estimated between $28 million and $3.3 billion, a cost the researchers point out is accrued annually until mercury emissions are reduced.[69]

B. The Proposed Standard Meets the Requirements of the Clean Air Act.

The Clean Air Act requires that existing sources of hazardous air pollutants be subjected to emission standards that "shall not be less stringent than . . . the average emission limitation achieved by the best performing 12 percent of the existing sources" for which EPA has data. 42 U.S.C. § 7412(d)(3). Similarly, new sources must be subjected to emission standards that "shall not be less stringent than the emission control that is achieved in practice by the best controlled similar source" for which EPA has data. *Id.* EPA's proposal to set the minimum standard, known as the maximum available control technology ("MACT") floor, for mercury for existing sources at the average emissions level of the lowest emitting 12 percent of the kilns for which it has data is consistent with the statutory directive. 74 Fed. Reg. 21143, 21149; *see Cement Kiln Recycling Coalition v. EPA*, 255 F.3d 855, 861, 865 (D.C. Cir. 2001) (stating that "Section 7412(d)(3) requires only that EPA set floors at *the emission level* achieved by the best-performing sources" and that the statute requires that MACT floors reflect "what the best performers actually achieve") (emphasis added); *Sierra Club v. EPA*, 479 F.3d 875, 880 (D.C. Cir. 2007) (relying on *Cement Kiln's* "holding that section 7412(d)(3)

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[66] Mahaffey KR, Clickner RP, Jeffries RA. Adult women's blood mercury concentrations vary regionally in the United States: association with patterns of fish consumption (NHANES 1999-2004). Environ. Health Perspect. 117(1):47-53, 2009. (Attached).

[67] Hightower JM, Moore D. Mercury levels in high-end consumers of fish. Environ Health Perspect. 111(4):604-8, 2003. (Attached).

[68] Trasande, Leonardo, Schecter, Clyde, Haynes, Karla A., and Landrigan Phillip. Mental Retardation and Prenatial Methylmercury Toxicity. 2006 Am. J. of Indust. Med. 49:153-158. (Attached).

[69] Trasande, Leonardo, Schecter, Clyde, Haynes, Karla A., and Landrigan Phillip. 2006. Applying Cost Analyses to Drive Policy that Protects Children Mercury as a Case Study. Ann. N.Y. Acad. Sci. 1076:911-923. (Attached).

its sector-based approach, that such fuel-switching is likely to have significant air-quality benefits beyond HAPs, in the form of reductions in PM, greenhouse gases, and metals. The full analysis is required to assess whether other emission reduction practices may be more feasible than the beyond the floor options considered in the Proposed Rule.

D. EPA Should Require Continuous Emission Monitoring for Mercury.

We support EPA's proposal to require continuous emission monitoring systems ("CEMS") for purposes of compliance with the proposed standards. We agree with EPA that the monitoring should be consistent with the method used to set the standard and should also ensure accuracy to ensure that the standards are met to protect public health as intended. 74 Fed. Reg. at 21156. CEMS meets both these objectives. *Id.* Because short term tests do not provide a good indication of long term mercury emissions from cement facilities, the standards were developed on the basis of daily measurements of mercury inputs over an extended period of time. *Id.* To follow the exact process that was used to develop the standard would mean daily measurement and analysis of the mercury content of all inputs to the kiln. *Id.* Not only would the costs be approximately the same as for the CEMS, the accuracy of this alternative is inferior to CEMS. *Id.* Requirement of CEMS will provide the most accurate representation of mercury emissions from cement kilns and therefore ensure that compliance with the standard and ensuing public health protections are being met. *See* 64 Fed. Reg. 52828, 52908 (Sept. 30, 1999) ("A COMS is a better indicator of baghouse performance than a bag leak detection system.") *and* 64 Fed. Reg. at 52929/1 (COMS "monitors cannot provide the same level of compliance assurance as particulate matter CEMS.") (both attached). Thus, CEMS are the better alternative, and we support EPA's proposal to require their use. Furthermore, CEMS technology is already in use by cement facilities in Germany and by utility boilers in the U.S. *Id.* We see no reason for U.S. cement facilities not to implement the same monitoring technology.

Due to the lack of uniformity in mercury emissions from cement kiln stacks, instruments used to measure mercury concentrations must be able to adequately characterize a range of concentrations. Accurate measurements of mercury levels at concentrations close to the standard and also at much lower and higher concentrations must be achieved. Therefore, EPA must set appropriate standards, calibration requirements, and quality assurance procedures to ensure adequate performance of the monitoring instruments.

II. EPA Should Control Emissions of Non-Volatile Metal HAPs from Cement Facilities.

A. Cement Facilities Are Sources of Non-Volatile Metal HAPs, Which Adversely Affect Public Health.

Non-volatile metal HAP emissions from cement plants include: antimony (Sb), cadmium (Cd), lead (Pb), selenium (Se), chromium (Cr), arsenic (As), nickel (Ni), and manganese (Mn).[72] Due to the low volatility of these metals the majority of emissions occur as particles.

Non-volatile metal HAP emissions from cement plants threaten public health through direct inhalation of metal containing particles and soil contamination resulting from aerial deposition of metals. Each of the non-volatile metal HAPs emitted by cement facilities are associated with a range of public health impacts as discussed in previous EPA rulemakings.[73]

Antimony
Chronic occupational exposure to antimony (generally antimony trioxide) is most commonly associated with ‘‘antimony pneumoconiosis,’’ a condition involving fibrosis and scarring of the lung tissues. Studies have shown that antimony accumulates in the lung and is retained for long periods of time. Effects are not limited to the lungs, however, and myocardial effects (effects on the heart muscle) and related effects (e.g., increased blood pressure, altered EKG readings) are among the best characterized human health effects associated with antimony exposure. Reproductive effects (increased incidence of spontaneous abortions and higher rates of premature deliveries) have been observed in female workers exposed in antimony processing facilities. Similar effects on the heart, lungs, and reproductive system have been observed in laboratory animals. The International Agency for Research on Cancer concluded that antimony trioxide is ‘‘possibly carcinogenic to humans’’ (Group 2B).

Arsenic
Arsenic is a known human carcinogen. Chronic (long-term) inhalation exposure to inorganic arsenic in humans is associated with irritation of the skin and mucous membranes. Human data suggest a relationship between inhalation exposure of women working at or living near metal smelters and an increased risk of reproductive effects, such as spontaneous abortions. Inorganic arsenic exposure in humans by the inhalation route has been shown to be strongly associated with lung cancer, while ingestion or inorganic arsenic in humans has been linked to a form of skin cancer and also to bladder, liver, and lung cancer. The adverse effects of inorganic arsenic exposure reported in children include skin lesions, neurodevelopmental effects (IQ and related effects), lung disease expressed in later years, and reproductive effects (decreased birth weight, spontaneous abortion, neonatal death). [74]

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[72] USEPA (1995) Compilation of Air Pollutant Emission Factors AP 42, Fifth Edition, Volume I, Chapter 11.6 Portland Cement Manufacturing. (Attached).

[73] The summary of health effects that follows is from 70 Fed. Reg. 59402, 59406-08 (Oct. 12, 2005) (Attached).

[74] CalEPA, OEHHA.2007 Technical Support Document For the Derivation of Noncancer Reference Exposure Levels (Attached).

Chromium[75]
Chromium may be emitted in two forms, trivalent chromium (chromium III) or the more toxic hexavalent chromium (chromium VI). Hexavalent chromium is a known human carcinogen. Hexavalent chromium is known to cause cancer, primarily in the lungs, but tumors in the stomach and intestinal tract have also been reported. Additional effects associated with exposure to hexavalent chromium compounds in human and animal studies include: respiratory effects (nasal and lung irritation, altered pulmonary function), gastrointestinal effects (irritation, ulceration and nonneoplastic lesions of the stomach and small intestine), hematological effects (microcytic, hypochromic anemia), and reproductive effects (effects on male reproductive organs, including decreased sperm count and histopathological change to the epididymis). The respiratory tract is the major target organ for hexavalent chromium toxicity for inhalation exposures. Bronchitis, decreases in pulmonary function, pneumonia, and other respiratory effects have been noted from chronic high does exposure in occupational settings due to hexavalent chromium. Limited human studies suggest that hexavalent chromium inhalation exposure may be associated with complications during pregnancy and childbirth, while animal studies have not reported reproductive effects from inhalation exposure to hexavalent chromium.

Lead[76]
Lead exerts ‘‘a broad array of deleterious effects on multiple organ systems via widely diverse mechanisms of action,” including effects on heme biosynthesis and related functions; neurological development and function; reproduction and physical development; kidney function; cardiovascular function; and immune function. In particular, lead is associated with neurological, hematological, and immune effects on children, and hematological, cardiovascular and renal effects on adults. Children are particularly sensitive to the effects of lead. Functional manifestations of lead neurotoxicity during childhood include sensory, motor, cognitive and behavioral impacts. Cognitive effects of special concern include decrements in IQ scores and academic achievement, as well as attention deficit problems. Children in poverty and black, non-Hispanic children face higher exposures to lead and are consequently more susceptible to lead’s health impacts. Reproductive effects, such as decreased sperm count in men and spontaneous abortions in women, have been associated with lead exposure. There is also some evidence of lead carcinogenicity, primarily from animal studies, together with limited human evidence of suggestive associations. EPA has classified lead as a probable human carcinogen.

Manganese
Chronic inhalation in humans results primarily in central nervous system effects. Visual reaction time, hand steadiness, and eyehand coordination were affected in chronically-

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[75] Chromium health impacts are primarily derived from US DHHS, ATSDR. 2008. Draft Toxicological Profile For Chromium (Attached).

[76] The lead health impacts are also derived from the final rule on the National Ambient Air Quality Standards for Lead, 73 Fed. Reg. 66964, 66975-76 (Nov. 12, 2008) (Attached).

exposed workers. Impotence and loss of libido have been noted in male workers afflicted with manganism attributed to inhalation exposures. In addition, exposures to low levels of manganese have been linked to subtle deficits in cognitive and neurobehavioral functions in both adults and children. Neurodevelopmental deficits have been associated with early life exposure to excessive manganese and include impaired intellectual performance and behavioral disinhibition.[77]

Nickel
Nickel dermatitis, consisting of itching of the fingers, hand and forearms, is the most common effect in humans from chronic exposure to nickel. Respiratory effects have also been reported in humans from inhalation exposure to nickel. No information is available regarding the reproductive of developmental effects of nickel in humans, but animal studies have reported such effects, although a consistent dose-response relationship has not been seen. Human and animal studies have reported an increased risk of lung and nasal cancers from exposure to nickel refinery dusts and nickel subsulfide. Animal studies of soluble nickel compounds i.e., nickel carbonyl) have reported lung tumors. The EPA has classified nickel refinery subsulfide as a Group A, human carcinogen and nickel carbonyl as a Group B2, probable human carcinogen.

Selenium
Selenium is a naturally occurring substance that is toxic at high concentrations. Studies of humans chronically exposed to high levels of selenium in food and water have reported discoloration of the skin, pathological deformation and loss of nails, loss of hair, excessive tooth decay and discoloration, lack of mental alertness, and listlessness. The consumption of high levels of selenium by pigs, sheep, and cattle has been shown to interfere with normal fetal development and to produce birth defects. Results of human and animal studies suggest that supplementation with some forms of selenium may result in a reduced incidence of several tumor types. One selenium compound, selenium sulfide, is carcinogenic in animals exposed orally. EPA has classified selenium sulfide as a Group B2, probable human carcinogen.

In addition to the health risks due to the toxicity of non volatile metal HAPs emitted by cement plants, new research demonstrates that the metals content of particulate matter poses a significant health risk though inhalation. The transition metals (including the nonvolatile HAPs Nickel, Chromium and Manganese) have multiple stable oxidation states and therefore contribute to oxidative reactions and produce reactive oxygen species (ROS). It is through the production of ROS that metals are thought to contribute to the toxicity of PM[78], and transition metals are in fact the major causative

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[77] CalEPA, OEHHA.2007 Technical Support Document For the Derivation of Noncancer Reference Exposure Levels (Attached).

[78] Donaldson K, Stone V, Borm PJA, Jimenez LA, Gilmour PS, Schins RPF, et al . Oxidative stress and calcium signaling in the adverse effects of environmental particles (PM10). Free Rad. Biol. Med. 34:1369-82, 2003. (Attached).

agents in the production of ROS[79]. Free radicals generated by metals[80] [81] [82] may contribute to epithelial damage, increased permeability, and an inflammatory response leading to the decrement of lung function.[83] Toxicological studies have linked the metal content of particulate matter to pulmonary toxicity, infectious diseases, cardiovascular toxicity, and allergic effects. Although epidemiologic data is limited at this time, studies have documented an association between metals content of particulate matter and air pollution associated mortality.[84] [85] Taken together these studies demonstrate that metal emissions from cement plant in the particulate form may pose health risks at very low levels and therefore stringent emission controls are needed.

B. The Proposed Standard Meets the Requirements of the Clean Air Act.

As discussed above, in Section I.B, EPA's proposal to set the MACT floor for PM as a surrogate for non-volatile metal HAPs, for existing sources at the average of the lowest emitting 12 percent of the kilns for which it has data and for new sources at the emission level of the single lowest emitting source for new sources is consistent with the statute's requirements. 74 Fed. Reg. 21150-51, 21153-54; *see Cement Kiln Recycling Coalition v. EPA*, 255 F.3d 855, 861, 865 (D.C. Cir. 2001). Moreover, the proposed standard was calculated using applicable EPA procedures and is supported by scientifically valid statistical techniques.

In addition, in the Proposed Rule, EPA has justifiably "propos[ed] PM standards for area sources based on performance of MACT." 74 Fed. Reg. at 21138/1.

Section 112(k)(3)(B) of the CAA requires EPA to identify at least 30 HAP (so-called "urban HAP") that pose the greatest potential health threat in urban areas. 42 U.S.C. § 7412(k)(3)(B). Section 112(c)(3) of the Act requires EPA to regulate, under

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[79] Ghio AJ, Cohen MD. Disruption of iron homeostasis as a mechanism of biologic effect by ambient air pollution particles. Inhal. Toxicol. 17:709-716, 2005. (Attached).

[80] Prahalad AK, Soukup JM, Inmon J, Willis R, Ghio AJ, Becker S, et al . Ambient air particles: effects on cellular oxidant radical generation in relation to particulate elemental chemistry. Toxicol. Appl. Pharmacol. 158: 81-91, 1999. (Attached).

[81] Prahalad AK, Inmon J, Dailey LA, Madden MC, Ghio AJ, Gallagher JE. Air pollution particles mediated oxidative DNA base damage in a cell free system and in human airway epithelial cells in relation to particulate metal content and bioreactivity. Chem. Res. Toxicol. 14:879-887, 2001. (Attached).

[82] Roemer W, Hoek G, Brunekreef B, Clench-Aas J, Forsberg B, Pekkanen J, et al . PM10 elemental composition and acute respiratory health effects in European children (PEACE project). Pollution effects on asthmatic children in Europe. Eur. Respir. J. 15: 553-59, 2000. (Attached).

[83] Bergamaschi E, De Palma G, Mozzoni P, Vanni S, Vettori MV, Broeckaert F, et al. Polymorphism of quinine-metabolizing enzymes and susceptibility to ozone-induced acute effects. Am. J. Respir. Crit. Care Med. 163:1426-1431, 2001. (Attached).

[84] Schwarze PE, Øvrevik J, Lag M, Refsnes M, Nafstad P, Hetland RB, et al. Particulate matter properties and health effects: consistency of epidemiological and toxicological studies. Hum. Exp. Toxicol. 25:559-79, 2006. (Attached).

[85] See attached literature review, entitled *Literature Review of Metal-Associated Adverse Health Effects of Particulate Matter* for a more detailed review of the adverse health effects of the metals content of particulate matter.

Exhibit D

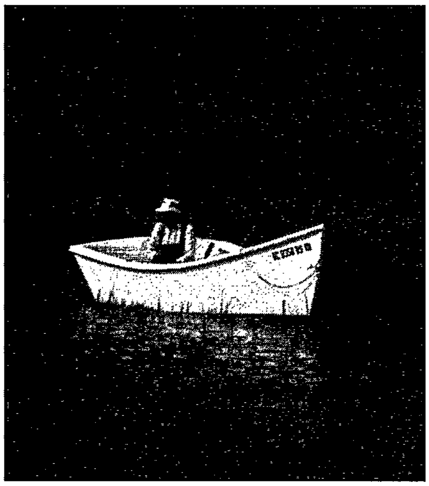
United States
Environmental Protection
Agency

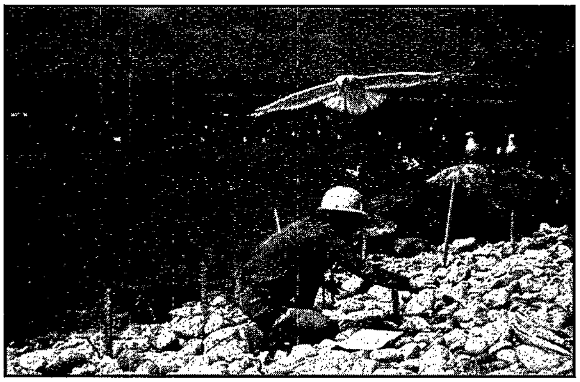
Office of Air Quality
Planning and Standards
Research Triangle Park, NC 27711

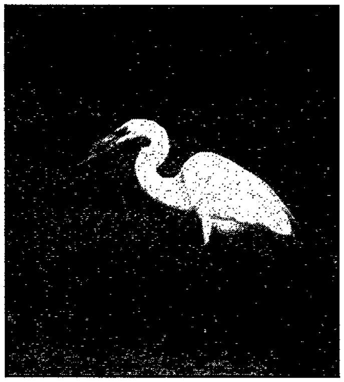
EPA-453/R-93-055
May 1994

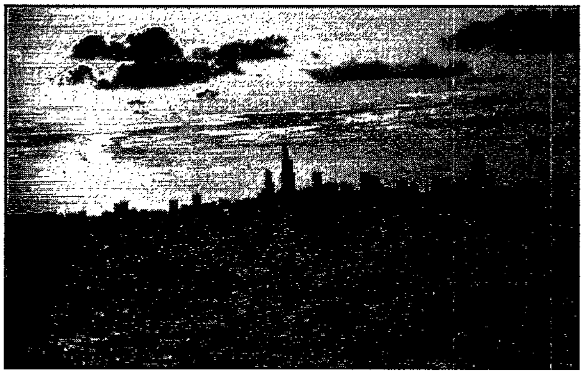
Deposition of Air Pollutants to the Great Waters

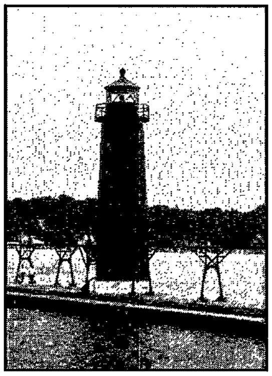
First Report to Congress











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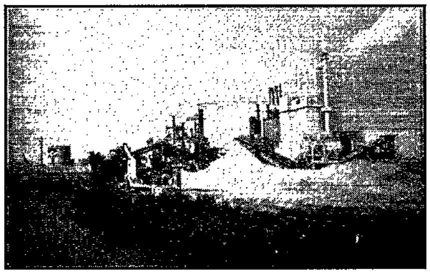
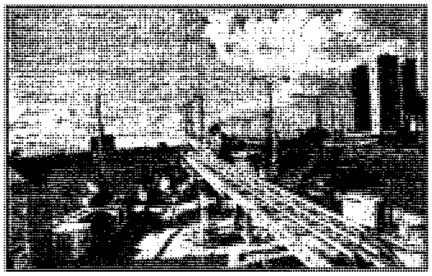




Appendices

Abbreviations and Acronyms

AAs	Assistant Administrators
ACTs	Achievable control technology documents
ANPR	Advance notice of proposed rulemaking
AWQC	Ambient water quality criterion or criteria
BCCs	Bioaccumulative chemicals of concern
CWA	Clean Water Act
DDE	Dichlorodiphenyldichloroethylene
DDT	Dichlorodiphenyltrichloroethane
EPA	U.S. Environmental Protection Agency
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
g	Gram
GLWQA	Great Lakes Water Quality Agreement
GLWQB	Great Lakes Water Quality Board
GLWQO	Great Lakes Water Quality Objective
HAP	Hazardous air pollutant
HCH	Hexachlorocyclohexane
IJC	International Joint Commission
kg	Kilogram
L	Liter
LQER	Lesser-quantity emission rates
MACT	Maximum achievable control technology
MCL	Maximum contaminant level
m^3	Cubic meter
mg	Milligram
NEP	National Estuary Program
NERRS	National Estuarine Research Reserve System
ng	Nanogram
NOAA	National Oceanic and Atmospheric Administration
NO_x	Oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
pGLWQC	Proposed Great Lakes water quality criteria
POM	Polycyclic organic matter
ppb	Parts per billion
ppm	Parts per million
ppt	Parts per trillion
RAs	Regional Administrators
TCDD	Tetrachlorodibenzo-p-dioxin
TCDF	Tetrachlorodibenzofuran
TSCA	Toxic Substances Control Act
WHO	World Health Organization
yr	Year

James F. Parnell

Executive Summary

Pollutants emitted into the atmosphere are transported various distances and can be deposited to aquatic ecosystems far removed from their original sources. Scientific studies show that atmospheric deposition is often an important factor in the degradation of water quality and the associated adverse health and ecological effects in studied waterbodies. In response to the mounting information indicating that air pollution contributes significantly to water pollution, Congress included section 112(m), referred to as the Great Waters program, in the Clean Air Act, as amended in 1990 (1990 Amendments). This report fulfills the Act's requirement for a Report to Congress 3 years after enactment.

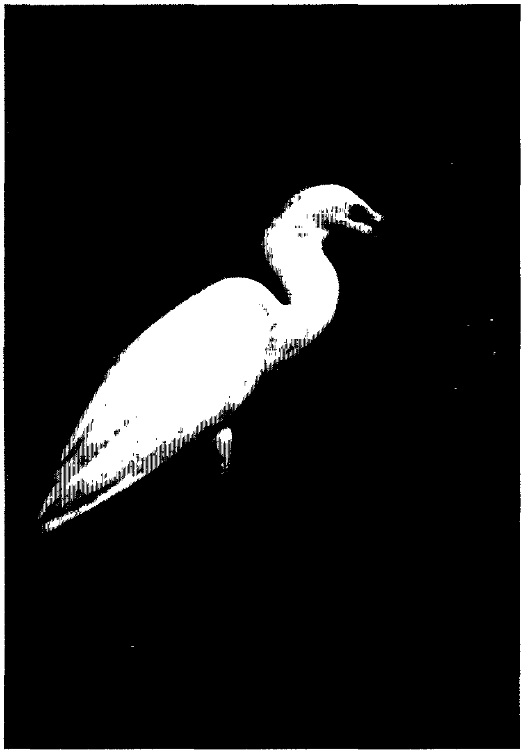
The purpose of the Great Waters program is to evaluate the atmospheric deposition of air pollutants to the Great Lakes, Lake Champlain, Chesapeake Bay, and coastal waters. The report to Congress is to include information on the contribution of atmospheric deposition to pollutant loadings, the environmental or public health effects of such pollution, the source or sources of such pollution, and a description of any regulatory revisions under applicable Federal laws that may be necessary to assure protection of human health and the environment.

The scientific information currently available is summarized in this report, and recommended actions are described.

Water quality conditions in the Great Lakes and many other waterbodies are greatly improved compared to a few decades ago, the result of environmental regulatory programs and public and industrial cleanup efforts addressing primarily waterborne pollution. However, despite the improvements, the Great Waters ecosystems are far from fully recovered, and it is necessary to address the more diffuse sources of pollution, including the air component, in order to attain water quality goals and to ensure protection of human health and the environment.

Pollutants of concern to the Great Waters possess certain common characteristics. They persist in the environment and, thus, can travel great distances, often being deposited and reemitted many times. These pollutants accumulate in the environment, making the potential for exposure to them greater than for pollutants that readily degrade. The potential for long-distance transport is evident by the presence of pollutants in remote, pristine environments such as the Arctic.

Pollutants of concern also accumulate in body tissues and magnify up the food web, with each level accumulating the toxics from its diet and passing the burden along to the animal in the next level of the food



James F. Parnell

web. Top consumers in the food web, usually consumers of large fish, may accumulate chemical concentrations many millions of times greater than the concentrations present in the water. As a result of unsafe concentrations of chemicals in fish, due to biomagnification, fish consumption advisories have been issued in hundreds of waterbodies nationwide, including the Great Lakes. High-risk groups, which fish consumption advisories are established to protect, include breast-feeding mothers because breast-fed babies continue to accumulate from their mothers after birth. For example, they can have PCB levels four times higher than their mothers after 6 to 9 months of breast-feeding. Other groups at high risk are subpopulations such as sport anglers, Native Americans, and the urban poor, who tend to have high fish consumption. EPA and other agencies are addressing this environmental justice issue by examining impacts to higher-risk populations and taking this into consideration in regulating activities.

Significant adverse effects on human health and wildlife have been observed due to exposure, especially through fish consumption, to persistent pollutants that bioaccumulate. Adverse effects range from immune system disease and reproductive problems in wildlife to subtle developmental and neurological impacts on children and fetuses.

Although most of the chemicals of concern are probable human carcinogens, many are also developmental toxicants capable of altering the formation and function of critical body systems and organs. Therefore, the developing embryo and fetus and breast-fed infants are particularly sensitive to these chemicals.

Ecological effects attributable to pollutants of concern are significant and can be subtle or delayed in onset, such as immune function impairment, reproductive problems, and neurological changes—all of which can affect population survival.

Other adverse ecological effects are caused by nitrogen compounds. Nitrogen compounds from atmospheric deposition exacerbate nutrient enrichment (or eutrophication) of coastal waterbodies, which results in impacts that range from nuisance algal blooms to the depletion of oxygen with resultant fish kills.

Studies show that significant portions of loadings to the Great Waters of the pollutants of concern are coming from the atmosphere. For example, 76 to 89 percent of PCBs to Lake Superior and up to 40 percent of nitrogen loadings to the Chesapeake Bay are estimated to come from air pollution. However, insufficient data are available to generalize the atmospheric loadings to all waters. Absolute quantities of deposited pollutants are also important, especially since loadings of even small amounts of pollutants that bioaccumulate can result in significant pollutant burdens in fish.

Pollutants of concern in the Great Waters originate from sources that are local to, as well as distant from, the impacted waters. Transport distances depend on the characteristics of the chemicals and source emissions as well as weather patterns. As such, generalizing source identification from one waterbody to another would not be accurate. More data are needed to determine sources and source categories affecting the Great Waters.

Uncertainties in current information are significant, and further research is needed to better characterize the most important information for decisionmakers. However, adequate information is available to lead EPA to the conclusion that some actions are justified and necessary at this time. Adverse effects of the chemicals of concern are evident and studies of selected waters show significant proportions of toxic pollution coming from the atmosphere. However, because the linkage between specific sources and subsequent deposition and effects has yet to be demonstrated, the kinds of actions described in this report focus on the chemicals of concern rather than on specific sources.

EPA considered the implications of action and of inaction, while recognizing that section 112(m) of the 1990 Amendments mandates that EPA should act to "prevent" adverse effects and to "assure protection of human health and the environment." EPA's recommendation is that reasonable actions are justified, based on evaluation of the scientific information currently available, and should now be taken and that research should continue. The National Oceanic and Atmospheric Administration (NOAA) concurs with this recommendation.

Most of the actions EPA will undertake focus on utilizing regulatory mechanisms in the Clean Air Act that are intended to address the most hazardous chemicals. EPA believes that the characteristics of toxicity, persistence, and tendency to bioaccumulate warrant special treatment of the Great Waters pollutants of concern and that this is consistent with congressional intent for those regulatory mechanisms and for section 112(m).

The recommendations from the report fall into three strategic themes. First, EPA will continue ongoing efforts to implement section 112 and other sections of the Clean Air Act and use the results of this report in the development of policy that will reduce emissions of Great Waters pollutants of concern. Under this theme, EPA will take actions that include: publishing emission standards affecting important chemicals of concern ahead of schedule, where possible; evaluating the adequacy of control technologies for important pollutants; publishing an advance notice of proposed rulemaking (ANPR) for establishment of lesser-quantity emission rates (LQERs) to define smaller sources to be regulated as "major sources" and evaluating which Great Waters pollutants warrant establishment of an LQER; evaluating which area sources should be regulated with maximum achievable control technology (MACT); and considering appropriate emission levels requiring regulation when sources are modified.

Second, EPA recognizes the need for an integrated multimedia approach to this problem and, therefore, will utilize authorities beyond the Clean Air Act to reduce human and environmental exposure to pollutants of concern. Under this theme, EPA will take actions that include using the Great Waters Core Project Management Group as a coordinating body to communicate with other offices/agencies. The objectives will be to: coordinate work and especially to identify lead offices to implement recommendations; support changes to the Clean Water Act that address nonwaterborne sources of water pollution; address the exportation of banned pesticides; emphasize pollution prevention efforts to reduce environmental loadings of pollutants of concern; and facilitate information sharing between EPA and other agencies.

Third, EPA will continue to support research activities and will develop and implement a program strategy to define further necessary research. Under this theme, EPA will take actions that include: focusing research planning on a mass-balance approach to determine relative loadings; using an appropriate mix of monitoring, modeling, and emission inventory tasks in conducting mass-balance work; assessing the need for tools to be developed for risk assessment for total exposure to pollutants of concern and for regulatory benefits assessment; and continuing to support ongoing research efforts.

preliminary findings in different settings by different investigators. Using these and other tools, scientists frequently can accumulate enough information to determine the likely causes of a given effect.

Effects: What Human Health and Environmental Effects Are Associated with Exposure to Great Waters Pollutants of Concern?

In assessing exposure and effects, consideration must be given to both human health and environmental effects (and the exposures that cause both types of effects). Both types of effects are important in their own right, and, in many cases, ecological effects are early indicators of human health effects. For example, pollutants in water that accumulate in the tissues of fish may result in direct effects in fish-eating birds, such as decreased populations. These ecological effects, in turn, may be indicators of potential human health effects related to the consumption of contaminated fish. In a widely circulated 1990 report, *Reducing Risk: Setting Priorities and Strategies for Environmental Protection*, EPA's Science Advisory Board strongly emphasized the very close link between human health and ecological health and pointed out that "most human activities that pose significant ecological risks . . . pose direct or indirect human health risks as well."[12]

The mandates of section 112(m) of the 1990 Amendments require EPA to assess the environmental and public health effects caused by water pollution attributable to atmospheric deposition to the Great Waters and to determine whether pollutant loadings to the Great Waters cause or contribute to exceedances of drinking water or water quality standards (including, for the Great Lakes, violations of the specific objectives of the Great Lakes Water Quality Agreement). Although a large number of pollutants are potentially of concern for atmospheric deposition, this report focuses on only 15 pollutants. Table 2 lists the 15 pollutants addressed in this report, along with examples of their uses (and use restrictions) in the United States. Thirteen of these pollutants are on the 1990 Amendments list of air pollutants; dieldrin and nitrogen are not on the list. All 15 are known air pollutants in the vicinity of at least some of the Great Waters, and all are known to be present in atmospheric deposition (e.g., rainfall). Data indicate that they are present in the Great Waters and that atmospheric deposition is a pathway by which they reach the waterbodies. All of the pollutants, with the exception of nitrogen, are of concern because of their persistence in the environment (length of time a pollutant remains in the environment), potential to bioaccumulate (potential to accumulate in living organisms), and toxicity to humans and the environment. The range of potential effects associated with exposure to these pollutants (except for nitrogen) includes cancer, effects to the reproductive system, developmental effects (i.e., effects on the developing human, including effects on embryos, fetuses,

Scientific Questions

- **Effects**
  What human health and environmental effects are associated with pollutants of concern in the Great Waters?
- **Relative Loading**
  What is the relative importance of atmospheric deposition in causing contamination in the Great Waters?
- **Sources**
  What sources are significant contributors to atmospheric loadings to the Great Waters?

Regulatory Question

- **Regulatory**
  Is action warranted to reduce atmospheric deposition?

Table 2. Selected Pollutants of Concern in the Great Waters[a]

Pollutant	Examples of Uses[b]
Cadmium and compounds	Naturally occurring element used in metals production processes, batteries, and solder. Often released during combustion of fossil fuels and waste oil and during mining and smelting operations.
Chlordane	Insecticide used widely in the 1970s and 1980s. All U.S. uses except termite control canceled in 1978; use for termite control voluntarily suspended in 1988. Use of existing stocks permitted.
DDT/DDE	Insecticide used widely from introduction in 1946 until significantly restricted in U.S. in 1972. Still used in other countries. Used in U.S. for agriculture and public health purposes only with special permits.
Dieldrin	Insecticide used widely after introduction in late 1940s. Used in U.S. for termite control from 1972 until registration voluntarily suspended in 1987.
Hexachlorobenzene	Fungicide used as seed protectant until 1985. Byproduct of chlorinated compound and pesticide manufacturing. Also a byproduct of combustion of chlorine-containing materials. Present as a contaminant in some pesticides.
α-Hexachlorocyclohexane (α-HCH)	Component of technical-HCH, an insecticide for which use is restricted in U.S., but used widely in other countries.
Lindane (γ-Hexachlorocyclohexane) (γ-HCH)	Main component of lindane, an insecticide used on food crops and forests, and to control lice and scabies in livestock and humans. Currently used primarily in China, India, and Mexico. U.S. production stopped in 1977. Use was restricted in 1983; however, many uses are still registered, but are expected to be voluntarily canceled in the future.
Lead and compounds	Naturally occurring element commonly used in gasoline and paint additives, storage batteries, solder, and ammunition. Released from many combustion and manufacturing processes and from motor vehicles. Use in paint additives restricted in U.S. in 1971. U.S. restrictions on use in gasoline additives began in 1973 and have continued through the present, with a major use reduction in the mid-1980s.
Mercury and compounds	Naturally occurring element often used in thermometers, electrical equipment (such as batteries and switching equipment), and industrial control instruments. Released from many combustion, manufacturing, and natural processes. Banned as paint additive in U.S., for interior paint (1990) and for exterior paint (1991).
Polychlorinated biphenyls (PCBs)	Industrial chemicals used widely in the U.S. from 1929 until 1978 for many purposes, such as coolants and lubricants and in electrical equipment (e.g., transformers and capacitors). In the U.S., manufacture stopped in 1977 and uses were significantly restricted in 1979. Still used for some purposes because of stability and heat resistance, and still present in certain electrical equipment used throughout U.S.
Polycyclic organic matter (POM)[c]	Naturally occurring substances that are byproducts of the incomplete combustion of fossil fuels and plant and animal biomass (e.g., forest fires). Also, byproducts from steel and coke production and waste incineration.
2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	Byproduct of combustion of organic material containing chlorine and of chlorine bleaching in pulp and paper manufacturing. Also a contaminant in some pesticides.
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	Byproduct of combustion of organic material containing chlorine and of chlorine bleaching in pulp and paper manufacturing. Also a contaminant in some pesticides.
Toxaphene	Insecticide used widely on cotton in the southern U.S. until the late 1970s. Most U.S. uses banned in 1982; remaining uses canceled in 1987.
Nitrogen compounds	Byproducts of combustion processes and motor vehicles. Also, compounds used in fertilizers.

[a] Data for this table are taken from References 13 through 27.

[b] Applicable restrictions (including bans) on use or manufacture in the United States also are described.

[c] POM is a large class of chemicals consisting of organic compounds having multiple benzene rings and a boiling point greater than 100 °C. Polycyclic aromatic hydrocarbons (PAHs) are a chemical class that is a subset of POM.

and children), neurological effects (i.e., effects on the brain and nervous system), effects on the endocrine system (i.e., effects on hormone production and function), and other noncancer effects (e.g., liver or kidney damage). The potential for effects will depend on the level and duration of exposure and the sensitivity of the exposed organism.

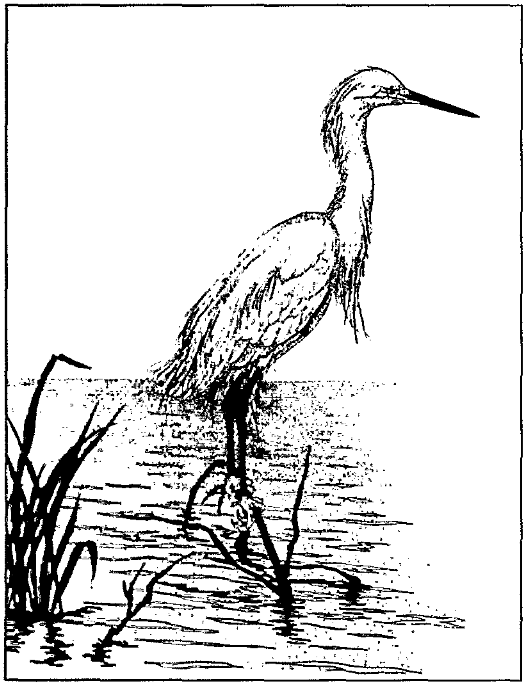
Furthermore, although some differences exist, the pollutants in Table 2 overlap substantially with several sets of Great Lakes chemicals of concern selected by other scientific and regulatory groups, and they also are generally consistent with the toxic air pollutants that ranked the highest in a 1991 EPA study to identify priority chemicals for the Great Waters Program.[28] In addition, all of the pollutants in Table 2, except 2,3,7,8-TCDF and nitrogen compounds, are included on the list of pollutants that are the initial focus of the EPA/State Great Lakes Water Quality Initiative, and 10 of the 15 Great Waters pollutants of concern are designated as chemicals of concern that have the potential to bioaccumulate (the highest priority group).[29]

These pollutants, excluding nitrogen, are also of concern based on the priorities set by the Great Lakes Water Quality Board (GLWQB) of the International Joint Commission, which is an advisory committee comprised of representatives from the United States and Canada. In addition, 5 of the 15 pollutants (cadmium, benzo[*a*]pyrene [indicator for polycyclic organic matter (POM)], lead, mercury, and PCBs) are on the Chesapeake Bay Toxics of Concern List, and two (dieldrin and toxaphene) are on the list of potential substances to be added to the Chesapeake Bay list.

Nitrogen compounds were added to the list of pollutants considered in this report because of nitrogen's role in nutrient enrichment in coastal waters and because data indicate that atmospheric loadings of nitrogen to Chesapeake Bay are significant. Accelerated eutrophication, which results from excessive loadings of nitrogen, can cause ecological effects such as reduced fish and shellfish populations.

The first 14 pollutants in Table 2 represent air pollutants of priority concern for the Great Lakes. Because of the potential for these 14 pollutants to cause harm in the Great Lakes, it is likely that they have the potential to cause harm in other fresh water systems as a result of their tendency to bioaccumulate in living organisms, to persist in the environment, and to be toxic to humans and ecosystems. However, the pollutants listed in Table 2 are not inclusive of all chemicals that may, now or in the future, be an important component of atmospheric deposition to the Great Lakes or other Great Waters.

Other pollutants are of potential concern for the effects that they may cause after being deposited to the Great Waters. In the proposed Water Quality Guidance for the Great Lakes Systems, 28 "bioaccumulative chemicals of concern" (BCCs), many of which are air pollutants, are identified. A BCC is defined as "any chemical which, upon entering the surface waters, by itself or as its toxic transformation product, bioaccumulates in aquatic organisms by a human health



Ecological Effects

Ecological effects associated with pollutants known to be present in atmospheric deposition are evident in numerous studies describing birth defects, reproductive failure, disease, and premature death in fish and wildlife species native to the Great Lakes.[8]

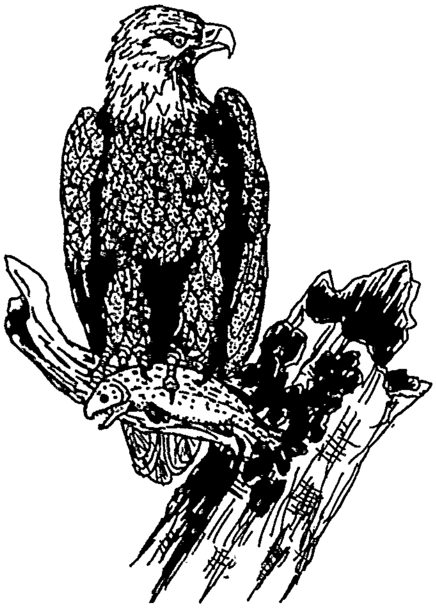
In general, ecological effects of exposure to toxic pollutants can occur at both the individual level and the ecosystem level. Effects at the individual level include both cancer and noncancer effects. There is a broad spectrum of noncancer effects, including changes in enzyme functioning and effects on the endocrine, immune, nervous, and reproductive systems. Effects at the ecosystem level may include changes in populations (e.g., reproduction rates) and communities (e.g., species diversity). Another effect, eutrophication, to which atmospheric deposition can contribute, can produce both individual- and ecosystem-level effects.

International Joint Commission

Ecological effects associated with pollutants of concern range from short-term, chemical-specific effects (e.g., fish disease, wildlife disease, effects on reproduction) to gradual, cumulative effects (e.g., population declines, community changes). Effects on the reproductive system can have negative impacts both on an individual's reproductive success and on the ecosystem by reducing a population's rate of reproduction. In addition, most pollutants of concern bioaccumulate to high levels in fish and fish-eating wildlife. At these higher exposure levels, fish and wildlife are more likely to suffer various cancer and noncancer effects. The remainder of this section briefly discusses some of the important effects of the pollutants of concern on aquatic organisms and other wildlife.

Effects on Aquatic Organisms and Other Wildlife. Several of the selected pollutants of concern cause changes in enzyme functioning. Studies have reported that the activity of enzymes responsible for the breakdown of foreign compounds is greatly increased by most of the chemicals of concern. In fish, the increased activity of these enzymes has been shown to result from exposure to PCBs and PAHs (PAHs are a subset of POM). In birds, "wasting" syndrome (i.e., the condition in which an animal slowly loses body weight until it can no longer sustain itself) has been related to altered enzyme activity resulting from exposure to environmental pollutants.

Effects on system functioning are reflected in findings of deficiencies in the immune system of beluga whales during a long-term study in the St. Lawrence River (located in the Great Lakes basin). This study indicated that these populations of beluga whales have significantly higher tissue concentrations of PCBs, DDT, and other toxic chemicals

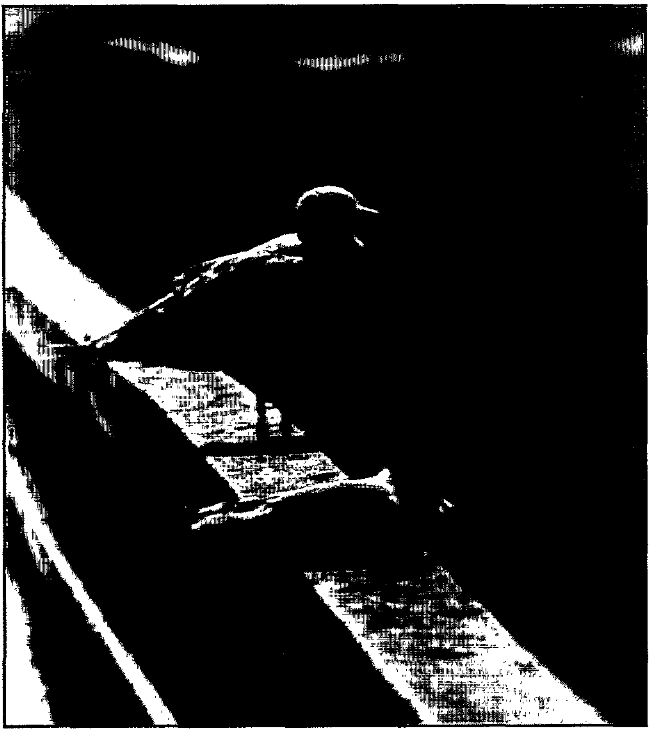


than other marine mammal populations. Researchers attributed the generally poor health of the St. Lawrence beluga whales to suppressed immune system activity resulting from exposure to environmental chemicals. Other studies in the Great Lakes region also have found associations between PCBs and DDT and decreased immune system function. In the Chesapeake Bay region, diminished immune response was demonstrated in bottom-dwelling fish of the Elizabeth River exposed to sediment contaminated with PAHs.

Particular concern is warranted for humans and other animals because of the effects these pollutants have on other body systems such as the nervous system (including behavioral effects) and endocrine system. Recent data indicate that effects to these systems may occur at very low exposure levels. For example, populations of Great Lakes herring gulls, Forster's terns, and ring-billed gulls have exhibited behavioral changes such as female-female pairings, which result in abnormal incubation activities and nesting behavior, including nest abandonment. Exposures to pollutants of concern have resulted in effects on the endocrine system such as thyroid disorders, loss of reproductive functions in certain species, deficiencies in hormones such as insulin, and changes in reproductive success related to hormone function.

Effects on the overall health of individual aquatic organisms are reflected in reports of skin and liver cancers in fish and beluga whales. In some cases, these cancers have been attributed to concentrations of PAHs. In one study of stranded beluga whales in the St. Lawrence River, tumors were discovered in 40 percent of the whales examined. In another study in the Great Lakes, bottom-feeding fish such as bullhead were found to have increased tumor occurrence and a broad variety of tumors. These tumors were linked to exposure to PAHs.

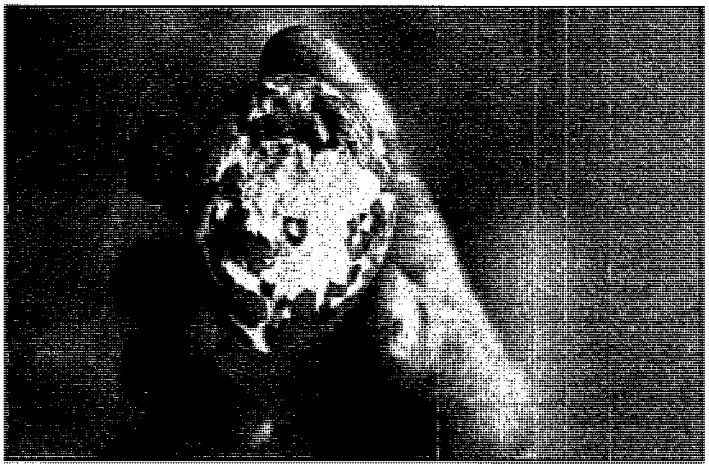
Effects on Great Waters ecosystems are evident in changes in fish communities present in the Great Lakes and Chesapeake Bay and population declines in many fish species. Another indicator of ecosystem effects is the drastic change in bottom-dwelling communities in the Great Lakes.[38] Exposure of these communities to toxic chemicals has resulted in significant changes in species diversity and populations.[38] In addition, populations of bottom-dwelling invertebrates have shown higher frequencies of deformed mouth parts and head capsules.[38] Changes in the ecosystem are reflected in other wildlife also.[38] Bald eagles, herring gulls, and Forster's terns in the Great Lakes region have undergone significant population declines since the 1960s.[38] Only in recent years, as concentrations of water pollutants in the Great Lakes have declined, have some species (e.g., bald eagles) begun to recover.[4]



Pat Cunningham, RTI

Reproductive Effects. Effects on reproduction include embryo toxicity, hatching success, abnormalities in offspring, parental behavior change, and changes in mating. These effects are often accompanied by higher concentrations of PCBs, DDT, dieldrin, and other chlorinated compounds in animals. Specific effects noted in various species include reduced fertility, reduced hatchability, reduced survival of offspring, impaired hormone activity, changed adult sexual behavior, and sparser shoreline populations relative to inland populations. Pollutants of concern that have been linked with reproductive impairment include toxic metals (e.g., cadmium, mercury, and lead), lindane, PCBs, DDT/DDE, dieldrin, and 2,3,7,8-TCDD.

Usually, observed reproductive effects cannot be linked conclusively to specific pollutants; however, linkages often are made through similarities of effects across species and geographic locations. For example, eggshell thinning in a number of bird species and associated reproductive loss are linked to DDT in the 1960s and 1970s, and decreases in environmental concentrations of DDT have resulted in population recoveries. However, populations in certain regions of the Great Lakes still exhibit reproductive failure. For example, bald eagle populations near the Great Lakes show much lower reproductive success than populations inland. Many eggs in shoreline nests contain lethal concentrations of PCBs, DDE, and dieldrin, resulting in bald eagle reproduction rates too low to maintain a population. In laboratory studies, mink that were fed PCB-contaminated fish responded with decreased reproduction and lower offspring survival. PCB levels in the fish used in that study were similar to those found in some regions of the Great Lakes.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Eutrophication. Eutrophication, which refers to the ability of a waterbody to produce organic material, is a natural process that takes place over geologic periods of time, but which can be accelerated by anthropogenic additions of nutrients (see Figure 6). Eutrophic lakes, which occur when nutrients such as nitrogen and phosphorus are present in excess amounts, are characterized by very high productivity and by high organic content from the decay of plants and recycling of carbon. In freshwater lakes, concentrations of phosphorus, which has only minor atmospheric inputs, generally are limited and therefore control productivity. Atmospheric deposition is not thought to be a major factor in eutrophication of freshwater lakes.

In coastal waters, nitrogen, which can have significant atmospheric inputs in the form of various nitrogen compounds, generally is the nutrient that controls eutrophication.

Eutrophication of a lake or estuary may result in undesirable effects such as oxygen depletion in the water or reduced oxygen levels, nuisance algal blooms, dieback of underwater plants (due to reduced light penetration), and reduced populations of fish and shellfish. The reduction in oxygen levels may reduce bottom-feeder populations, create conditions that favor different species, or cause dramatic fish kills, resulting in an altered food web. In fact, eutrophication recently has been identified by EPA as one of the most serious pollution problems facing estuarine waters of the United States.[45] The atmospheric deposition of nitrogen compounds can contribute significantly to eutrophication in coastal waters.

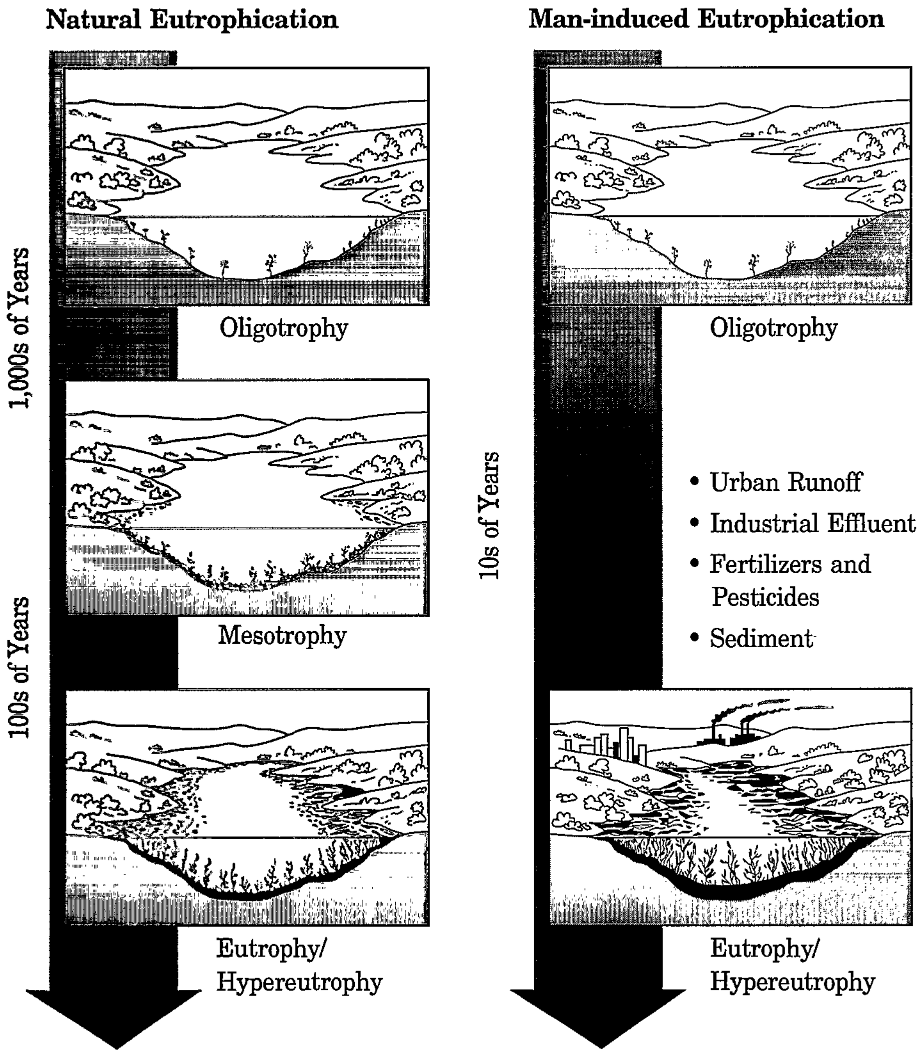


Figure 6. The eutrophication process.[44]

Human Health Effects

Unlike the documented effects of certain pollutants of concern on ecological health in the Great Waters, the effects on human health are not as easy to detect. The potential effects of the selected pollutants of concern, based largely on laboratory studies, range from a broad spectrum of noncancer effects on specific organs to probable human carcinogenicity. However, in thorough human studies, few of these effects have been proven to result from exposures to Great Waters pollutants of concern. Table 5 summarizes the potential human health effects for each of the selected pollutants of concern. Except for nitrogen compounds, all of these pollutants or common compounds of the pollutants bioaccumulate to some degree in humans. The range of effects includes cancer, reproductive effects, developmental effects (i.e., effects on the developing human, including effects on embryos, fetuses, and children), neurological effects (i.e., effects on the brain and nervous system), effects on the endocrine system (e.g., effects on hormone synthesis and function), and other noncancer effects (e.g., liver or kidney damage).

Table 5. Potential Human Health Effects[a] Associated with Pollutants of Concern[b]

Pollutant[d]	Potential Effects on Human Health[c]					
	Cancer[e]	**Reproductive/ Restrictions[f]**	**Neurological/ Behavioral**	**Immuno-logical**	**Endocrine**	**Other Noncancer[g]**
Cadmium and compounds	Probable[h]	●	●	●		Respiratory and kidney toxicity
Chlordane	Probable[h]	●[f]	●	●	●	Liver toxicity[h]
DDT/DDE	Probable[h]	●[h]	●[f]	●		Liver toxicity[h]
Dieldrin	Probable[h]	●[h]	●[f]	●	●	Liver toxicity[h]
Hexachloro-benzene	Probable[h]	●	●[h]	●	●	Liver toxicity[h]
α-HCH[i]	Probable[h]					Kidney and liver toxicity
Lindane	Probable[j]	● (γ-HCH)	●	●		Kidney and liver toxicity[h]
Lead and compounds	Probable[h]	●[k]	●[k]	●	●	Kidney toxicity[k]
Mercury and compounds		●	●	●	●	Kidney toxicity
PCBs	Probable[h]	●	●	●	●	Liver toxicity
Polycyclic organic matter	Probable[h]	●		●		Blood cell toxicity
2,3,7,8-TCDF	Not classifiable[h]	●		●	●	Liver toxicity
2,3,7,8-TCDD	Probable[j]	●[l]	●[l]	●[l]	●[l]	Integument toxicity[l]
Toxaphene	Probable[h]	●[f]	●[f]	●	●	Cardiovascular effects; liver toxicity[f]

[a] These data are based on a compilation of results from both human and animal studies. Potential for effects will depend on the level and duration of exposure and the sensitivity of the exposed organism.

[b] Where footnoted, data for this table are taken both from EPA sources [48-54] and the applicable Agency for Toxic Substances Disease Registry (ATSDR) Toxicological Profile [14-22, 24-26, 55]; otherwise, all data are taken from the applicable ATSDR Toxicological Profile alone.

[c] For this table, a chemical was considered to induce an effect if human or laboratory mammal data indicating a positive result were available. Blanks mean that no data indicating a positive result were found in the references cited (not necessarily that the chemical does not cause the effect).

[d] Nitrogen compounds are not included in this table because they are considered a pollutant of concern only for eutrophication.

[e] A chemical is classified as a "probable human carcinogen" when there is limited or no evidence of human carcinogenicity from epidemiologic studies but sufficient evidence of carcinogenicity in animals (corresponds to EPA weight-of-evidence category B). A chemical is classified as "not classifiable as to human carcinogenicity" when there is inadequate human and animal evidence of carcinogenicity or when no data are available (corresponds to EPA weight-of-evidence category D).

[f] Data from the applicable EPA Health Effects Assessment (HEA) document.[50-53]

[g] This is only a sample of other noncancer effects that may occur as a result of chronic exposure to the pollutant. Additional adverse human health effects may be associated with each chemical.

[h] Data from EPA's Integrated Risk Information System.[49]

[i] Toxicity data are available primarily for γ-HCH and technical-HCH (a mixture of several HCH isomers), with limited data available for α-HCH.

[j] Data from EPA's Health Effects Assessment Summary Tables (HEAST).[48] HEAST classifies these chemicals as probable human carcinogens; however, these carcinogenic evaluations are currently under review by EPA.

[k] Data from EPA's Reportable Quantity (RQ) Document for lead.[54]

[l] Data from *Biological Basis for Risk Assessment of Dioxins and Related Compounds.*[56]

In general, few of these chemicals are acute toxicants or genetic toxicants at concentrations found in the Great Waters; however, several are developmental toxicants that, through low-level exposures to parents, are capable of altering the formation and function of critical physiological systems and organs in children.

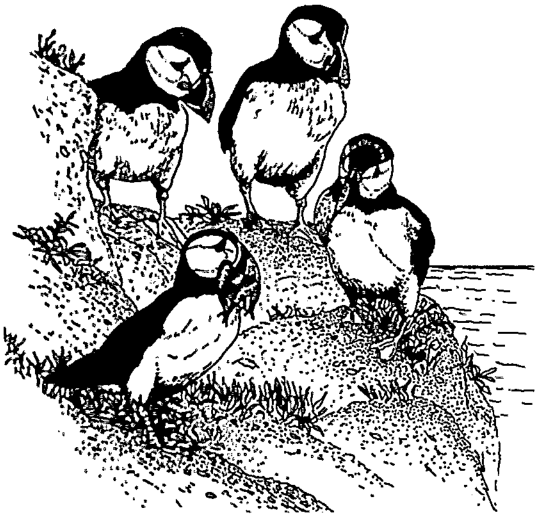
Two studies in the United States looked at infants and children who were nonoccupationally exposed to PCBs during prenatal development. Both studies found nervous system deficits. One study showed that children of mothers who ate PCB-contaminated fish (on average 2 to 3 meals per month of lake trout or salmon) from Lake Michigan before 1980 (when PCB concentrations in fish were higher than at present) exhibited deficits in cognitive function.[8] In another study, children in North Carolina showed motor abnormalities at birth and psychomotor delay at up to 2 years of age.[8] Both studies have generated controversy, mainly over study design, data analysis, selection of appropriate statistical tests, and even whether psychological tests are appropriate instruments in population studies.[46]

In a followup to the Lake Michigan study, the same children were evaluated at 4 years of age. These children were found to have subtle deficits in short-term memory and speed of information processing, which could impact the child's ability to master basic reading and arithmetic skills in school. An 11-year followup study on these children has begun.[47]

Summary of Current Understanding of Effects

1. What Are the Major Effects Associated with Pollutants of Concern for Atmospheric Deposition?

The potential human health and environmental effects associated with the selected pollutants of concern are generally well documented. In humans, the potential effects include cancer, reproductive and developmental effects, neurological effects, endocrine and immune system effects, and organ system toxicity. All of the pollutants of concern (except nitrogen compounds) are known to bioaccumulate in animals, including humans. In animals and plants, the potential effects of individual pollutants are not always well defined; however, linkages have been made between exposure to pollutants of concern and observed fish and bird deaths, reproductive effects, deformities in wildlife, and population declines. In the environment, it is difficult to relate a specific effect of concern (e.g., reproductive effects) to a single pollutant, because most affected animals have elevated body concentrations of many pollutants. It is known, however, that exposure to pollutants of concern can result in serious ecological and human health effects, particularly when animals are exposed to the pollutant through intake of food.



In addition, it is well established that nitrogen is usually the limiting nutrient controlling eutrophication in coastal waterbodies and that eutrophication in these systems can cause severe system-wide ecological effects.

2. What Is the Contribution of Atmospheric Deposition to Adverse Human Health and Environmental Effects?

The relationship between adverse effects of toxic pollutants and atmospheric deposition is not well understood. Some correlations and linkages between specific pollutants of concern and effects in the Great Waters can be established. Yet, at this time, quantifying the contribution of atmospheric deposition of each pollutant of concern to ecological and human health effects is not possible. For example, a pollutant may produce reproductive effects at a given concentration under certain exposure conditions, but the pollutant present in a waterbody generally is derived from many sources, and the link between an observed reproductive effect and atmospheric deposition is very difficult to determine.

Comparisons with Water Quality Benchmarks

As one means of assessing the significance of contamination of the Great Waters caused by the selected pollutants of concern, available water sampling data can be compared with various water quality criteria. Such comparisons are consistent with requirements in section 112(m) of the 1990 Amendments for EPA to assess the contribution of atmospheric deposition to exceedances of certain water quality standards and criteria. This section first describes several sets of relevant water quality benchmarks—EPA's national ambient water quality criteria (AWQC), EPA's recently proposed Great Lakes water quality criteria (pGLWQC), and the U.S.-Canadian Great Lakes water quality objectives (GLWQOs)—and then summarizes how the available Great Waters sampling data compare with the criteria. Because of limited sampling information for many of the selected pollutants of concern in Great Waters other than the Great Lakes, this summary focuses primarily on the Great Lakes.

This section compares water sampling data with water quality benchmarks, rather than comparing sediment contamination data or biological contamination data to appropriate benchmarks, for two main reasons: (1) the specific emphasis of section 112(m) requirements on water quality standards and benchmarks, and (2) the limited availability of Federal or other widely accepted numerical benchmarks for sediments or living organisms for the selected pollutants of concern. However, because of the strong tendency of most of the selected pollutants of concern to bind to sediments and to bioaccumulate, comparisons of sediment and biological contamination levels to appropriate benchmarks, where such benchmarks are available, has advantages over comparisons

Table 9. U.S. Sources of Air Pollutants of Concern[a]

Pollutant	Sources of Air Emissions
Cadmium and compounds	Fossil fuel combustion; aluminum production; cadmium, copper, lead, and zinc smelting; iron and steel production; battery manufacturing; hazardous waste and sewage sludge incineration; municipal waste combustion; petroleum refining; lime manufacturing; cement manufacturing; pulp and paper production; combustion of waste oil; pigment manufacturing; soil-derived dust; volcanoes.
Chlordane	Insecticide application[b]; volatilization from soils, water, and treated building foundations due to past insecticide application; suspension of eroded soil particles.
DDT/DDE	Insecticide application[b]; volatilization from soils and water due to past insecticide application.
Dieldrin	Insecticide application[b]; volatilization from soils and water due to past insecticide application.
Hexachlorobenzene	Manufacture of chlorine and related compounds; combustion of materials containing chlorine; pesticide manufacturing; municipal waste combustion; fungicide application[b]; volatilization from soils and water due to past fungicide application.
α-HCH	Insecticide application[b]; volatilization from soils and water due to past insecticide application.
Lindane	Insecticide application[b]; volatilization from soils and water due to past insecticide application.
Lead and compounds	Fossil fuel combustion; aluminum production; lead smelting; ferroalloys production; iron and steel production; battery manufacturing; hazardous waste and sewage sludge incineration; municipal waste combustion; petroleum refining; lime manufacturing; cement manufacturing; asphalt and concrete manufacturing; pulp and paper production; combustion of waste oil; paint application[b]; motor vehicles[b]; forest fires; suspension of eroded soil particles; volcanoes.
Mercury and compounds	Fossil fuel combustion; copper and lead smelting; hazardous waste, municipal waste, medical waste, and sewage sludge incineration; lime manufacturing; cement manufacturing; chlorine and caustic soda manufacturing; paint application[b]; suspension of eroded soil particles; evasion from soils and water; volcanoes.
PCBs	Incineration and improper disposal of PCB-contaminated waste; disposal of waste oil; malfunction of PCB-containing transformers and capacitors; electrical equipment manufacturing; pulp and paper production; volatilization from soils and water; municipal solid waste incineration and unregulated combustion.
Polycyclic organic matter	Combustion of plant and animal biomass and fossil fuels; municipal waste combustion; petroleum refining; steel production; coke byproduct recovery; aluminum production; plywood and particle board manufacturing; surface coating of auto and light duty trucks; asphalt processing; dry cleaning (petroleum solvent); fabric printing, coating, and dyeing; forest fires.
2,3,7,8-TCDF	Hazardous, industrial, and medical waste and sewage sludge incineration; municipal waste combustion; combustion of fossil fuels and organic materials containing chlorine; byproduct of various metals recovery processes, such as copper smelting; accidental fires of treated wood products and PCB-containing transformers and capacitors; improper disposal of certain chlorinated wastes; pesticide production, application, and spills; pulp and paper production; volatilization from, and erosion of, dust from landfill sites; forest fires.
2,3,7,8-TCDD	Hazardous, industrial, and medical waste and sewage sludge incineration; municipal waste combustion; combustion of fossil fuels and organic materials containing chlorine; byproduct of various metals recovery processes, such as copper smelting; accidental fires of treated wood products and PCB-containing transformers and capacitors; improper disposal of certain chlorinated wastes; pesticide production, application, and spills; pulp and paper production; volatilization from, and erosion of, dust from landfill sites; forest fires.
Toxaphene	Insecticide application[b]; volatilization from soils and water due to past insecticide application.
Nitrogen compounds	Fossil fuel combustion and other types of combustion; fertilizer application; animal waste.

[a] Data for this table are taken from References 5, 13 through 27, 71, and 72.
[b] Not currently a significant source in the United States due to manufacturing restrictions.

Exhibit E

ORAL ARGUMENT SCHEDULED FOR OCTOBER 11, 2011

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

NO. 10-1359 (and consolidated cases)

PORTLAND CEMENT ASSOCIATION, ET AL.,

PETITIONERS,

V.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, ET AL.,

RESPONDENTS.

ON PETITIONS FOR REVIEW OF FINAL AGENCY ACTION OF THE
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

SUPPLEMENTAL BRIEF FOR RESPONDENTS

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AUGUST 24, 2011

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* indicates authorities primarily relied upon

GLOSSARY

APA	Administrative Procedure Act
CAA	Clean Air Act
CEMS	Continuous Emissions Monitoring System
CISWI	Commercial and Industrial Solid Waste Incinerator
EPA	United States Environmental Protection Agency
HAP	Hazardous Air Pollutant
HCl	Hydrogen chloride
JA	Joint Appendix
MACT	Maximum Achievable Control Technology
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NSPS	New Source Performance Standards
PCA	Portland Cement Association, Ash Grove Cement Co., CEMEX, Inc., Eagle Materials Inc., Holcim (US) Inc., Lafarge North America Inc., Lafarge Midwest, Inc., Lafarge Building Materials Inc., Lehigh Cement Co., Riverside Cement Company, and TXI Operations, L.P., and Tile Council of North America
PM	Particulate Matter
RTC	Response to Public Comments
UPL	Upper Prediction Limit

STATEMENT OF THE CASE

EPA granted in part and denied in part PCA's petitions for administrative reconsideration of several aspects of the national emissions standards for hazardous air pollutants ("NESHAPs") from the portland cement industry ("2010 Cement NESHAP"), issued under 42 U.S.C. § 7412(d). 76 Fed. Reg. 28,318 (May 17, 2011) (JA1709). PCA filed a petition for review, which the Court consolidated with PCA's pending challenge to the 2010 Cement NESHAP. The Court also ordered supplemental briefing.

SUMMARY OF ARGUMENT

According to petitioners (collectively "PCA"), EPA must reconsider the 2010 Cement NESHAP because, after the close of the comment period on that rule, EPA proposed a definition of "solid waste" that might ultimately result in some cement kilns being reclassified as commercial and industrial solid waste incinerators ("CISWIs"). PCA fails to demonstrate that it was impractical to raise this objection during the comment period on the 2010 Cement NESHAP and that its objection is of central relevance to the outcome of that rule. PCA could have commented on EPA's decision to base the 2010 Cement NESHAP on the performance of all sources classified as cement kilns at the time of the rulemaking, but it chose not to. Even if PCA were correct that it could not have commented at that time, its concerns regarding the *proposed* solid waste definition are not of central relevance to the NESHAP because EPA must base emission standards on the information EPA possesses *at the time EPA takes action*. None of the devices in EPA's database could have been reclassified from cement kilns regulated under section 7412(d), to CISWIs regulated under 42 U.S.C. § 7429, based on a *proposed* definition of solid waste.

PCA also argues that it was unable to comment on the standards for particulate matter ("PM"), the standards for periods of startup and shutdown, and the monitoring requirements for kilns that use monovents. PCA could have submitted, and in fact did submit, comments on each of these points, and PCA fails in any event to establish that EPA was required to reconsider them.

Finally, PCA challenges EPA's decision not to stay the emission standards that apply to open clinker cooler piles, even though EPA agreed to reconsider those standards, but EPA's decision was reasonable and should be upheld.

STANDARD OF REVIEW

EPA "shall convene a proceeding for reconsideration of [a] rule" only if a person raising an objection can show, *first*, that it was impracticable to raise such objection during the public comment period or that the grounds for such objection arose after the public comment period, and *second*, that such objection is "of central relevance to the outcome of the rule." 42 U.S.C. § 7607(d)(7)(B). If EPA declines reconsideration, the objector may seek review of that decision under the narrow and deferential "arbitrary or capricious" standard of review. *Id.* § 7607(d)(9).

ARGUMENT

I. EPA PROPERLY DECLINED TO RECONSIDER THE 2010 CEMENT NESHAP.

A. The definition of solid waste.

EPA announced in the proposed NESHAP that the final cement standards would be based on the performance of all devices which were at that time classified as cement kilns regulated under section 7412(d). 74 Fed. Reg. 21,136, 21,138 (May 6, 2009) (JA0548); 76 Fed. Reg. at 28,320 (JA1711). PCA concedes it did not comment on this aspect of the proposal, but persists in its claim that it remained silent because it had "nothing of substance to say" until EPA proposed a draft solid waste definition. PCA Supp. Br. 5. PCA misses the point: as EPA explained, no devices *could* be reclassified as CIWSIs regulated under section 7429 based on a *proposed* solid waste definition. 76 Fed. Reg. at 28,320 (JA1711). Notwithstanding this, PCA *could* have objected to EPA's approach or suggested that EPA defer setting the NESHAP until the solid waste definition was final, but PCA chose not to.

PCA implies that it was somehow misled into withholding comment because EPA "promised" to revisit the NESHAP after the solid waste definition was final, PCA Supp. Br. 5, but EPA simply said that it would only reclassify kilns as

CISWIs if EPA adopted a final definition of solid waste *before* the NESHAP was promulgated, which did not happen. 76 Fed. Reg. at 28,321/2-3 (JA1712).

Even if PCA were correct that it could not have commented on this issue when the NESHAP was proposed, reconsideration is only required if PCA's objection is of central relevance to the outcome of the rulemaking. At the time EPA finalized the 2010 Cement NESHAP, all of the sources on which the NESHAP was based were cement kilns regulated under section 7412(d). The proposed solid waste definition does not change this fact. *Id*. at 28,321/3 (JA1712) (a NESHAP is "necessarily based on the snapshot-in-time assessment of performance within a source category"). The proposed definition thus could not be of central relevance to the outcome of the NESHAP because it could not affect the status of any cement kiln as of the time of the rulemaking. EPA was no more required to reconsider the 2010 Cement NESHAP than EPA would be required to reconsider the NESHAPs for other source categories whose sources were properly classified at the time of the respective NESHAP rulemaking but which burned secondary materials later proposed or defined to be solid wastes. *Id.*

B. The PM and Startup/Shutdown Standards and Monitoring Requirements.

PCA also contends that it lacked notice that EPA would convert limits derived from stack test data into 30-day continuously monitored standards, using the upper prediction limit ("UPL") equation. PCA Supp. Br. 5-6. EPA explained at proposal how the UPL equation converts individual values into long term values such as 30-day averages. 74 Fed. Reg. at 21,141-42 (JA0551-0552) (in the UPL equation, "if 30-day averages are used to determine compliance (m =30), the variability based 30-day average is much lower than the variability of the daily measurements in the data base, which results in a lower UPL for the 30-day average"). PCA criticized EPA's decision to use the UPL, and suggested a different statistical tool. *Data Analysis and Variability for Portland Cement Proposed NESHAP*, Appendix 1 to *PCA Comments on EPA's Proposed NESHAP for the Portland Cement Manufacturing Industry; Proposed Rule* ("*PCA Comments*") (EPA-HQ-OAR-2002-0051-2922.5) at 1-3 – 1-6 (JA0828-0831). PCA can hardly complain that it lacked notice and an opportunity to comment on the use of the UPL.

PCA similarly claims that it lacked notice of the "assumptions" that EPA used to establish emission standards that apply during periods of startup and shutdown. PCA Supp. Br. 6-7. EPA proposed to apply during periods of startup and shutdown the same standards as apply during periods of normal operation, because "startup and shutdown are both somewhat controlled operating modes for cement kilns." 74 Fed. Reg. at 21,162/1 (JA0572). However, EPA solicited comment on that approach, sought additional data, and advised that it might "set different standards for periods of start-up, shutdown, or malfunction" based on data and information EPA receives. *Id*. (emphasis added). PCA commented at length on the proposed startup/shutdown standards, noting among other things that startup and shutdown standards should not be expressed in terms of production units (*i.e.*, normalized) because kilns are not engaged in production activities during startup and shutdown. *PCA Comments* at 7-8 (EPA-HQ-OAR-2002-0051-2922.1) (JA0731-0732). In the final rule, EPA adopted standards for startup and shutdown that, as proposed, are numerically identical to the standards which apply during normal operations due to the controlled nature of these operating modes but which, consistent with PCA's comment, are not normalized to units of production. 76 Fed. Reg. at 28,323/1-2 (JA1714); 75 Fed. Reg. 54,970, 54,991-92 (Sept. 9, 2010) (JA1331-1332). PCA had an opportunity to comment, and did so.

Third, PCA claims EPA failed to provide in the proposed rule EPA's "justification" for the requirement that all facilities, including those using monovents, install continuous emissions monitoring systems ("CEMS"). PCA Supp. Br. 6-7. EPA proposed to require sources to use CEMS to measure compliance with the HCl, mercury, and total hydrocarbon limits, and solicited comment on whether also to require CEMS to determine compliance with the PM standard. 74 Fed. Reg. at 21,157/2-158/2 (JA0567-0568). One commenter asserted, among things, that the "cost to install CEMS and other proposed equipment is excessively burdensome for plants configured as Monovent." GCC of America Comments on Proposed Portland Cement MACT (EPA-HQ-OAR-2002-0051-2888.1) at 1 (JA0705). EPA explained why installing CEMS is not, as PCA now asserts, "impossible," PCA Supp. Br. 7, and that monovent kilns could petition to use alternative monitoring. *NESHAP from the Portland Cement Manufacturing Industry, Response to Comments Received on Proposed Rule Published on May 06, 2009, 74FR 21135* (EPA-HQ-OAR-2002-0051-3464) at 172-173 (JA1286-1287); 76 Fed. Reg. at 28,324/2 (JA1715). PCA continues to disagree with EPA's decision, but that is not a valid basis on which to require EPA to grant reconsideration.

II. EPA APPROPRIATELY DECLINED TO STAY THE RULE.

PCA asserts that EPA abused its discretion in denying PCA's request to stay the standards applicable to clinker storage piles, which EPA agreed to reconsider. PCA Supp. Br. 7-8. Although the APA allows EPA to "postpone the effective date of action taken by it, pending judicial review," that authority does not apply where, as here, an action's effective date has already passed. 76 Fed. Reg. at 28,326/2 (JA1717). PCA has not articulated why EPA's decision not to stay these standards was an abuse of EPA's discretion under the APA.

PCA also requests the Court to compel a stay if the Court concludes that EPA must reconsider either the impact of the proposed solid waste definition, the PM or startup/shutdown standards, or the CEMS requirement. PCA Supp. Br. 8.

However, reconsideration, even if ordered by the Court, does not establish that those standards are arbitrary and capricious, it simply means that EPA must re-evaluate them.

PCA asserts irreparable harm, PCA Supp. Br. 8, but as EPA explained, any uncertainty allegedly caused by the proposed solid waste definition has been eliminated by EPA's issuance of a final definition and final CISWI standards. 76 Fed. Reg. at 28,326/2 (JA1717). In addition, EPA found that although twenty-three kilns (out of 146) would have been CISWIs had the final solid waste definition been in place before EPA established the 2010 Cement NESHAP, the PM and HCl floors would have been virtually identical, and the mercury floor nearly so. *Id*. at 28,322 and Table 1 (JA1713); *Revised Floors without Kilns that Would have been CISWI Kilns Had the Solid Waste Definition Applied* (EPA-HQ-OAR-2002-0051-3580) (Apr. 25, 2011) at 3-4 (JA1654-1655). The only material change would have been in the total hydrocarbon standard, where one of the two kilns upon which EPA based the floor would have been a CISWI. However, the revised total hydrocarbon floor would have been *more* stringent than what EPA promulgated. 76 Fed. Reg. at 28,322 & n.11 (JA1713). Given the similarity of the emissions limits, it is difficult to see how PCA is harmed absent a stay. *Id*. at 28,326/2 (JA1717).

CONCLUSION

The Court should deny the petition for review.

Respectfully submitted,

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August 24, 2011

CERTIFICATE OF COMPLIANCE WITH WORD LIMITS

Pursuant to Fed. R. App. P. 37(a)(7)(C), and exclusive of the components of the brief excluded from the word limit pursuant to Fed. R. App. P. 32(a)(7)(B)(iii) and Circuit Rule 32 (a)(1), I certify that the foregoing Supplemental Brief of Respondent EPA contains 1998 words, as counted by the "word count" feature of my Microsoft Office Word software.

/s/ Daniel R. Dertke
DANIEL R. DERTKE

CERTIFICATE OF SERVICE

I hereby certify that all counsel of record who have consented to electronic service are being served with a copy of the foregoing Supplemental Brief for Respondent EPA via the Court's CM/ECF system on this 24th day of August, 2011.

/s/ Daniel R. Dertke
DANIEL R. DERTKE

Exhibit F

PCA
Portland Cement Association

VIA: regulations.gov

August 17, 2012

Docket No. EPA-HQ-OAR-2011-0817
Air and Radiation Docket
U.S. Environmental Protection Agency
Mail Code 2822T
1200 Pennsylvania Ave., N.W.
Washington, DC 20460

Re: Comments re National Emission Standards for Hazardous Air Pollutants for the Portland Cement Manufacturing Industry and Standards of Performance for Portland Cement Plants, Docket ID No. EPA-HQ-OAR-2011-0817; FRL-9629-9; RIN 2060-AQ93

Dear Sir/Madam:

I am writing to offer the comments of the Portland Cement Association (PCA) in response to the notice of proposed rules on reconsideration (hereafter "reconsideration notice") published in the *Federal Register* of July 18, 2012, at 77 Fed. Reg. 42368.

PCA is a trade association representing cement companies in the United States and Canada. PCA's U.S. membership consists of 25 companies operating 97 manufacturing plants in 36 states and distribution centers in all 50 states. Portland cement[1] accounts for approximately 93 percent of the cement production in the United States. Masonry and blended cement account for the remaining 7 percent. PCA members, who directly employ over 13,000 Americans, account for more than 95 percent of cement-making capacity in the United States.

PCA has worked with the EPA for many years on various environmental issues, including applicable NESHAP regulations. The Portland cement industry is committed to sound and responsible environmental stewardship and welcomes the opportunity to continue working with EPA to ensure a defensible and workable regulation.

PCA is generally supportive of many modifications which EPA has proposed. At the same time, aspects of some of the modifications being proposed raise certain practical operational concerns relating to our members operations. We believe that the proposed rule, with certain modifications to address the practical concerns we have identified, will accomplish the goal of reducing the emissions of hazardous air pollutants from cement

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[1] "Portland cement" is not a brand name. It is a generic term used to describe a specific type of cement.

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Appendices

- **A** "The Impact of a Change in the Cement NESHAP PM Limit On Compliance Strategies and Schedules" (April 9, 2012).
- **B** "Implications of Altered Particulate Matter Limit on PCA Technology Analysis" (May 24, 2012).
- **C** "Steven W. Miller Declaration".
- **D** PCA members' recently-completed plant compliance time-line assessments.
- **E** PCA's "Comments on the Current EPA Development of HCl CEMS Performance Specifications and Quality Assurance Procedures as Applied to Cement Kiln HCl Emissions" (April 22, 2012).
- **F** SSM Coalition "Comments on Proposed National Emission Standards for Hazardous Air Pollutant Emissions: Ferroalloys Production," Docket ID No. EPA–HQ–OAR–2010–0895 (Jan. 31, 2012).
- **G.** PCA's detailed matrix of regulatory sections whose proposed text needs to be revised and the revisions to the text that PCA recommends.

> identified, and a new bidding/procurement process undertaken. Significant plant redesign, in the form of new ductwork and new fan design, and the changes in the main control equipment may be needed.

77 Fed. Reg. at 42386.

Any changes to the PM standard are likely to impact the compliance strategy and equipment chosen to comply with the other standards. As EPA notes at 77 Fed. Reg. 42386**:**

> The proposal to amend the standard for PM has implications for all of the standards, not just those for PM. The standards for mercury, HCl and THC all rely (or may rely) on control strategies involving injection and removal of added particulates, whether in the form of activated carbon, or dry or wet sorbent injectant. See Docket item EPA-HQOAR-2002-0051-3438, section 2. A change in the PM standard thus affects these collateral PM control strategies as well.

EPA's proposal to reset of the compliance deadline to September 2015 for existing sources is based on ample data and information concerning, among other things, the list of legitimate practical considerations described by EPA. The same data development and analysis will be required for the planning, design, *et cetera*, of new and reconstructed sources as well.

As part of the court-ordered reconsideration process, EPA requested that PCA analyze the impact that a potential change in the PM limit under the 2010 cement NESHAP would have on the selection and potential implementation of optimal control strategies required to bring cement plants into compliance. Page 42386 of the reconsideration notice mentions that the results of PCA's analysis were shared with EPA, citing specifically two additional documents on which EPA also relies to justify the reset of the compliance deadline to September 2015: "The Impact of a Change in the Cement NESHAP PM Limit On Compliance Strategies and Schedules" (April 9, 2012), and "Implications of Altered Particulate Matter Limit on PCA Technology Analysis" (May 24, 2012). Each of these documents is discussed below.

1. <u>"The Impact of a Change in the Cement NESHAP PM Limit On Compliance Strategies and Schedules" (April 9, 2012)</u>: In this impact assessment document (hereafter referred to as the "IA"), PCA addressed three specific areas of impact that the 2010 final rule's PM limit of 0.04 lbs/ton of clinker would have on cement plants if modified to 0.06-0.08 lbs/ton of clinker:

- The impact on the selection and implementation of the most appropriate control strategy for PM;
- The effect of the change in the PM limit on the selection of the most appropriate control strategy for HCl, mercury, and THC under this rule; and

- The time needed to determine and implement the appropriate control strategies, once a revised PM limit is established.

While the IA that PCA submitted to EPA is incorporated into these comments by reference and a copy is also included with these comments as Appendix A, the following summary highlights why it further justifies and supports EPA's proposal to reset the compliance deadline to September 2015.

a. Selection and implementation of the most appropriate control strategy for PM: With respect to the first of these impacts, cement plants are currently controlling PM emissions either with an Electrostatic Precipitator (ESP) or a Baghouse, (or in the case of one location, with a gravel-bed filter). IA at 2. However, ESPs *cannot achieve* the 0.04 lbs/ton clinker limit. *Id.* Therefore, sources currently using ESPs will either need to be: (1) replaced with a baghouse, (2) converted to a baghouse, (3) modified to a hybrid design (where the back end of the ESP is converted to a baghouse configuration), or (4) supplemented with a polishing baghouse. *Id.*

Even though "baghouses are generally considered to be the most effective PM control devices for many types of sources, including cement," IA at 2, "[t]he 0.04 lb/ton of clinker PM limit is so strict that *a large number of sources with relatively new baghouses cannot meet the limit*." *Id.* (emphasis added). Thus, for sources controlled with baghouses that cannot meet 0.04 lb/ton clinker, such sources will either have to: (1) replace the baghouse, (2) increase the size of the baghouse, (3) add a second polishing baghouse, or (4) upgrade the filter materials and advanced instrumentation and controls. *Id.*

The control of PM is further complicated, and thus the need to reset the deadline further justified, by the fact that cement plants run on induced draft. As the IA explained:

> Changing the PM control device strategy (ESP to baghouse, ESP to hybrid, baghouse to bigger baghouse) will change the pressure drop over the system. A higher pressure drop with the same fan results in decreased flow. The required new fan design must be carefully matched to the final PM control device in order to maintain the correct flow.

IA at 2.

If EPA were to change the PM limit from 0.04 to within 0.06 to 0.08 lbs/ton clinker, as PCA had suggested in the IA, it would provide cement plants with at least one other different control option to consider – adding cyclones upstream of an existing ESP or baghouse. However, as the IA further explained, this additional option would also require additional time to implement, including requiring engineering of the ductwork, layout, and associated local permitting. IA at 2-3.

APPENDIX D

Cement Plant Timeline Compliance Assessments

The *Federal Register* notice for this rulemaking solicits additional information on the need for resetting the compliance deadline for the Portland Cement NESHAP to September of 2015. In response to this request, PCA asked its members to provide kiln specific information on the control strategy and schedule implications of this rule change, starting with an assumption that the rule would be finalized in December 2012. With the very short comment period, member companies were able to provide 18 compliance timeline assessments in a standardized format, covering 20 kilns (two of the timelines cover pairs of kilns at the same site), which are presented in the following matrix.

As explained below, these compliance timelines assessments provided demonstrate a clear need to reset the compliance deadline to at least September 2015:

- Control strategies are going to change as a result of the change in the PM limit. Some existing ESP will be retained, mostly with upgrades. Some existing baghouses will not need to be replaced.
- Because the two most promising controls for HCl and mercury involve sorbent injection and the collection of the dust in the particulate control equipment, those strategies are also changing.
- The motivation for changing strategies is not limited to the change in the PM limit. EPA has proposed new requirements for coal mills, raw material mills and clinker coolers that are also causing companies to alter their compliance strategies.
- Kiln owners have done significant work in preparation for MACT compliance (installing CEMS, conducting stack tests, doing preliminary designs, and in some cases getting bids) but only so much could be done while the emissions limits were being reconsidered and it was know that they were expected to change. A number of the timeline assessments show work that is underway now, in anticipation of the final rule. However, until a final rule is adopted, companies cannot finalize control approaches, complete the requisite engineering, solicit and review bids, contract for controls, install controls, test their performance and adjust operating methods accordingly. All of these steps take time.
- These timeline assessments demonstrate the need for to reset the compliance deadline to September of 2015, at the earliest. A longer extension will be needed if the publication of the final rule is delayed beyond December of this year, or the final requirements are more restrictive than proposed.
- A number of kilns would benefit with a compliance deadline reset beyond September 2015, in order to provide the sufficient time necessary to investigate fully alternatives to an RTO for THC control, or to avoid having to shutdown and connect controls in months of the year with historically high demand for cement.

Cement NESHAP Compliance Timeline

Kilns (two): F&G

Current Compliance Status (Relative to the Reproposal; Where Appropriate, Differentiate Among Stacks)

- Particulate: Compliant with reproposal limits, but exceeded previous limits
- HCl: Emissions less than proposed limits
- Mercury: Emissions less than proposed limits
- THC/organic HAP: Exceeds Limit

Likely Compliance Methods (Relative to the Reproposal; Where Appropriate, Differentiate Among Stacks)

- Particulate: No additional control required. Under the tighter limit a new bag filter or modifications to existing bag filter would have been required.
- HCl : None Required
- Mercury: None required
- THC/organic HAP: RTO installation

How the Reproposal has Changed the Likely Compliance Strategy (Relative to the Reproposal; Where Appropriate, Differentiate Among Stacks)

- Impact of new PM limit on Particulate Controls: No additional PM controls are required
- Impact of new PM limit on Controls for HCl, Mercury and/or THC: May be able to use alternate THC control before existing bag filter rather than before a new polishing bag filter
- Other Aspects of the Reproposal ...list the aspect and the impact:
    - Extension of compliance deadline due to reproposal allows additional time to continue testing of alternate solutions for THC reduction other than RTO installation i.e. SCR, FLS CataMax Ceramic Filter and other HAPS specific control technologies

Compliance Timeline: Provide detail on each activity and provide the start and stop dates for each activity.

Activity	Month and Year Each Activity Starts	Month and Year Each Activity Is Finished	Description of Task or Tasks Being Completed Under Each Activity
Testing THC Control Technologies	April 2012	Aug 2013	Continue with ongoing testing of alternate solutions for THC emission reduction
Selection of Control Solution	Sept 2013	Oct 2013	Evaluate results of testing and select solutions
Tendering	Nov 2013	Jan 2014	Issue requests for proposal to suppliers, review proposals, contract negotiations
Equipment Delivery	Feb 2014	Sept 2014	Manufacturing and delivery of equipment
Detailed Engineering	Jan 2014	July 2014	Finalize layout drawings, civil engineering, Mechanical design, electrical engineering, permitting, Tendering for construction
Construction/Equipment Installation	Oct 2014	April 2015	Civil construction and equipment installation
Commissioning	March 2015	May 2015	Testing of equipment
System Start up	May 2015	June 2015	Equipment start up
Testing and Optimization	June 2015	September 2015	Monitor and test emissions over a range of operating conditions. Optimize controls prior to the compliance deadline.

Cement NESHAP Compliance Timeline

Kiln: M

Current Compliance Status (Relative to the Reproposal; Where Appropriate, Differentiate Among Stacks)

- Particulate: Kiln - Existing ESP does not comply with the 2010 NESHAP Regulation continuously; Clinker Cooler Vent – Existing Jet Pulse Dust Collector has met the 2010 NESHAP limit as shown by three one-hour stack testing, but for long term continuous compliance needs upgrades.
- HCl: Comply with 3ppm limit.
- Mercury: Comply with 55 lb Hg per million st clinker limit.
- THC/organic HAP: Comply with 24 ppm limit

Likely Compliance Methods (Relative to the Reproposal; Where Appropriate, Differentiate Among Stacks)

- Particulate: Kiln - Existing ESP could comply with the reproposed NESHAP Regulation continuously, if upgrades where made to the ESP such as new transformers, wires and plates. The existing stack is used by two Kilns – Kiln #1 & #2. The single stack would be replaced with a stack for each kiln. Clinker Cooler Vent – Existing Jet Pulse Dust could comply with the reproposed NESHAP Regulation, but for long term compliance needs upgrades.
- HCl: None Required
- Mercury: None Required
- THC/organic HAP: None Required

How the Reproposal has Changed the Likely Compliance Strategy (Relative to the Reproposal; Where Appropriate, Differentiate Among Stacks)

- Impact of new PM limit on Particulate Controls: Originally, the kiln dust collector (ESP) would have been replaced with a new dust collector at a different location. A new stack was planned to correspond to the new dust collector location. If the existing ESP can be maintained and upgraded, the placement of the stack will change. Therefore engineering has to be done on the stack location, engineering review on the efficiency of upgrading the existing ESP and the structural condition of the ESP.
- Impact of new PM limit on Controls for HCl, Mercury and/or THC: None
- Other Aspects of the Reproposal ...list the aspect and the impact: None

Compliance Timeline: Provide detail on each activity and provide the start and stop dates for each activity.

Activity	Month and Year Each Activity Starts	Month and Year Each Activity Is Finished	Description of Task or Tasks Being Completed Under Each Activity
Review the structure integrity of the existing ESP	10-1-12	1-1-13	Engage a third party to investigate the structural integrity of the ESP to ensure it can be re-used • Need to be performed during a scheduled plant outage
Obtain proposals on work required to upgrade existing ESP	1-1-13	3-1-13	Obtain vendor requirements to upgrade the existing ESP
Re-locate the new stack adjacent to the existing ESP	1-1-13	2-1-13	Contract to a third party the layout work for a new stack
Prepare permit application for new stack and upgrade to ESP	2-1-13	4-1-13	Contract to a third party to prepare permit applications for the new stack and the upgrades to ESP

Cement NESHAP Compliance Timeline

Kiln: N

Current Compliance Status (Relative to the Reproposal; Where Appropriate, Differentiate Among Stacks)

- Particulate: Kiln - Existing ESP does not comply with the 2010 NESHAP Regulation continuously; Clinker Cooler Vent – Existing Jet Pulse Dust Collector has met the 2010 NESHAP limit as shown by three one-hour stack testing, but for long term continuous compliance needs upgrades.
- HCl: Comply with 3ppm limit.
- Mercury: Comply with 55 lb Hg per million st clinker limit.
- THC/organic HAP: Comply with 24 ppm limit

Likely Compliance Methods (Relative to the Reproposal; Where Appropriate, Differentiate Among Stacks)

- Particulate: Kiln - Existing ESP could comply with the reproposed NESHAP Regulation continuously, if upgrades where made to the ESP such as new transformers, wires and plates. The existing stack is used by two Kilns – Kiln #1 & #2. The single stack would be replaced with a stack for each kiln. Clinker Cooler Vent – Existing Jet Pulse Dust could comply with the reproposed NESHAP Regulation, but for long term compliance needs upgrades.
- HCl: None Required
- Mercury: None Required
- THC/organic HAP: None Required

How the Reproposal has Changed the Likely Compliance Strategy (Relative to the Reproposal; Where Appropriate, Differentiate Among Stacks)

- Impact of new PM limit on Particulate Controls: Originally, the kiln dust collector (ESP) would have been replaced with a new dust collector at a different location. A new stack was planned to correspond to the new dust collector location. If the existing ESP can be maintained and upgraded, the placement of the stack will change. Therefore engineering has to be done on the stack location, engineering review on the efficiency of upgrading the existing ESP and the structural condition of the ESP.
- Impact of new PM limit on Controls for HCl, Mercury and/or THC: None
- Other Aspects of the Reproposal ...list the aspect and the impact: None

Compliance Timeline: Provide detail on each activity and provide the start and stop dates for each activity.

Activity	Month and Year Each Activity Starts	Month and Year Each Activity Is Finished	Description of Task or Tasks Being Completed Under Each Activity
Review the structure integrity of the existing ESP	10-1-12	1-1-13	Engage a third party to investigate the structural integrity of the ESP to ensure it can be re-used • Need to be performed during a scheduled plant outage
Obtain proposals on work required to upgrade existing ESP	1-1-13	3-1-13	Obtain vendor requirements to upgrade the existing ESP
Re-locate the new stack adjacent to the existing ESP	1-1-13	2-1-13	Contract to a third party the layout work for a new stack

Cement NESHAP Compliance Timeline

Kiln: O

Current Compliance Status (Relative to the Reproposal; Where Appropriate, Differentiate Among Stacks)

- Particulate: Kiln - Existing ESP does not comply with the 2010 NESHAP Regulation continuously; Clinker Cooler Vent – Existing Jet Pulse Dust Collector has met the 2010 NESHAP limit as shown by three one-hour stack testing, but for long term continuous compliance needs upgrades.
- HCl: Comply with 3ppm limit.
- Mercury: Comply with 55 lb Hg per million st clinker limit.
- THC/organic HAP: Comply with 24 ppm limit

Likely Compliance Methods (Relative to the Reproposal; Where Appropriate, Differentiate Among Stacks)

- Particulate: Kiln - Existing ESP could comply with the reproposed NESHAP Regulation continuously, if upgrades where made to the ESP such as new transformers, wires and plates. Clinker Cooler Vent – Existing Jet Pulse Dust could comply with the reproposed NESHAP Regulation, but for long term compliance needs upgrades.
- HCl: None Required
- Mercury: None Required
- THC/organic HAP: None Required

How the Reproposal has Changed the Likely Compliance Strategy (Relative to the Reproposal; Where Appropriate, Differentiate Among Stacks)

Impact of new PM limit on Particulate Controls: Originally, the kiln dust collector (ESP) would have been replaced with a new dust collector or a polishing baghouse added in series with the existing ESP. Engineering needs to be performed to verify the effectiveness of upgrading the ESP and the condition of the ESP needs to be verified.

- Impact of new PM limit on Controls for HCl, Mercury and/or THC: None Required
- Other Aspects of the Reproposal ...list the aspect and the impact:
  - None Required

Compliance Timeline: Provide detail on each activity and provide the start and stop dates for each activity.

Activity	Month and Year Each Activity Starts	Month and Year Each Activity Is Finished	Description of Task or Tasks Being Completed Under Each Activity
Review the structure integrity of the existing ESP	10-1-12	1-1-13	Engage a third party to investigate the structural integrity of the ESP to ensure it can be re-used • Need to be performed during a scheduled plant outage
Obtain proposals on work required to upgrade existing ESP	1-1-13	3-1-13	Obtain vendor requirements to upgrade the existing ESP
Prepare permit application for upgrade to ESP	2-1-13	4-1-13	Contract to a third party to prepare permit applications for the upgrades to ESP
Submit Permit Applications	5-1-13	5-1-13	Submit permit application to the state air agency
Regulatory Agency Review of Application	5-1-13	12-1-13	

Cement NESHAP Compliance Timeline

Kiln: P

Current Compliance Status (Relative to the Reproposal; Where Appropriate, Differentiate Among Stacks)

- Particulate: Kiln - Existing ESP does not comply with the 2010 NESHAP Regulation continuously;
- HCl: Comply with 3ppm limit.
- Mercury: Comply with 55 lb Hg per million st clinker limit.
- THC/organic HAP: Comply with 24 ppm limit

Likely Compliance Methods (Relative to the Reproposal; Where Appropriate, Differentiate Among Stacks)

- Particulate: Kiln - Existing ESP could comply with the reproposed NESHAP Regulation continuously, if upgrades where made to the ESP such as new transformers, wires and plates.
- HCl: None Required
- Mercury: None Required
- THC/organic HAP: None Required

How the Reproposal has Changed the Likely Compliance Strategy (Relative to the Reproposal; Where Appropriate, Differentiate Among Stacks)

- Impact of new PM limit on Particulate Controls: Originally, the kiln dust collector (ESP) would have been replaced with a new dust collector or a polishing baghouse added in series with the existing ESP. Engineering needs to be performed to verify the effectiveness of upgrading the ESP and the condition of the ESP needs to be verified.
- Impact of new PM limit on Controls for HCl, Mercury and/or THC: None Required
- Other Aspects of the Reproposal ...list the aspect and the impact: None Required

Compliance Timeline: Provide detail on each activity and provide the start and stop dates for each activity.

Activity	Month and Year Each Activity Starts	Month and Year Each Activity Is Finished	Description of Task or Tasks Being Completed Under Each Activity
Review the structure integrity of the existing ESP	10-1-12	1-1-13	Engage a third party to investigate the structural integrity of the ESP to ensure it can be re-used • Need to be performed during a scheduled plant outage
Obtain proposals on work required to upgrade existing ESP	1-1-13	3-1-13	Obtain vendor requirements to upgrade the existing ESP
Prepare permit application for upgrade to ESP	2-1-13	4-1-13	Contract to a third party to prepare permit applications for the upgrades to ESP
Submit Permit Applications	5-1-13	5-1-13	Submit permit application to state air agency
Regulatory Agency Review of Application	5-1-13	12-1-13	
Receive Permit to Construct from Regulatory Agency	1-1-14	1-1-14	

Cement NESHAP Compliance Timeline

Kiln: Q

Current Compliance Status (Relative to the Reproposal; Where Appropriate, Differentiate Among Stacks)

- Particulate: Kiln - Existing ESP does not comply with the 2010 NESHAP Regulation continuously; Clinker Cooler Vent – Existing Jet Pulse Dust Collector has met the 2010 NESHAP limit as shown by three one-hour stack testing, but for long term continuous compliance needs upgrades.
- HCl: Comply with 3ppm limit.
- Mercury: Does not comply with 55 lb Hg per million st clinker limit.
- THC/organic HAP: Comply with 24 ppm limit

Likely Compliance Methods (Relative to the Reproposal; Where Appropriate, Differentiate Among Stacks)

- Particulate: Kiln - Existing ESP could comply with the reproposed NESHAP Regulation continuously, if upgrades where made to the ESP such as new transformers, wires and plates. The existing dual kiln stacks need replacement due to condition. The dual stacks would be replaced with a single stack. Clinker Cooler Vent – Existing Jet Pulse Dust could comply with the reproposed NESHAP Regulation, but for long term compliance needs upgrades.
- HCl: None Required
- Mercury: Kiln Dust Collector dust partial remove to finish mills plus ACI as required.
- THC/organic HAP: None Required

How the Reproposal has Changed the Likely Compliance Strategy (Relative to the Reproposal; Where Appropriate, Differentiate Among Stacks)

- Impact of new PM limit on Particulate Controls: Originally, the kiln dust collector (ESP) would have been replaced with a new dust collector at a different location. A new stack was planned to correspond to the new dust collector location. If the existing ESP can be maintained and upgraded, the placement of the stack will change. Therefore engineering has to be done on the stack location, engineering review on the efficiency of upgrading the existing ESP and the structural condition of the ESP.
- Impact of new PM limit on Controls for HCl, Mercury and/or THC: If the existing ESP can be maintained, the ESP is efficient at separating dust. Less dust will need to be transported to the finish mills in order to control the mercury emissions. The dust conveying system will be changed in sized and based on reusing the ESP, dust conveying layout will be reconfigured.
- Other Aspects of the Reproposal ...list the aspect and the impact:
    - The sizing of the ACI system will be impacted, since mercury reduction using an ESP will be less effective. Therefore a larger ACI system may need to be installed.

Compliance Timeline: Provide detail on each activity and provide the start and stop dates for each activity.

Activity	Month and Year Each Activity Starts	Month and Year Each Activity Is Finished	Description of Task or Tasks Being Completed Under Each Activity
Review the structure integrity of the existing ESP	10-1-12	1-1-13	Engage a third party to investigate the structural integrity of the ESP to ensure it can be re-used • Need to be performed during a schedule plant outage
Obtain proposals on work required to upgrade existing ESP	1-1-13	3-1-13	Obtain vendor requirements to upgrade the existing ESP
Re-locate the new stack adjacent to the existing ESP	1-1-13	2-1-13	Contract to a third party the layout work for a new stack

Cement NESHAP Compliance Timeline

Kiln: S

Current Compliance Status (Relative to the Reproposal; Where Appropriate, Differentiate Among Stacks)

- Particulate:
  Kiln Stack - Marginal, Cooler Stack – Compliant, Coal Mill Stack - Compliant
- HCl:
  Kiln Stack – Not Compliant, Cooler Stack – N/A, Coal Mill Stack – N/A
- Mercury:
  Kiln Stack – Not Compliant, Cooler Stack – N/A, Coal Mill Stack – N/A
- THC/organic HAP:
  Kiln Stack – Compliant, Cooler Stack – N/A, Coal Mill Stack – N/A

Likely Compliance Methods (Relative to the Reproposal; Where Appropriate, Differentiate Among Stacks)

- Particulate:
  Kiln Stack - Increased Bag Replacement Frequency, Additional/Retrofit Baghouse
- HCl:
  Kiln Stack - Raw Material Substitution, Operational Controls, Wet/Dry Scrubber
- Mercury:
  Kiln Stack - Raw Material Substitution, Operational Controls, Wet/Dry Scrubber
- THC/organic HAP:
  Kiln Stack - None

How the Reproposal has Changed the Likely Compliance Strategy (Relative to the Reproposal; Where Appropriate, Differentiate Among Stacks)

- Impact of new PM limit on Particulate Controls: Kiln Stack - The increase in the PM limit will significantly improve the likelihood that compliance can occur with fewer modifications to the baghouse and without the addition of control devices for PM
- Impact of new PM limit on Controls for HCl, Mercury and/or THC: Kiln Stack - No Change
- Other Aspects of the Reproposal ...list the aspect and the impact:
  - PM, Mercury, & HCl CEM Installation & Operation creates significant QAQC concerns related to budget, personnel, training, daily calibrations, quarterly audits, annual RATA, etc. Additional space is needed to fit the new CEM devices both on the stack and in the electrical rooms. Some concern about stack integrity due to additional port holes on stack.
  - Data on HCl emissions are very limited and there will have to be a significant amount of testing or monitoring to determine compliance status. Available data suggests that the facility is not in compliance with the new standards. There is not enough material or process testing data to determine if raw material substitution or operational controls can control HCl emissions sufficiently. It is possible that a wet/dry scrubber will be needed to control HCl.
  - Need more information to determine the best control technology for the facility (i.e. wet or dry scrubber) for HCl and/or mercury control.
  - Due to economic conditions the facility has been operating only about half of the year. If it is deemed that scrubbers, baghouse retrofits or modifications, or other significant equipment modifications are necessary to operate in compliance; it is very likely that this could result in a significant financial hardship, and if there isn't evidence of future market improvement it could result in closure of SAC due to the additional capital costs and increased operating costs. However, the reduced operating time should make it easier to schedule any necessary retrofits, modifications, or installations to ensure compliance; but this also reduces the amount of operating time available for testing and monitoring to determine the appropriate response for emission control.

Note: The compliance timeline provided below is subject to change based on results of testing and engineering studies.

Compliance Timeline: Provide detail on each activity and provide the start and stop dates for each activity.

Activity	Month and Year Each Activity Starts	Month and Year Each Activity Is Finished	Description of Task or Tasks Being Completed Under Each Activity

Exhibit G

April 9, 2012

The Impact of a Change in the Cement NESHAP PM Limit On Compliance Strategies and Schedules

EPA has asked the Portland Cement Association to provide its perspective on the impact that a change in the particulate matter (PM) limit[1] under the cement NESHAP rule will have on the selection and implementation of optimal control strategies to bring cement plants into compliance.

PCA has examined the available data on PM emissions and the variability of PM emissions for the best performing cement plants and believes that the correct PM limit will be in the range of 0.06 to 0.08 lbs/ton of clinker or higher, versus the current limit of 0.04 lbs/ton of clinker[2]. Further, in discussions with EPA, PCA has received no information to the contrary.

This paper addresses three impacts that such a change in the PM limit will have:

- The impact on the selection and implementation of the most appropriate control strategy for PM;
- The indirect effect on the selection of the most appropriate control strategy for HCl, mercury and THC under this rule; and
- The time needed to determine and implement the appropriate control strategies, once a revised PM limit is established.

We are also providing the results of a recent survey of PCA members addressing these same topics.

This paper and the results of the survey indicate that a return of the NESHAP PM limit for existing cement facilities to a figure closer to the one in the proposed rule will have a significant impact on the controls selected to conform with the PM limit as well as the controls used to meet the limits for HCl, mercury and THC, even if those limits remained unchanged.

Anticipated Changes to PM Control Strategies

The current PM limit of 0.04 lbs/ton of clinker is very stringent. This standard may be met only by using the most restrictive design of a baghouse with advanced instrumentation and controls, sophisticated filter media (PTFE membrane bags with sealed seams), and very challenging maintenance practices. Compliance with this limit is made more difficult by the fact that certain control systems that are being contemplated to meet the limits for HCl, mercury, and THC will add particulate loading to the exhaust of the unit.

While a number of cement plants already have baghouses, very few facilities can comply with the 0.04 lbs/ton clinker limit without major investments in new and upgraded PM controls[3]. A

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[1] This PM limit applies to the kiln exhaust, the clinker cooler exhaust and any by-pass stacks. Compliance is based on a 30 day rolling average determined using a PM Continuous Emissions Monitoring System (CEMS).

[2] It is should noted that a limit of 0.085 lb/ton of clinker, based on stack testing rather than CEMS, is what was in the proposed rule (May 6, 2009, 74 Fed. Reg, 21136).

[3] EPA's assessment of the technical and cost impact of the rule is consistent with this perspective. See Attachment A for a summary of EPA's earlier conclusions.

corrected NESHAP PM limit (on the order of 0.06 to 0.08 lbs/ton clinker) will result in a number of changes to the control strategy adopted for PM.

The PM sources addressed under this regulation are currently controlled with either an Electrostatic Precipitator (ESP) or a Baghouse.[4] Sources controlled with ESPs cannot achieve the 0.04 lbs/ton clinker limit. To meet the limit, an existing ESP would need to be: (1) replaced with a baghouse, (2) converted to a baghouse, (3) modified to a hybrid design (where the back end of the ESP is converted to a baghouse configuration), or (4) supplemented with a polishing baghouse.

Alkali control is an important consideration for many cement plants. In plants with ESPs, this is accomplished by segregating the dust in the different fields of the ESP and removing the high alkali fraction. Changing the PM standard, which may change the control technology chosen, may also require a re-engineering of the alkali control strategy.

The optimal strategy to meet the corrected limit (of 0.06 to 0.08 lbs/ton clinker) for units currently controlled with ESPs will change or at a minimum will require in-depth engineering studies to evaluate available options. It is anticipated that:

- Many ESPs can be retained with modifications (retrofitting with a hybrid system or a polishing baghouse),rather than being removed and replaced with a baghouse, and
- Even if the ESP is being replaced with a baghouse, the specifications for the baghouse will change.

Baghouses are generally considered to be the most effective PM control devices for many types of sources, including cement plants. The 0.04 lb/ton of clinker PM limit is so strict that a large number of sources with relatively new baghouses cannot meet the limit. A baghouse designed to meet the corrected limit of 0.06 -0.08 lb/ton clinker, versus 0.04 lb/ton clinker, will not be the same. A baghouse designed to meet the corrected limit will have a higher air to cloth ratio, and lower energy consumption. This also translates to a smaller size and smaller footprint. It can also mean the use of more conventional filter materials.

For those sources currently controlled with baghouses that cannot meet 0.04 lb/ton clinker, the options to meet the limit will be to replace the baghouse, increase the size of the baghouse, add a second polishing baghouse, upgrade the filter materials and advanced instrumentation and controls. If the applicable limit is corrected, a number of changes in the compliance strategy are available, including:

- Some baghouses that were going to be replaced can be instead upgraded.
- Others that were to be replaced can be replaced with a smaller baghouses

Cement plants run on induced draft. Changing the PM control device strategy (ESP to baghouse, ESP to hybrid, baghouse to bigger baghouse) will change the pressure drop over the system. A higher pressure drop with the same fan results in decreased flow. The required new fan design must be carefully matched to the final PM control device in order to maintain the correct flow.

With a change in PM limit, another option that will now be considered, instead of replacing or modifying the existing PM control device, is adding cyclones upstream of the existing ESP or

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[4] One member company has indicated that they have at least one affected source that is currently controlled with a gravel-bed filter.

baghouse. This requires engineering of the ductwork, layout, and any associated local permitting.

It is clear that a move from a limit of 0.04 to one in the range of 0.06-0.08 will have a significant impact on the selection of PM controls. When the approach for addressing HCl, mercury and THC compliance is considered, the implications are even greater.

Anticipated Changes to Control Strategies for HCl, Mercury and THC

The NESHAP for cement plants includes new limits for HCl, mercury and THC emissions that are scheduled to go into effect at the same time as the PM limit. As indicated in Attachment A, all of the control systems for these three pollutants (with the possible exception of a thermal oxidizer to control THC) increase the particulate loading in the exhaust. Therefore, the control strategy for these three components of the exhaust must be accounted for when determining the optimal strategy for simultaneous compliance with the NESHAP PM limit.

The following control measures for all three pollutants require either the collection of additional particulate that is injected into the exhaust of the unit or consideration of the indirect impact on the nature and level of PM needing control:

- When dry lime injection is used to reduce HCl emissions, the lime dust increases PM emissions unless the PM controls downstream of the injection point are designed to accommodate the increased dust load.
- Wet scrubbers, to control either HCl or mercury or both, can remove some particulate but they also create entrained droplets of scrubbing solution that form dry particulate as they dry in the exhaust. Although a wet scrubber would come after the main PM control, the evaluation of the wet scrubber contribution to the final PM emissions must be accounted for in the evaluation of the PM compliance strategy.
- Activated carbon injection is the leading add-on control measure for mercury and under consideration for THC emissions. The carbon must be removed from the exhaust downstream of the injection point. A polishing baghouse downstream of the primary PM control device is likely to be used, so as to isolate the carbon from the rest of the dust.

Because these control strategies for HCl, mercury and THC rely on the injection and removal of added particulates, a change in the PM limit can cause a change in the strategy for one or more of these pollutants. Further, compliance with all four standards (for PM, HCl, mercury and THC) must be coordinated for several reasons:

- One cannot design these injection systems without knowing the ultimate PM limit.
- The use of these injection strategies requires an upgrade in PM control both to avoid a PM increase and properly manage the additional particulate materials.
- The retrofitting of controls in plants with limited space means that the fans, ductwork and controls will need to located and sized carefully in a coordinated manner.
- These controls require changes to current air permits and state agencies will want to permit the integrated NESHAP compliance strategy rather than doing so piecemeal.

If EPA corrects the PM limit but only extends the compliance deadline for the PM limit, companies will still need to upgrade or replace PM controls in conjunction with integrated HCl, mercury and THC control systems. Optimal design and installation of these systems cannot be separated.

A change in the PM limit can also change the basic approach to HCl, Mercury and THC:

- A wet scrubber to remove HCl and/or mercury may be more or less attractive than lime and/or carbon injection, if the current PM control systems can be retained relative to the final PM limit.
- ESPs convert some of the elemental mercury in the exhaust to an oxidized form that can be removed as particulate. If an ESP can be retained with a downstream polishing baghouse, some additional mercury removal may occur.
- If an ESP can be converted to a hybrid design and meet the PM limit, it will be possible to inject and collect carbon in the hybrid portion of the ESP rather than adding a standalone polishing baghouse.

Compliance Timing

Assuming that the PM limit is changed, the time it will take to come into compliance will also change. For most cement plants, the installation of new emission controls will have to coincide with an extended outage during the low production season (i.e., Jan-Feb). Fabrication and electrical/mechanical/civil work will be started ahead of this, but the final installation can easily require 3 to 6 weeks of outage. To meet the current September 2013 deadline, final installation of all control systems must occur in the winter of 2012-13, with commissioning, CEMS implementation, and demonstration of compliance taking until September, 2013.

Assuming that a new PM standard is finalized in December of 2012, it will be necessary to conduct and/or commission new engineering studies to determine what options are available and their cost-effectiveness, which will take a minimum of 2-3 months.

If the result is that the facility will not change their control strategy (e.g., still intend to install a new bag filter) but adjustments to the baghouse design specification are needed, the facility will go through a new procurement process to assure competitive pricing of the new design. This would add a minimum of 6 months, which means that final installation could not take place until Jan./Feb. 2014, with commissioning, CEMS implementation, and demonstration of compliance taking until at least September of 2014.

If the new standard justifies a different technology (for example, a hybrid ESP/bag filter instead of a new baghouse filter), it will be necessary to:

- Conduct a new engineering study, including evaluation of the technical impacts to other pollution control devices and on the process.
- Go through a new selection process for qualified suppliers.
- Go through new bidding/procurement process to select the most cost effective vendor/contractor.
- Develop detailed engineering drawings.

All of the above takes 12-18 months, which means that final installation could not take place until Jan./Feb. of 2015, with commissioning, CEMS implementation, and demonstration of compliance taking until September of 2015.

The new and modified control systems will also be subject to air permitting, which could take up to 12 months or more and, with some agencies, cannot be completed until final designs are available.

Air permitting may be complicated if the pollution control devices or related process changes create a new emission point or changes (e.g., flow or temperature) to an existing emission point that must be accounted for in previously conducted air quality impact modeling.

If a wet scrubber is required, a new water discharge permit or permit amendment would be required. Building permits could also take several months after designs are completed.

When accounting for all of the above factors and the limited availability of /competition for vendors, consultants, suppliers and contractors, it will be very challenging to be ready for installation in early 2015 and ready for compliance at the end of 2015.

Survey of PCA Members

PCA recently completed a survey of its member regarding the potential impact of this magnitude of change in the PM limit under NESHAP on the optimal strategy for bringing their kilns, clinker coolers and by-pass stacks into compliance with all of the NESHAP limits. The results are summarized in Attachment B.

PCA received survey responses from 18 companies, representing 92 kilns. Of those kilns, 21 presently have ESPs, 70 have baghouses and one has both. The survey also addressed compliance for 75 by-pass and clinker cooler stacks.

Of the kilns, clinker coolers and alkali by-pass stacks, the operators of **62%** of those with ESPs report that they will need to reconsider and revamp their PM strategy if the limit is corrected. The most common reason given is that they believe that they can keep an existing ESP with an upgrade rather than removing it and replacing it with a new baghouse.[5]

For the affected sources currently controlled with baghouses, the operators of **43%** of those baghouses report that they will revamp their PM strategy. The most common reason given is that they feel that they can keep the current baghouse and upgrade it rather than replace it, or they were planning for an upgrade of the existing baghouse and the scope of the upgrade will change.

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Respondent were also asked if the interaction of the PM limit with their compliance strategy for the other three pollutants would cause them to consider changing the compliance method for the other pollutants. The respondents indicated that a change in the PM standard would cause them to review and revise their control methods for HCl at 25% of the kilns, for mercury at 14% of the kilns and for THC at 5% of the kilns.

Lastly, respondents were asked if a deferral of the PM limit would interfere with meeting the other three limits in advance of the PM limit. Respondents identified 40 instances where there will be a problem with trying to comply with the limits for HCl, THC and mercury in advance of having the time needed to meet the PM limit. The problems included the need to upgrade PM controls to handle the increased dust loading associated with measures for HCl, mercury or THC, and the inability to install ductwork and fans without including the PM control changes associated with the final PM limit.

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[5] It should be noted that a number of the respondents who indicated a change strategy would not be warranted by a change in the PM limit stated it was only because they had already made irreversible commitments to controls, some of which are in the context of consent orders with EPA.

Attachment A EPA Information on the Technical Implications of the NESHAP PM Limit

This PCA paper outlines the ways in which a different PM limit will affect the selection of controls for PM, HCl, mercury and THC. EPA's own analyses in support of the NESHAP rule are consistent with this assessment. EPA's "Summary of Environmental and Cost Impacts of Final Amendments to Portland Cement NESHAP" states:

- Because of emissions variability, a unit needing to comply with 0.04 lbs/ton clinker via CEMS must be designed to meet 0.02 lbs/ton clinker in a stack test. (New data shows that the variability is even greater and suggests a still larger margin is needed.)
- EPA notes that a number of existing baghouses cannot meet the 0.04 lbs/ton clinker standard. EPA identifies the use of membrane bags as a possible solution. EPA estimates the cost of retrofitting membrane bags at over $1 million per baghouse.
- Further, EPA notes that the compliance strategy for all four pollutants involves changes to the PM controls. Here is an excerpt from a table in that report where the expected controls are listed:

Regulated HAP and Appropriate Add-On Control Devices HAP	**Control Device**
Mercury	Wet scrubber ACI w/polishing baghouse
THC /Organic HAP	ACI w/polishing baghouse RTO (preceded by wet scrubber)
HCl	Wet scrubber Lime Injection
PM	Baghouse

(Note that lime injection is also dependent on dust removal downstream of the lime injection.)

Attachment B: Survey Results Summary

NESHAP PM Control Strategy Implications of a Relaxation in the PM Limit	Kilns with ESPs	Clinker Cooler and By-pass Stacks with ESPs	Kilns with Baghouses[6]	Clinker Coolers and By-pass Stacks with Baghouses
• No Change in PM Compliance Strategy Contemplated	7	4	38	41
• Keeping Current PM Control System, With Modification, Instead of Replacement Now Contemplated	9	3	9	5
• Changing Design of Anticipated Upgrade or Avoiding Upgrade Now Contemplated	2	0	21	18
• Changing Design of Replacement Now Contemplated	3	1	3	3
Total[7]	21	8	71	67

NESHAP Control Strategy Implications of a Relaxation of the PM Limit	Number of Kilns	Number of Clinker Cooler and By-pass Stacks
Changes for HCl:		
• Choice of Sorbent/ Scrubber System	2	1
• Change to Type, Rate or Configuration of Sorbent Injection	11	1
• Change to Downstream Systems	10	0
Total	23	2
Changes For Mercury:		
• Change to Design of Sorbent Injection and Collection System	10	1
• Retained ESP Impacts Oxidized Mercury Control	3	0
Total	13	1
Changes For THC:		
• Change to Design of Sorbent Injection and Collection System	2	0
• Change to the Selection of a Control Method	3	3
Total	5	3

Impediments to Early Compliance with HCl, THC and Mercury Limits if PM Limit Compliance Deadline is Deferred	
• PM Upgraded Needed To Handle Sorbent Loading	17
• Changes Cannot be Permitted without PM Upgrade at the Same Time	5
• Layout of Controls, Fans and Ductwork Affected by Necessary PM Control System Design	18

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[6] Includes one kiln equipped with both an ESP and a baghouse.

[7] Total reflects the 92 kilns that were surveyed, including 21 with equipped with ESPs and 71 equipped with baghouses.

Exhibit H

SUMMARY OF ENVIRONMENTAL AND COST IMPACTS FOR FINAL PORTLAND CEMENT NESHAP AND NSPS

AUGUST 6, 2010

Summary of Environmental and Cost Impacts of Final Amendments to Portland Cement NESHAP (40 CFR Part 63, subpart LLL)

Docket Number EPA-HQ-OAR-2002-0051

August 6, 2010

For a new 1.2 million tpy kiln with HCl emissions at a concentration of 12 ppmvd, baseline HCl emissions would be 68 tpy. Baseline emissions for 16 new kilns would be an estimated 1,100 tpy.

To estimate the reduction in emissions of HCl under the final standards, the number of kilns that would add controls was estimated. It is estimated that 29 of the existing kilns will not be subject to the final standards for HCl because they are identified in the EPA's National Emissions Inventory (NEI) as area sources. For these kilns, there would be no environmental or cost impacts as a result of the final standards for HCl. An estimated 118 existing kilns would require scrubbers to meet the proposed HCl standards and 4 could meet the standard using dry lime injection. Wet scrubbers are estimated to reduce HCl emissions by 99.9 percent. Dry lime injection is estimated to reduce HCl emissions by 75 percent. Total nationwide emission reductions from existing kilns were estimated to be 4,800 tpy. For a new 1.2 million tpy kiln, emission reductions were estimated at 68 tpy; by 2013, total emission reductions from all new kilns would total about 1,100 tpy. Total nationwide baseline emissions and emission reductions for HCl are summarized in Exhibit 5.

Exhibit 5 Nationwide Baseline Emissions and Emission Reductions

HAP	Existing or new kilns	Baseline emissions	Emission reductions
HCl	Existing	4,907 tpy	4,755 tpy
	New	1,110 tpy	1,101 tpy
THC	Existing	12,165 tpy	6,453 tpy
	New	793 tpy	397 tpy
Organic HAP	Existing	4,364 tpy	3,433 tpy
	New	433 tpy	346 tpy
Mercury	Existing	15,942 lb/yr	14,703 lb/yr
	New	2,096 lb/yr	1,886 lb/yr
PM	Existing	10,326tpy	9,489 tpy
	New	2,165 tpy	1,990 tpy

As a co-benefit of controlling HCl using wet scrubbers, emission of SO_2 will also be reduced. Wet scrubbers used for HCl control will reduce SO_2 emission by 95 percent; dry lime injection by 70 percent. Uncontrolled SO_2 emissions vary by kiln type and location and emission factors for SO2 are presented in Exhibit 6. Uncontrolled SO2 emission factors and scrubber and lime injection control efficiencies were used to estimate SO2 emission reductions resulting from the control of HCl. Total nationwide SO_2 reductions from existing kilns was estimated at 115,000 tpy. For a new 1.2 million tpy kiln equipped with a scrubber, SO_2 emissions reductions would be about 190 tpy or 18,000 tpy for 16 new kilns by 2013.

Exhibit 6 Uncontrolled SO_2 Emissions (lb/ ton clinker) by Kiln Type and State (Andover, 2009)

State	Precalciner	Preheater	Dry	Wet
AL	0.09	0.61		13.99
AZ	1.30	0.07	8.51	
AR	2.94		3.45	7.59

Exhibit I

August 2010

Regulatory Impact Analysis: Amendments to the National Emission Standards for Hazardous Air Pollutants and New Source Performance Standards (NSPS) for the Portland Cement Manufacturing Industry

Final Report

U.S. Environmental Protection Agency
Office of Air Quality Planning and Standards (OAQPS)
Air Benefit and Cost Group
(MD-C439-02)
Research Triangle Park, NC 27711

Table 2-10. Cement Manufacturing Employment (NAICS 327310): 2000 to 2005

Year	Number of Employees
2000	17,175
2001	17,220
2002	17,660
2003	17,352
2004	16,883
2005	16,877

Sources: U.S. Department of Commerce, Bureau of the Census. 2006. *2005 Annual Survey of Manufacture*s. M05(AS)-1. Washington, DC: Government Printing Office. Available at <http://www.census.gov/prod/2003pubs/m01as-1.pdf>. As obtained on March 14, 2008.

U.S. Department of Commerce, Bureau of the Census. 2003. *2001 Annual Survey of Manufacture*s. M05(AS)-1. Washington, DC: Government Printing Office. Available at <http://www.census.gov/prod/2003pubs/m01as-1.pdf>. As obtained on March 14, 2008.

2.3.3.1 Distribution of Small and Large Companies

Firms are grouped into small and large categories using Small Business Administration (SBA) general size standard definitions for NAICS codes. These size standards are presented either by number of employees or by annual receipt levels, depending on the NAICS code. The manufacture of Portland cement is covered by NAICS code 327310 for cement manufacturing. Thus, according to SBA size standards, firms owning Portland cement manufacturing plants are categorized as small if the total number of employees at the firm is less than 750; otherwise, the firm is classified as large. As shown in Table 2-11, potentially affected firms range in size from 160 to 71,000 employees. A total of 4 firms, or 15%, are categorized as small, while the remaining 23 firms, or 75%, are large.[1]

2.3.3.2 Capacity Share

As shown in Table 2-11, the leading companies in terms of capacity at the end of 2005 were Holcim (U.S.) Inc.; CEMEX, Inc.; Lafarge North America, Inc.; Buzzi Unicem USA, Inc.; HeidelbergCement AG (owner of Lehigh Cement Co.); Ash Grove Cement Co.; Texas Industries, Inc.; Italcementi S.p.A.; Taiheiyo Cement Corporation; Titan Cement; and VICAT. The top 5 had about 57% of total U.S. clinker capacity, and the top 10 accounted for 83% of total capacity. Small companies accounted for less than 5% of clinker capacity.

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[1] In cases where no employment data were available, we used information from previous EPA analyses to determine firm size.

Table 2-11. Ultimate Parent Company Summary Data: 2005

Ultimate Parent Name	Annual Sales ($\$10^6$)	Employment	Type	Small Business	Plants	Kilns	Clinker Capacity (10^3 metric tons per year)	Capacity Share
Holcim, Inc	$14,034	59,901	Public	No	14	17	13,089	14.0%
CEMEX, S.A. de C.V.	$18,290	26,679	Public	No	13	21	12,447	13.3%
Lafarge S.A.	$22,325	71,000	Public	No	13	23	12,281	13.1%
BUZZI UNICEM SpA	$3,495	11,815	Private	No	10	19	8,129	8.7%
HeidelbergCement AG	$12,182	45,958	Public	No	10	13	7,786	8.3%
Ash Grove Cement Company	$1,190	2,600	Private	No	9	15	6,687	7.1%
Texas Industries, Inc.	$944	2,680	Public	No	4	15	5,075	5.4%
Italcementi S.p.A.	$5,921	20,313	Public	No	6	16	4,442	4.7%
Taiheiyo Cement Corporation	$7,710	2,061	Private	No	3	7	3,375	3.6%
Titan Cement	$1,589	1,834	Public	No	2	2	2,612	2.8%
VICAT	$2,137	6,015	Public	No	2	2	1,933	2.1%
Eagle Materials	$922	1,600	Public	No	3	5	1,651	1.8%
Mitsubishi Cement Corporation	$1,134	NA	Joint venture	No	1	1	1,543	1.6%
Rinker Materials	$4,140	11,193	Private	No	2	2	1,533	1.6%
Hanson America Holdings	$3,000	14,872	Private	No	1	1	1,497	1.6%
Salt River Materials Group [a]	$150[b]	<750	Tribal Government	Yes	1	4	1,477	1.6%
Grupo Cementos de Chihuahua, S.A. de C.V.	$663	2,591	Public	No	2	5	1,283	1.4%
Cementos Portland Valderrivas, S.A.	$1,159	2,674	Public	No	2	6	1,257	1.3%
Zachary Construction	$152	1,200	Private	No	1	2	868	0.9%
RMC Pacific Materials	$160	800	Private	No	1	1	812	0.9%

(continued)

Table 2-11. Ultimate Parent Company Summary Data: 2005 (continued)

Ultimate Parent Name	Annual Sales ($\$10^6$)	Employ-ment	Type	Small Business	Plants	Kilns	Clinker Capacity (10^3 metric tons per year)	Capacity Share
Monarch Cement Company	$154	600	Public	Yes	1	2	787	0.8%
Florida Rock Industries	$1,368	3,464	Public	No	1	1	726	0.8%
Votorantim Group and Anderson Columbia Company	$9,518	30,572	Joint venture	No	1	1	682	0.7%
Dyckerhoff AG	$1,876	6,958	Public	No	1	1	586	0.6%
Continental Cement Company, LLC	$50[b]	<750	Private	Yes	1	1	549	0.6%
Cementos Del Norte	NA	NA	Private	No	1	1	392	0.4%
Snyder Associate Companies	$29	350	Private	Yes	1	2	286	0.3%

[a] Enterprise is owned by Salt River Pima-Maricopa Indian Community.

[b] EPA estimate.

Sources: Dun & Bradstreet, Inc. 2007. D&B million dollar directory. Bethlehem, PA.
LexisNexis. LexisNexis Academic [electronic resource]. Dayton, OH: LexisNexis.

2.3.3.3 Company Revenue and Ownership Type

Cement manufacturing is a capital-intensive industry. The vast majority of stakeholders are large global companies with sales exceeding $1 billion. In 2005, ultimate parent company sales ranged from $30 million to $22.3 billion (Table 2-11), with average (median) sales of $4,565 ($1,589) million. Small companies accounted for 0.3% share by sales. Ultimate parent companies were either privately or publicly owned or jointly operated by several companies. A majority of the companies (52%) were publicly owned. Private companies had a slightly smaller share (41%), and only two (or 7%) were joint ventures.

2.4 Markets

Portland cement is produced and consumed domestically as well as traded internationally. The United States meets a substantial fraction of its cement needs through imports; in contrast, it exports only a small fraction of domestically produced cement to other countries. We provide value, quantity, and price trends over the past decade for Portland cement when detailed statistics

4.3 Additional Market Analysis

In additional to the screening analysis, EPA also examined small entity effects after accounting for market adjustments. Under this assumption, the entities recover some of the regulatory program costs as the market price adjusts in response to higher cement production costs. Even after accounting for these adjustments, small entity operating profits fall by less than 1 million.

4.4 Assessment

After considering the economic impact of this final rule on small entities, EPA has determined it will not have a significant economic impact on the four small entities. No small companies have cost-to-sales ratios greater than 3% and only 4 of the over 40 cement companies are small entities.

Exhibit J

INDEX OF DECLARATIONS

Expert Declaration

Declaration of Ranajit Sahu

Membership Declarations

Declaration of Yolanda M. Andersen

Declaration of Deirdre Butler

Declaration of Richard Cargill

Declaration of Kathryn Tilson

Declaration of Jane Williams

Declaration of Brenda Bibee

Declaration of Rebecca Bornhorst

Declaration of Sue Pope

Declaration of Ann Sears

Declaration of Jennifer Swearingen

Declaration of Tim Crawford

DECLARATION OF RANAJIT SAHU

1. I am an engineer and an environmental consultant. I have over twenty one years of experience in the fields of environmental, mechanical, and chemical engineering including: program and project management services; design and specification of pollution control equipment; soils and groundwater remediation; combustion engineering evaluations; energy studies; multimedia environmental regulatory compliance (involving statutes and regulations such as the Federal CAA and its Amendments, Clean Water Act, TSCA, RCRA, CERCLA, SARA, OSHA, NEPA as well as various related state statutes); transportation air quality impact analysis; multimedia compliance audits; multimedia permitting (including air quality NSR/PSD permitting, Title V permitting, NPDES permitting for industrial and storm water discharges, RCRA permitting, etc.), multimedia/multi-pathway human health risk assessments for toxics; air dispersion modeling; and regulatory strategy development and support including negotiation of consent agreements and orders. Specifically, I have consulted for various clients with regards to Clean Air Act rulemakings by the EPA for over 10 years. A copy of my resume is provided at Attachment A to this Declaration.

2. I was asked by counsel to estimate emissions of filterable particulate matter (fPM), a type of air pollutant, from cement kilns and to compare them to the standards for this pollutant that EPA promulgated in 2010 and 2013. Typically, emissions of this pollutant are controlled by an air pollution control device called a baghouse or fabric filter. Another air pollution control device that can control fPM is called an electrostatic precipitator (ESP). Typically, baghouses can provide better control of fPM than ESPs. Thus, I was asked to estimate emissions of fPM after such controls, thereby representing emissions

that would be directed at the atmosphere. Specifically, I have conducted these calculations for three example cement kilns – the California Portland Cement (CPC) kiln located in Mojave, CA; the Cemex kiln located in Knoxville, TN; and the Cemex kiln located in Lyons, CO. For the CPC kiln, I conducted the calculations for two conditions, namely with the raw mill on and with the raw mill off. The results of the calculations are provided in spreadsheets provided in Attachment B to this Declaration.

3. In estimating the emissions of fPM, I am reporting all emissions in the units of pounds of fPM per ton of clinker produced, a common normalization of such emissions from kilns, that allows for emissions comparisons across different kilns. It is also the same normalization EPA uses in its 2010 and 2013 standards for existing cement kilns. Clinker is a product of the kiln or pyro processing system, which is subsequently converted to cement in later stages in a cement plant. Clinker is produced in the kiln when raw materials (mainly limestone, silica sand and various additives) are calcined. Typically, the ratio of raw feed mass to the kiln as compared to the clinker produced by the kiln is 1.65. While this ratio can vary from kiln to kiln and also from batch to batch within a kiln, it is a reasonable approximation of the relationship between raw feed and clinker masses. As such EPA has used this ratio in its calculations and rule makings. *See, e.g.*, 78 Fed. Reg. 10,006, 10,038/2 (Feb. 12, 2013) (codified at 40 C.F.R. § 63.1343(b)(2)) I too use this ratio, as needed, in some of my calculations.

4. For the CPC Mojave kiln as well as the Cemex Knoxville kiln, my calculations rely on source test or stack test measurements conducted by third-party stack testing companies hired by the companies. The results of the stack tests are available in reports submitted to respective regulatory agencies and online through EPA's WebFIRE website. Typically, a

test sequence involves three individual test runs. Citations for the specific tests and the data used are shown in Attachment B. In addition to computing the individual run fPM emission rates using the measured (lb/hr) emissions rates during a specific test run and the reported raw feed rate (which was converted to the clinker produced rate using the 1.65 factor discussed above) or the clinker rate directly reported during the test, Attachment B also shows the average fPM emission rate for each of these two kilns. In addition, Attachment B also shows a statistical emission rate called the 99 UPL or the 99th percentile Upper Prediction Limit, which, in simple terms, uses the variability observed in the emission rate (between the three runs for each kiln test sequence) in predicting what the 99th percentile of the average 3-run emission rate might be in a future 3-run test sequence. As such, the 99 UPL metric has been used by the EPA in its various rule-makings to set so-called "floor" emission levels that sources have to meet. In estimating the 99 UPL, I have used the exact same methodology (and the same spreadsheet, with the test results updated) that EPA used in its rule making for the cement industry. *See Final Portland Cement Reconsideration Technical Support Document* app.F (EPA-HQ-OAR-2011-0817-0845, Dec. 20, 2012), *available at* www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2011-0817-0845 (click on icon labeled "XLS") .

5. For the third kiln, namely Cemex at Lyons, I did not have stack test data. Instead, I used annual estimated average fPM (actually, PM_{10}, which includes all particles that are 10 microns in aerodynamic diameter, or smaller in size – which is what one would expect from the baghouse) emissions from this kiln in 2009, 2010, and 2011 along with production data (i.e., raw feed rate for these years, converted to clinker production rates,

using the same 1.65 factor discussed earlier). These data were reported to the Colorado regulators by the company. In this case, given that the data available was an annual average values for each of three years, I did not compute the 99 UPL value. Instead just the annual values and the average are shown for this kiln in Attachment B.

6. Based on the data and calculations shown in Attachment B, I calculate that the fPM emission rates (in lbs/ton clinker produced in all cases) for the CPC Mojave kiln during the raw mill on condition are as follows: 0.0619, 0.0645, and 0.1097 for the three test runs; an arithmetic average rate of 0.0787 and a 99 UPL value of 0.232. For this same kiln during the raw mill off condition I calculate that the fPM emission rates (in lbs/ton clinker produced in all cases) as follows: 0.1069, 0.1011, and 0.0824 for the three test runs; an arithmetic average rate of 0.0968 and a 99 UPL value of 0.170. All the arithmetic average and 99 UPL values exceed the 0.07 lb/ton clinker standard EPA established in 2013 for particulate matter, as well as the 0.04 lb/ton clinker standard EPA established in 2010 for particulate matter.
7. Based on the data and calculations shown in Attachment B, I calculate that the fPM emission rates (in lbs/ton clinker produced in all cases) for the Cemex Knoxville kiln are as follows: 0.1960, 0.1809, and 0.2007 for the three test runs; an arithmetic average rate of 0.1925 and a 99 UPL value of 0.251. The arithmetic average and 99 UPL values exceed the 0.07 lb/ton clinker standard EPA established in 2013 for particulate matter, as well as the 0.04 lb/ton clinker standard EPA established in 2010 for particulate matter.
8. Based on the data and calculations shown in Attachment B, I calculate that the fPM_{10} average annual emission rates (in lbs/ton clinker produced in all cases) for the Cemex Lyons kiln are as follows: 0.1847 for year 2009, 0.1983 for year 2010, and 0.2017 for

year 2011. The average emission rate for all three years is 0.1949. Each annual average and the combined arithmetic average values exceed the 0.07 lb/ton clinker standard EPA established in 2013 for particulate matter, as well as the 0.04 lb/ton clinker standard EPA established in 2010 for particulate matter.

9. Counsel also asked me to estimate emissions of mercury, another air pollutant, from the Cemex Lyons cement kiln's stack and to compare it to the standard EPA promulgated in 2010 and reaffirmed in 2013. In estimating the emissions, I am reporting the end result in the units of pounds of mercury per million tons of clinker produced, the same normalization EPA uses in its cement rule. I use the same 1.65 ratio of raw feed mass to clinker mass produced as discussed above. Again, as above, I did not have stack test data for the Cemex Lyons kiln. Instead, I used the mercury emissions the company reported to the Colorado regulators for the years 2009, 2010, and 2011. The results of the calculations are provided in spreadsheets provided in Attachment B to this Declaration.
10. Based on the data and calculations shown in Attachment B, I calculate that the mercury average annual emission rates (in lbs/million tons clinker produced in all cases) for the Cemex Lyons kiln are as follows: 105.4835 for year 2009, 177.6098 for year 2010, and 181.8203 for year 2011. The average emission rate for all three years is 154.9712. All these averages exceed the 55 lb/million tons clinker standard for mercury EPA established in 2010 and reaffirmed in 2013.
11. Counsel also asked me to review the results of Part 1 of EPA's Information Collection Request (EPA-HQ-OAR-2002-0051-3401, July 28, 2009). In that document, the list of cement plants that reported using an ESP, rather than a baghouse or fabric filter, to control fPM, or no fPM control at all includes: the Lafarge plant in Joppa, Massac

County, IL; the Lone Star plant in Oglesby, Lasalle County, IL; the Essroc plant in Speed, Clark County, IN; the Lehigh plant in Mitchell, Lawrence County, IN; the Ash Grove plant in Montana City, Jefferson County, MT; the Holcim plant in Trident, Gallatin County, MT; the Ash Grove plant in Louisville, Cass County, NE; the Lafarge plant in Ravena, Albany County, NY; the Holcim plant in Ada, Pontotoc County, OK; the Cemex plant in Wampum, Lawrence County, PA; and the TXI plant in Hunter, Comal County, TX.

12. I also reviewed at Counsel's request EPA's estimates of plants with fPM_{10} rates (in EPA-HQ-OAR-2002-0051-3480). In that document, EPA estimated that at least the following cement plants emitted fPM_{10} at one or more of their kilns at a rate that exceeded 0.07 lbs/ton clinker produced: the CalPortland plant in Rillito, Pima County, AZ; the Cemex plant in Brooksville, Hernando County, FL; the Cemex plant in Clinchfield, Houston County, GA; the Buzzi plant in Stockertown, Northampton, PA; the GCC plant in Rapid City, Pennington County, SD; and the Lehigh plant in Waco, McLennan County, TX.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this 16th day of April, 2013.

Ranajit Sahu

Ranajit Sahu

ATTACHMENT A

RANAJIT (RON) SAHU, Ph.D, QEP, CEM (Nevada)

CONSULTANT, ENVIRONMENTAL AND ENERGY ISSUES

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EXPERIENCE SUMMARY

Dr. Sahu has over twenty one years of experience in the fields of environmental, mechanical, and chemical engineering including: program and project management services; design and specification of pollution control equipment; soils and groundwater remediation; combustion engineering evaluations; energy studies; multimedia environmental regulatory compliance (involving statutes and regulations such as the Federal CAA and its Amendments, Clean Water Act, TSCA, RCRA, CERCLA, SARA, OSHA, NEPA as well as various related state statutes); transportation air quality impact analysis; multimedia compliance audits; multimedia permitting (including air quality NSR/PSD permitting, Title V permitting, NPDES permitting for industrial and storm water discharges, RCRA permitting, etc.), multimedia/multi-pathway human health risk assessments for toxics; air dispersion modeling; and regulatory strategy development and support including negotiation of consent agreements and orders.

He has over nineteen years of project management experience and has successfully managed and executed numerous projects in this time period. This includes basic and applied research projects, design projects, regulatory compliance projects, permitting projects, energy studies, risk assessment projects, and projects involving the communication of environmental data and information to the public. Notably, he has successfully managed a complex soils and groundwater remediation project with a value of over $140 million involving soils characterization, development and implementation of the remediation strategy, regulatory and public interactions and other challenges.

He has provided consulting services to numerous private sector, public sector and public interest group clients. His major clients over the past twenty one years include various steel mills, petroleum refineries, cement companies, aerospace companies, power generation facilities, lawn and garden equipment manufacturers, spa manufacturers, chemical distribution facilities, and various entities in the public sector including EPA, the US Dept. of Justice, California DTSC, various municipalities, etc.). Dr. Sahu has performed projects in over 44 states, numerous local jurisdictions and internationally.

Dr. Sahu's experience includes various projects in relation to industrial waste water as well as storm water pollution compliance include obtaining appropriate permits (such as point source NPDES permits) as well development of plans, assessment of remediation technologies, development of monitoring reports, and regulatory interactions. Over the years, he has provided consulting services relating to industrial wastewater pre-treatment options and permitting aspects to a range of clients [industrial, regulatory, public interest] for a range of industries including petroleum refineries, aerospace manufacturing, chemical distribution, brass foundry, electroplating operations, jewelry manufacturing, steel mills, and coal-fired power units.

In addition to consulting, Dr. Sahu has taught numerous courses in several Southern California universities including UCLA (air pollution), UC Riverside (air pollution, process hazard analysis), and Loyola Marymount University (air pollution, risk assessment, hazardous waste management) for the past seventeen years. In this time period he has also taught at Caltech, his alma mater (various engineering courses), at the University of Southern California (air pollution controls) and at California State University, Fullerton (transportation and air quality).

Dr. Sahu has and continues to provide expert witness services in a number of environmental areas discussed above in both state and Federal courts as well as before administrative bodies (please see Annex A).

EXPERIENCE RECORD

2000-present	**Independent Consultant.** Providing a variety of private sector (industrial companies, land development companies, law firms, etc.) public sector (such as the US Department of Justice) and public interest group clients with project management, air quality consulting, waste remediation and management consulting, as well as regulatory and engineering support consulting services.
1995-2000	Parsons ES, **Associate, Senior Project Manager and Department Manager for** Air Quality/Geosciences/Hazardous Waste Groups, Pasadena. Responsible for the management of a group of approximately 24 air quality and environmental professionals, 15 geoscience, and 10 hazardous waste professionals providing full-service consulting, project management, regulatory compliance and A/E design assistance in all areas.
	Parsons ES, **Manager for Air Source Testing Services**. Responsible for the management of 8 individuals in the area of air source testing and air regulatory permitting projects located in Bakersfield, California.
1992-1995	Engineering-Science, Inc. **Principal Engineer and Senior Project Manager** in the air quality department. Responsibilities included multimedia regulatory compliance and permitting (including hazardous and nuclear materials), air pollution engineering (emissions from stationary and mobile sources, control of criteria and air toxics, dispersion modeling, risk assessment, visibility analysis, odor analysis), supervisory functions and project management.
1990-1992	Engineering-Science, Inc. **Principal Engineer and Project Manager** in the air quality department. Responsibilities included permitting, tracking regulatory issues, technical analysis, and supervisory functions on numerous air, water, and hazardous waste projects. Responsibilities also include client and agency interfacing, project cost and schedule control, and reporting to internal and external upper management regarding project status.
1989-1990	Kinetics Technology International, Corp. **Development Engineer.** Involved in thermal engineering R&D and project work related to low-NOx ceramic radiant burners, fired heater NOx reduction, SCR design, and fired heater retrofitting.
1988-1989	Heat Transfer Research, Inc. **Research Engineer**. Involved in the design of fired heaters, heat exchangers, air coolers, and other non-fired equipment. Also did research in the area of heat exchanger tube vibrations.

EDUCATION

1984-1988	Ph.D., Mechanical Engineering, California Institute of Technology (Caltech), Pasadena, CA.
1984	M. S., Mechanical Engineering, Caltech, Pasadena, CA.
1978-1983	B. Tech (Honors), Mechanical Engineering, Indian Institute of Technology (IIT) Kharagpur, India

TEACHING EXPERIENCE

Caltech

"Thermodynamics," Teaching Assistant, California Institute of Technology, 1983, 1987.

"Air Pollution Control," Teaching Assistant, California Institute of Technology, 1985.

"Caltech Secondary and High School Saturday Program," - taught various mathematics (algebra through calculus) and science (physics and chemistry) courses to high school students, 1983-1989.

"Heat Transfer," - taught this course in the Fall and Winter terms of 1994-1995 in the Division of Engineering and Applied Science.

“Thermodynamics and Heat Transfer,” Fall and Winter Terms of 1996-1997.

U.C. Riverside, Extension

"Toxic and Hazardous Air Contaminants," University of California Extension Program, Riverside, California. Various years since 1992.

"Prevention and Management of Accidental Air Emissions," University of California Extension Program, Riverside, California. Various years since 1992.

"Air Pollution Control Systems and Strategies," University of California Extension Program, Riverside, California, Summer 1992-93, Summer 1993-1994.

"Air Pollution Calculations," University of California Extension Program, Riverside, California, Fall 1993-94, Winter 1993-94, Fall 1994-95.

"Process Safety Management," University of California Extension Program, Riverside, California. Various years since 1992-2010.

"Process Safety Management," University of California Extension Program, Riverside, California, at SCAQMD, Spring 1993-94.

"Advanced Hazard Analysis - A Special Course for LEPCs," University of California Extension Program, Riverside, California, taught at San Diego, California, Spring 1993-1994.

“Advanced Hazardous Waste Management” University of California Extension Program, Riverside, California. 2005.

Loyola Marymount University

"Fundamentals of Air Pollution - Regulations, Controls and Engineering," Loyola Marymount University, Dept. of Civil Engineering. Various years since 1993.

"Air Pollution Control," Loyola Marymount University, Dept. of Civil Engineering, Fall 1994.

“Environmental Risk Assessment,” Loyola Marymount University, Dept. of Civil Engineering. Various years since 1998.

“Hazardous Waste Remediation” Loyola Marymount University, Dept. of Civil Engineering. Various years since 2006.

University of Southern California

"Air Pollution Controls," University of Southern California, Dept. of Civil Engineering, Fall 1993, Fall 1994.

"Air Pollution Fundamentals," University of Southern California, Dept. of Civil Engineering, Winter 1994.

University of California, Los Angeles

"Air Pollution Fundamentals," University of California, Los Angeles, Dept. of Civil and Environmental Engineering, Spring 1994, Spring 1999, Spring 2000, Spring 2003, Spring 2006, Spring 2007, Spring 2008, Spring 2009.

International Programs

“Environmental Planning and Management,” 5 week program for visiting Chinese delegation, 1994.

“Environmental Planning and Management,” 1 day program for visiting Russian delegation, 1995.

“Air Pollution Planning and Management,” IEP, UCR, Spring 1996.

“Environmental Issues and Air Pollution,” IEP, UCR, October 1996.

PROFESSIONAL AFFILIATIONS AND HONORS

President of India Gold Medal, IIT Kharagpur, India, 1983.

Member of the Alternatives Assessment Committee of the Grand Canyon Visibility Transport Commission, established by the Clean Air Act Amendments of 1990, 1992-present.

American Society of Mechanical Engineers: Los Angeles Section Executive Committee, Heat Transfer Division, and Fuels and Combustion Technology Division, 1987-present.

Air and Waste Management Association, West Coast Section, 1989-present.

PROFESSIONAL CERTIFICATIONS

EIT, California (# XE088305), 1993.

REA I, California (#07438), 2000.

Certified Permitting Professional, South Coast AQMD (#C8320), since 1993.

QEP, Institute of Professional Environmental Practice, since 2000.

CEM, State of Nevada (#EM-1699). Expiration 10/07/2011.

PUBLICATIONS (PARTIAL LIST)

"Physical Properties and Oxidation Rates of Chars from Bituminous Coals," with Y.A. Levendis, R.C. Flagan and G.R. Gavalas, *Fuel*, **67**, 275-283 (1988).

"Char Combustion: Measurement and Analysis of Particle Temperature Histories," with R.C. Flagan, G.R. Gavalas and P.S. Northrop, *Comb. Sci. Tech.* **60**, 215-230 (1988).

"On the Combustion of Bituminous Coal Chars," PhD Thesis, California Institute of Technology (1988).

"Optical Pyrometry: A Powerful Tool for Coal Combustion Diagnostics," *J. Coal Quality*, **8**, 17-22 (1989).

"Post-Ignition Transients in the Combustion of Single Char Particles," with Y.A. Levendis, R.C.Flagan and G.R. Gavalas, *Fuel*, **68**, 849-855 (1989).

"A Model for Single Particle Combustion of Bituminous Coal Char." Proc. ASME National Heat Transfer Conference, Philadelphia, **HTD-Vol. 106**, 505-513 (1989).

"Discrete Simulation of Cenospheric Coal-Char Combustion," with R.C. Flagan and G.R.Gavalas, *Combust. Flame*, **77**, 337-346 (1989).

"Particle Measurements in Coal Combustion," with R.C. Flagan, in "**Combustion Measurements**" (ed. N. Chigier), Hemisphere Publishing Corp. (1991).

"Cross Linking in Pore Structures and Its Effect on Reactivity," with G.R. Gavalas in preparation.

"Natural Frequencies and Mode Shapes of Straight Tubes," Proprietary Report for Heat Transfer Research Institute, Alhambra, CA (1990).

"Optimal Tube Layouts for Kamui SL-Series Exchangers," with K. Ishihara, Proprietary Report for Kamui Company Limited, Tokyo, Japan (1990).

"HTRI Process Heater Conceptual Design," Proprietary Report for Heat Transfer Research Institute, Alhambra, CA (1990).

"Asymptotic Theory of Transonic Wind Tunnel Wall Interference," with N.D. Malmuth and others, Arnold Engineering Development Center, Air Force Systems Command, USAF (1990).

"Gas Radiation in a Fired Heater Convection Section," Proprietary Report for Heat Transfer Research Institute, College Station, TX (1990).

"Heat Transfer and Pressure Drop in NTIW Heat Exchangers," Proprietary Report for Heat Transfer Research Institute, College Station, TX (1991).

"NOx Control and Thermal Design," Thermal Engineering Tech Briefs, (1994).

“From Puchase of Landmark Environmental Insurance to Remediation: Case Study in Henderson, Nevada,” with Robin E. Bain and Jill Quillin, presented at the AQMA Annual Meeting, Florida, 2001.

“The Jones Act Contribution to Global Warming, Acid Rain and Toxic Air Contaminants,” with Charles W. Botsford, presented at the AQMA Annual Meeting, Florida, 2001.

PRESENTATIONS (PARTIAL LIST)

"Pore Structure and Combustion Kinetics - Interpretation of Single Particle Temperature-Time Histories," with P.S. Northrop, R.C. Flagan and G.R. Gavalas, presented at the AIChE Annual Meeting, New York (1987).

"Measurement of Temperature-Time Histories of Burning Single Coal Char Particles," with R.C. Flagan, presented at the American Flame Research Committee Fall International Symposium, Pittsburgh, (1988).

"Physical Characterization of a Cenospheric Coal Char Burned at High Temperatures," with R.C. Flagan and G.R. Gavalas, presented at the Fall Meeting of the Western States Section of the Combustion Institute, Laguna Beach, California (1988).

"Control of Nitrogen Oxide Emissions in Gas Fired Heaters - The Retrofit Experience," with G. P. Croce and R. Patel, presented at the International Conference on Environmental Control of Combustion Processes (Jointly sponsored by the American Flame Research Committee and the Japan Flame Research Committee), Honolulu, Hawaii (1991).

"Air Toxics - Past, Present and the Future," presented at the Joint AIChE/AAEE Breakfast Meeting at the AIChE 1991 Annual Meeting, Los Angeles, California, November 17-22 (1991).

"Air Toxics Emissions and Risk Impacts from Automobiles Using Reformulated Gasolines," presented at the Third Annual Current Issues in Air Toxics Conference, Sacramento, California, November 9-10 (1992).

"Air Toxics from Mobile Sources," presented at the Environmental Health Sciences (ESE) Seminar Series, UCLA, Los Angeles, California, November 12, (1992).

"Kilns, Ovens, and Dryers - Present and Future," presented at the Gas Company Air Quality Permit Assistance Seminar, Industry Hills Sheraton, California, November 20, (1992).

"The Design and Implementation of Vehicle Scrapping Programs," presented at the 86th Annual Meeting of the Air and Waste Management Association, Denver, Colorado, June 12, 1993.

"Air Quality Planning and Control in Beijing, China," presented at the 87th Annual Meeting of the Air and Waste Management Association, Cincinnati, Ohio, June 19-24, 1994.

Annex A

Expert Litigation Support

1. Matters for which Dr. Sahu has have provided depositions and affidavits/expert reports include:

(a) Deposition on behalf of Rocky Mountain Steel Mills, Inc. located in Pueblo, Colorado – dealing with the manufacture of steel in mini-mills including methods of air pollution control and BACT in steel mini-mills and opacity issues at this steel mini-mill

(b) Affidavit for Rocky Mountain Steel Mills, Inc. located in Pueblo Colorado – dealing with the technical uncertainties associated with night-time opacity measurements in general and at this steel mini-mill.

(c) Expert reports and depositions (2/28/2002 and 3/1/2002; 12/2/2003 and 12/3/2003; 5/24/2004) on behalf of the US Department of Justice in connection with the Ohio Edison NSR Cases. *United States, et al. v. Ohio Edison Co., et al.*, C2-99-1181 (S.D. Ohio).

(d) Expert reports and depositions (5/23/2002 and 5/24/2002) on behalf of the US Department of Justice in connection with the Illinois Power NSR Case. *United States v. Illinois Power Co., et al.*, 99-833-MJR (S.D. Ill.).

(e) Expert reports and depositions (11/25/2002 and 11/26/2002) on behalf of the US Department of Justice in connection with the Duke Power NSR Case. *United States, et al. v. Duke Energy Corp.*, 1:00-CV-1262 (M.D.N.C.).

(f) Expert reports and depositions (10/6/2004 and 10/7/2004; 7/10/2006) on behalf of the US Department of Justice in connection with the American Electric Power NSR Cases. *United States, et al. v. American Electric Power Service Corp., et al.*, C2-99-1182, C2-99-1250 (S.D. Ohio).

(g) Affidavit (March 2005) on behalf of the Minnesota Center for Environmental Advocacy and others in the matter of the Application of Heron Lake BioEnergy LLC to construct and operate an ethanol production facility – submitted to the Minnesota Pollution Control Agency.

(h) Expert reports and depositions (10/31/2005 and 11/1/2005) on behalf of the US Department of Justice in connection with the East Kentucky Power Cooperative NSR Case. *United States v. East Kentucky Power Cooperative, Inc*., 5:04-cv-00034-KSF (E.D. KY).

(i) Deposition (10/20/2005) on behalf of the US Department of Justice in connection with the Cinergy NSR Case. *United States, et* al. *v. Cinergy Corp., et al.*, IP 99-1693-C-M/S (S.D. Ind.).

(j) Affidavits and deposition on behalf of Basic Management Inc. (BMI) Companies in connection with the BMI vs. USA remediation cost recovery Case.

(k) Expert report on behalf of Penn Future and others in the Cambria Coke plant permit challenge in Pennsylvania.

(l) Expert report on behalf of the Appalachian Center for the Economy and the Environment and others in the Western Greenbrier permit challenge in West Virginia.

(m) Expert report, deposition (via telephone on January 26, 2007) on behalf of various Montana petitioners (Citizens Awareness Network (CAN), Women's Voices for the Earth (WVE) and the Clark Fork Coalition (CFC)) in the Thompson River Cogeneration LLC Permit No. 3175-04 challenge.

(n) Expert report and deposition (2/2/07) on behalf of the Texas Clean Air Cities Coalition at the Texas State Office of Administrative Hearings (SOAH) in the matter of the permit challenges to TXU Project Apollo's eight new proposed PRB-fired PC boilers located at seven TX sites.

(o) Expert testimony (July 2007) on behalf of the Izaak Walton League of America and others in connection with the acquisition of power by Xcel Energy from the proposed Gascoyne Power Plant – at the State of Minnesota, Office of Administrative Hearings for the Minnesota PUC (MPUC No. E002/CN-06-1518; OAH No. 12-2500-17857-2).

(p) Affidavit (July 2007) Comments on the Big Cajun I Draft Permit on behalf of the Sierra Club – submitted to the Louisiana DEQ.

(q) Expert reports and deposition (12/13/2007) on behalf of Commonwealth of Pennsylvania – Dept. of Environmental Protection, State of Connecticut, State of New York, and State of New Jersey (Plaintiffs) in connection with the Allegheny Energy NSR Case. *Plaintiffs v. Allegheny Energy Inc., et al.,* 2:05cv0885 (W.D. Pennsylvania).

(r) Expert reports and pre-filed testimony before the Utah Air Quality Board on behalf of Sierra Club in the Sevier Power Plant permit challenge.

(s) Expert reports and deposition (October 2007) on behalf of MTD Products Inc., in connection with General Power Products, LLC v MTD Products Inc., 1:06 CVA 0143 (S.D. Ohio, Western Division)

(t) Experts report and deposition (June 2008) on behalf of Sierra Club and others in the matter of permit challenges (Title V: 28.0801-29 and PSD: 28.0803-PSD) for the Big Stone II unit, proposed to be located near Milbank, South Dakota.

(u) Expert reports, affidavit, and deposition (August 15, 2008) on behalf of Earthjustice in the matter of air permit challenge (CT-4631) for the Basin Electric Dry Fork station, under construction near Gillette, Wyoming before the Environmental Quality Council of the State of Wyoming.

(v) Affidavits (May 2010/June 2010 in the Office of Administrative Hearings))/Declaration and Expert Report (November 2009 in the Office of Administrative Hearings) on behalf of NRDC and the Southern Environmental Law Center in the matter of the air permit challenge for Duke Cliffside Unit 6. Office of Administrative Hearing Matters 08 EHR 0771, 0835 and 0836 and 09 HER 3102, 3174, and 3176 (consolidated).

(w) Declaration (August 2008), Expert Report (January 2009), and Declaration (May 2009) on behalf of Southern Alliance for Clean Energy et al., v Duke Energy Carolinas, LLC. in the matter of the air permit challenge for Duke Cliffside Unit 6. *Southern Alliance for Clean Energy et al., v. Duke Energy Carolinas, LLC*, Case No. 1:08-cv-00318-LHT-DLH (Western District of North Carolina, Asheville Division).

(x) Dominion Wise County MACT Declaration (August 2008)

(y) Expert Report on behalf of Sierra Club for the Green Energy Resource Recovery Project, MACT Analysis (June 13, 2008).

(z) Expert Report on behalf of Sierra Club and the Environmental Integrity Project in the matter of the air permit challenge for NRG Limestone's proposed Unit 3 in Texas (February 2009).

(aa) Expert Report and deposition on behalf of MTD Products, Inc., in the matter of Alice Holmes and Vernon Holmes v. Home Depot USA, Inc., et al. (June 2009, July 2009).

(bb) Expert Report on behalf of Sierra Club and the Southern Environmental Law Center in the matter of the air permit challenge for Santee Cooper's proposed Pee Dee plant in South Carolina (August 2009).

(cc) Statements (May 2008 and September 2009) on behalf of the Minnesota Center for Environmental Advocacy to the Minnesota Pollution Control Agency in the matter of the Minnesota Haze State Implementation Plans.

(dd) Expert Report (August 2009) and Deposition (October 2009) on behalf of Environmental Defense, in the matter of permit challenges to the proposed Las Brisas coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

(ee) Deposition (October 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed Coleto Creek coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH). (October 2009).

(ff) Expert Report, Rebuttal Report (September 2009) and Deposition (October 2009) on behalf of the Sierra Club, in the matter of challenges to the proposed Medicine Bow Fuel and Power IGL plant in Cheyenne, Wyoming.

(gg) Expert Report (December 2009), Rebuttal reports (May 2010 and June 2010) and depositions (June 2010) on behalf of the US Department of Justice in connection with the Alabama Power Company NSR Case. *United States v. Alabama Power Company*, CV-01-HS-152-S (Northern District of Alabama, Southern Division).

(hh) Prefiled testimony (October 2009) and Deposition (December 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed White Stallion Energy Center coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

(ii) Deposition (October 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed Tenaska coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH). (April 2010).

(jj) Written Direct Testimony (July 2010) and Written Rebuttal Testimony (August 2010) on behalf of the State of New Mexico Environment Department in the matter of Proposed Regulation 20.2.350 NMAC – *Greenhouse Gas Cap and Trade Provisions*, No. EIB 10-04 (R), to the State of New Mexico, Environmental Improvement Board.

(kk) Expert report (August 2010) and Rebuttal Expert Report (October 2010) on behalf of the US Department of Justice in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana) – Liability Phase.

(ll) Declaration (August 2010), Reply Declaration (November 2010), Expert Report (April 2011), Supplemental and Rebuttal Expert Report (July 2011) on behalf of the US EPA and US Department of Justice in the matter of DTE Energy Company and Detroit Edison Company (Monroe Unit 2). *United States of America v. DTE Energy Company and Detroit Edison Company*, Civil Action No. 2:10-cv-13101-BAF-RSW (US District Court for the Eastern District of Michigan).

(mm) Expert Report and Deposition (August 2010) as well as Affidavit (September 2010) on behalf of Kentucky Waterways Alliance, Sierra Club, and Valley Watch in the matter of challenges to the NPDES permit issued for the Trimble County power plant by the Kentucky Energy and Environment Cabinet to Louisville Gas and Electric, File No. DOW-41106-047.

(nn) Expert Report (August 2010), Rebuttal Expert Report (September 2010), Supplemental Expert Report (September 2011), and Declaration (November 2011) on behalf of Wild Earth Guardians in the matter of opacity exceedances and monitor downtime at the Public Service Company of Colorado (Xcel)'s Cherokee power plant. No. 09-cv-1862 (D. Colo.).

(oo) Written Direct Expert Testimony (August 2010) and Affidavit (February 2012) on behalf of Fall-Line Alliance for a Clean Environment and others in the matter of the PSD Air Permit for Plant Washington issued by Georgia DNR at the Office of State Administrative Hearing, State of Georgia (OSAH-BNR-AQ-1031707-98-WALKER).

(pp) Deposition (August 2010) on behalf of Environmental Defense, in the matter of the remanded permit challenge to the proposed Las Brisas coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

(qq) Expert Report, Supplemental/Rebuttal Expert Report, and Declarations (October 2010, September 2012) on behalf of New Mexico Environment Department (Plaintiff-Intervenor), Grand Canyon Trust and Sierra Club (Plaintiffs) in the matter of Public Service Company of New Mexico (PNM)'s Mercury Report for the San Juan Generating Station, CIVIL NO. 1:02-CV-0552 BB/ATC (ACE). US District Court for the District of New Mexico.

(rr) Comment Report (October 2010) on the Draft Permit Issued by the Kansas DHE to Sunflower Electric for Holcomb Unit 2. Prepared on behalf of the Sierra Club and Earthjustice.

(ss) Expert Report (October 2010) and Rebuttal Expert Report (November 2010) (BART Determinations for PSCo Hayden and CSU Martin Drake units) to the Colorado Air Quality Commission on behalf of Coalition of Environmental Organizations.

(tt) Expert Report (November 2010) (BART Determinations for TriState Craig Units, CSU Nixon Unit, and PRPA Rawhide Unit) to the Colorado Air Quality Commission on behalf of Coalition of Environmental Organizations.

(uu) Declaration (November 2010) on behalf of the Sierra Club in connection with the Martin Lake Station Units 1, 2, and 3. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Case No. 5:10-cv-00156-DF-CMC (US District Court for the Eastern District of Texas, Texarkana Division).

(vv) Comment Report (December 2010) on the Pennsylvania Department of Environmental Protection (PADEP)'s Proposal to grant Plan Approval for the Wellington Green Energy Resource Recovery Facility on behalf of the Chesapeake Bay Foundation, Group Against Smog and Pollution (GASP), National Park Conservation Association (NPCA), and the Sierra Club.

(ww) Written Expert Testimony (January 2011) and Declaration (February 2011) to the Georgia Office of State Administrative Hearings (OSAH) in the matter of Minor Source HAPs status for the proposed Longleaf Energy Associates power plant (OSAH-BNR-AQ-1115157-60-HOWELLS) on behalf of the Friends of the Chattahoochee and the Sierra Club).

(xx) Declaration (February 2011) in the matter of the Draft Title V Permit for RRI Energy MidAtlantic Power Holdings LLC Shawville Generating Station (Pennsylvania), ID No. 17-00001 on behalf of the Sierra Club.

(yy) Expert Report (March 2011), Rebuttal Expert Report (Jue 2011) on behalf of the United States in *United States of America v. Cemex, Inc.*, Civil Action No. 09-cv-00019-MSK-MEH (US District Court for the District of Colorado).

(zz) Declaration (April 2011) and Expert Report (July 16, 2012) in the matter of the Lower Colorado River Authority (LCRA)'s Fayette (Sam Seymour) Power Plant on behalf of the Texas Campaign for the Environment. *Texas Campaign for the Environment v. Lower Colorado River Authority*, Civil Action No. 4:11-cv-00791 (US District Court for the Southern District of Texas, Houston Division).

(aaa) Declaration (June 2011) on behalf of the Plaintiffs MYTAPN in the matter of Microsoft-Yes, Toxic Air Pollution-No (MYTAPN) v. State of Washington, Department of Ecology and Microsoft Corporation Columbia Data Center to the Pollution Control Hearings Board, State of Washington, Matter No. PCHB No. 10-162.

(bbb) Expert Report (June 2011) on behalf of the New Hampshire Sierra Club at the State of New Hampshire Public Utilities Commission, Docket No. 10-261 – the 2010 Least Cost Integrated Resource Plan (LCIRP) submitted by the Public Service Company of New Hampshire (re. Merrimack Station Units 1 and 2).

(ccc) Declaration (August 2011) in the matter of the Sandy Creek Energy Associates L.P. Sandy Creek Power Plant on behalf of Sierra Club and Public Citizen. *Sierra Club, Inc. and Public Citizen, Inc. v. Sandy Creek Energy Associates, L.P.*, Civil Action No. A-08-CA-648-LY (US District Court for the Western District of Texas, Austin Division).

(ddd) Expert Report (October 2011) on behalf of the Defendants in the matter of *John Quiles and Jeanette Quiles et al. v. Bradford-White Corporation, MTD Products, Inc., Kohler Co., et al.*, Case No. 3:10-cv-747 (TJM/DEP) (US District Court for the Northern District of New York).

(eee) Declaration (February 2012) and Second Declaration (February 2012) in the matter of *Washington Environmental Council and Sierra Club Washington State Chapter v. Washington State Department of Ecology and Western States Petroleum Association*, Case No. 11-417-MJP (US District Court for the Western District of Washington).

(fff) Expert Report (March 2012) in the matter of *Environment Texas Citizen Lobby, Inc and Sierra Club v. ExxonMobil Corporation et al.*, Civil Action No. 4:10-cv-4969 (US District Court for the Southern District of Texas, Houston Division).

(ggg) Declaration (March 2012) in the matter of *Center for Biological Diversity, et al. v. United States Environmental Protection Agency*, Case No. 11-1101 (consolidated with 11-1285, 11-1328 and 11-1336) (US Court of Appeals for the District of Columbia Circuit).

(hhh) Declaration (March 2012) in the matter of *Sierra Club v. The Kansas Department of Health and Environment*, Case No. 11-105,493-AS (Holcomb power plan) (Supreme Court of the State of Kansas).

(iii) Declaration (March 2012) in the matter of the Las Brisas Energy Center *Environmental Defense Fund et al., v. Texas Commission on Environmental Quality*, Cause No. D-1-GN-11-001364 (District Court of Travis County, Texas, 261st Judicial District).

(jjj) Expert Report (April 2012), Supplemental and Rebuttal Expert Report (July 2012), and Supplemental Rebuttal Expert Report (August 2012) in the matter of the Portland Power plant *State of New Jersey and State of Connecticut (Intervenor-Plaintiff) v. RRI Energy Mid-Atlantic Power Holdings et al.*, Civil Action No. 07-CV-5298 (JKG) (US District Court for the Eastern District of Pennsylvania).

(kkk) Declaration (April 2012) in the matter of the EPA's EGU MATS Rule, on behalf of the Environmental Integrity Project

(lll) Declaration (September 2012) in the Matter of the Application of *Energy Answers Incinerator, Inc.* for a Certificate of Public Convenience and Necessity to Construct a 120 MW Generating Facility in Baltimore City, Maryland, before the Public Service Commission of Maryland, Case No. 9199.

(mmm) Expert report (August 2012) on behalf of the US Department of Justice in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana) – Harm Phase.

2. Occasions where Dr. Sahu has provided Written or Oral testimony before Congress:

(nnn) In July 2012, provided expert written and oral testimony to the House Subcommittee on Energy and the Environment, Committee on Science, Space, and Technology at a Hearing entitled "Hitting the Ethanol Blend Wall – Examining the Science on E15."

3. Occasions where Dr. Sahu has provided oral testimony at trial or in similar proceedings include the following:

(ooo) In February, 2002, provided expert witness testimony on emissions data on behalf of Rocky Mountain Steel Mills, Inc. in Denver District Court.

(ppp) In February 2003, provided expert witness testimony on regulatory framework and emissions calculation methodology issues on behalf of the US Department of Justice in the Ohio Edison NSR Case in the US District Court for the Southern District of Ohio.

(qqq) In June 2003, provided expert witness testimony on regulatory framework, emissions calculation methodology, and emissions calculations on behalf of the US Department of Justice in the Illinois Power NSR Case in the US District Court for the Southern District of Illinois.

(rrr) In August 2006, provided expert witness testimony regarding power plant emissions and BACT issues on a permit challenge (Western Greenbrier) on behalf of the Appalachian Center for the Economy and the Environment in West Virginia.

(sss) In May 2007, provided expert witness testimony regarding power plant emissions and BACT issues on a permit challenge (Thompson River Cogeneration) on behalf of various Montana petitioners (Citizens Awareness Network (CAN), Women's Voices for the Earth (WVE) and the Clark Fork Coalition (CFC)) before the Montana Board of Environmental Review.

(ttt) In October 2007, provided expert witness testimony regarding power plant emissions and BACT issues on a permit challenge (Sevier Power Plant) on behalf of the Sierra Club before the Utah Air Quality Board.

(uuu) In August 2008, provided expert witness testimony regarding power plant emissions and BACT issues on a permit challenge (Big Stone Unit II) on behalf of the Sierra Club and Clean Water before the South Dakota Board of Minerals and the Environment.

(vvv) In February 2009, provided expert witness testimony regarding power plant emissions and BACT issues on a permit challenge (Santee Cooper Pee Dee units) on behalf of the Sierra Club and the Southern Environmental Law Center before the South Carolina Board of Health and Environmental Control.

(www) In February 2009, provided expert witness testimony regarding power plant emissions, BACT issues and MACT issues on a permit challenge (NRG Limestone Unit 3) on behalf of the Sierra Club and the Environmental Integrity Project before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.

(xxx) In November 2009, provided expert witness testimony regarding power plant emissions, BACT issues and MACT issues on a permit challenge (Las Brisas Energy Center) on behalf of the Environmental Defense Fund before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.

(yyy) In February 2010, provided expert witness testimony regarding power plant emissions, BACT issues and MACT issues on a permit challenge (White Stallion Energy Center) on behalf of the Environmental Defense Fund before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.

(zzz) In September 2010 provided oral trial testimony on behalf of Commonwealth of Pennsylvania – Dept. of Environmental Protection, State of Connecticut, State of New York, State of Maryland, and State of New Jersey (Plaintiffs) in connection with the Allegheny Energy NSR Case in US District Court in the Western District of Pennsylvania. *Plaintiffs v. Allegheny Energy Inc., et al.*, 2:05cv0885 (W.D. Pennsylvania).

(aaaa) Oral Direct and Rebuttal Expert Testimony (September 2010) on behalf of Fall-Line Alliance for a Clean Environment and others in the matter of the PSD Air Permit for Plant Washington issued by Georgia DNR at the Office of State Administrative Hearing, State of Georgia (OSAH-BNR-AQ-1031707-98-WALKER).

(bbbb) Oral Testimony (September 2010) on behalf of the State of New Mexico Environment Department in the matter of Proposed Regulation 20.2.350 NMAC – *Greenhouse Gas Cap and Trade Provisions*, No. EIB 10-04 (R), to the State of New Mexico, Environmental Improvement Board.

(cccc) Oral Testimony (October 2010) regarding mercury and total PM/PM10 emissions and other issues on a remanded permit challenge (Las Brisas Energy Center) on behalf of the Environmental Defense Fund before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.

(dddd) Oral Testimony (November 2010) regarding BART for PSCo Hayden, CSU Martin Drake units before the Colorado Air Quality Commission on behalf of the Coalition of Environmental Organizations.

(eeee) Oral Testimony (December 2010) regarding BART for TriState Craig Units, CSU Nixon Unit, and PRPA Rawhide Unit) before the Colorado Air Quality Commission on behalf of the Coalition of Environmental Organizations.

(ffff) Deposition (December 2010) on behalf of the US Department of Justice in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana).

(gggg) Deposition (February 2011 and January 2012) on behalf of Wild Earth Guardians in the matter of opacity exceedances and monitor downtime at the Public Service Company of Colorado (Xcel)'s Cherokee power plant. No. 09-cv-1862 (D. Colo.).

(hhhh) Oral Expert Testimony (February 2011) to the Georgia Office of State Administrative Hearings (OSAH) in the matter of Minor Source HAPs status for the proposed Longleaf Energy Associates power plant (OSAH-BNR-AQ-1115157-60-HOWELLS) on behalf of the Friends of the Chattahoochee and the Sierra Club).

(iiii) Deposition (August 2011) on behalf of the United States in *United States of America v. Cemex, Inc.*, Civil Action No. 09-cv-00019-MSK-MEH (US District Court for the District of Colorado).

(jjjj) Deposition (July 2011) and Oral Testimony at Hearing (February 2012) on behalf of the Plaintiffs MYTAPN in the matter of Microsoft-Yes, Toxic Air Pollution-No (MYTAPN) v. State of Washington, Department of Ecology and Microsoft Corporation Columbia Data Center to the Pollution Control Hearings Board, State of Washington, Matter No. PCHB No. 10-162.

(kkkk) Oral Testimony at Hearing (March 2012) on behalf of the US Department of Justice in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana).

(llll) Oral Testimony at Hearing (April 2012) on behalf of the New Hampshire Sierra Club at the State of New Hampshire Public Utilities Commission, Docket No. 10-261 – the 2010 Least Cost Integrated Resource Plan (LCIRP) submitted by the Public Service Company of New Hampshire (re. Merrimack Station Units 1 and 2).

ATTACHMENT B

COPIES OF CALCULATIONS SPREADSHEETS

CPC Mojave CA, Mill-On

Company	CalPortland Cement (CPC)
Location	Mojave, CA
Type of Kiln	Long, Dry
Emission Location	Baghouse
Pollutant	filterable PM (fPM)
Test Method	EPA Method 5
Source of Data	CPC Mojave Plant, Final Test Report, URS, 12/7/12

Data

Average Run Time 1-Hr (approx, 72 mins)

Run #		1	2	3	Average	
Filterable PM	lb/hr	11.7	12	19.2	14.3	
Raw Materials Processed	tons/hr					[Not required, clinker data directly from test]
Estimated Clinker Produced	tons/hr	189	186	175	183.3	
fPM Emission Rate	lb/ton clinker	0.0619	0.0645	0.1097	0.0787	

99 UPL	lb/ton clinker	0.232	[from EPA UPL Calculator, m=3]

Appendix F: PM UPL Calculation for New Sources

New PM UPL Runs	NonCISWI Kiln Emissions (lb/ton clinker) CalPortland, Mojave, Mill-On
1	0.061904762
2	0.064516129
3	0.109714286
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	
26	
27	
28	
29	
30	
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33	
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35	

Appendix F: PM UPL Calculation for New Sources

ni = number test runs =		3	0	0	0	0	0	0	0	0	0	0
Number of sources =	N	1										
n =Total # test runs	$\sum_{i=1}^{N} n_i$	3										
$df = \left(\sum_{i=1}^{N} n_i\right) - 1$		2										

This step is for QC only:

means	$\overline{x}_i = \frac{1}{n_i}\sum_{k=1}^{n_i} x_{ik}$	0.078711726
Mean =	$\overline{X} = \frac{1}{n}\sum_{i=1}^{N}\sum_{j=1}^{n_i} x_{ij}$	0.078711726
Pooled Variance =	$s^2 = \frac{1}{n-1}\sum_{i=1}^{n}\left(x_i - \overline{X}\right)^2$	0.000722574
m= number future runs =		3
Term1	$\frac{1}{n} + \frac{1}{m}$	0.666666667
Term2	$s^2\left(\frac{1}{n} + \frac{1}{m}\right)$	0.000481716
Squared root Term2	$\sqrt{s^2\left(\frac{1}{n} + \frac{1}{m}\right)}$	0.021948027

Appendix F: PM UPL Calculation for New Sources

NOTE: the pvalue for the t-statistic is calculated as: 2*alpha, where 1-alpha is desired confidence, so if 99% confidence is desired then alpha=0.01 and 2*alpha=2*(0.01)

t-statistic t_{df} = quantile t-distribution with df degrees of freedom at .99 confidence level = 6.964556734

UPL POOLED VARIANCE = 0.231570008

$$\bar{X} + t_{df,p}\sqrt{s^2\left(\frac{1}{n}+\frac{1}{m}\right)}$$

CPC Mojave CA, Mill-Off

Company	CalPortland Cement (CPC)
Location	Mojave, CA
Type of Kiln	Long, Dry
Emission Location	Baghouse
Pollutant	filterable PM (fPM)
Test Method	EPA Method 5
Source of Data	CPC Mojave Plant, Final Test Report, URS, 12/7/12

Data

Average Run Time 1-Hr

Run #		1	2	3	Average	
Filterable PM	lb/hr	15.4	18	13.6	15.7	
Raw Materials Processed	tons/hr					[Not required, clinker data directly from test]
Estimated Clinker Produced	tons/hr	144	178	165	162.3	
fPM Emission Rate	lb/ton clinker	0.1069	0.1011	0.0824	0.0968	

99 UPL	lb/ton clinker	0.170	[from EPA UPL Calculator, m=3]

Appendix F: PM UPL Calculation for New Sources

New PM UPL Runs	NonCISWI Kiln Emissions (lb/ton clinker) CalPortland, Mojave, Mill-Off
1	0.106944444
2	0.101123596
3	0.082424242
4	
5	
6	
7	
8	
9	
10	
11	
12	
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14	
15	
16	
17	
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Appendix F: PM UPL Calculation for New Sources

ni = number test runs =	3	0	0	0	0	0	0	0	0	0	0

Number of sources = N 1

n =Total # test runs $\sum_{i=1}^{N} n_i$ 3

$df = \left(\sum_{i=1}^{N} n_i\right) - 1$ 2

This step is for QC only:

means $\overline{x}_i = \frac{1}{n_i}\sum_{k=1}^{n_i} x_{ik}$ 0.096830761

Mean = $\overline{X} = \frac{1}{n}\sum_{i=1}^{N}\sum_{j=1}^{n_i} x_{ij}$ 0.096830761

Pooled Variance = 0.000164131

$s^2 = \frac{1}{n-1}\sum_{i=1}^{n}\left(x_i - \overline{X}\right)^2$

m= number future runs = 3

Term1 $\frac{1}{n} + \frac{1}{m}$ 0.666666667

Term2 $s^2\left(\frac{1}{n} + \frac{1}{m}\right)$ 0.000109421

Squared root Term2 $\sqrt{s^2\left(\frac{1}{n} + \frac{1}{m}\right)}$ 0.010460446

Appendix F: PM UPL Calculation for New Sources

NOTE: the pvalue for the t-statistic is calculated as: 2*alpha, where 1-alpha is desired confidence, so if 99% confidence is desired then alpha=0.01 and 2*alpha=2*(0.01)

t-statistic t_{df} = quantile t-distribution with df degrees of freedom at .99 confidence level = 6.964556734

UPL POOLED VARIANCE = 0.169683131

$$\boxed{\bar{X} + t_{df,p}\sqrt{s^2\left(\frac{1}{n} + \frac{1}{m}\right)}}$$

Cemex Knoxville TN

Company	Cemex
Location	Knoxville, TN
Type of Kiln	Long, Dry
Emission Location	Baghouse
Pollutant	filterable PM (fPM)
Test Method	EPA Method 5
Sources of Data	Cemex Knoxville Kiln PM Compliance Test, Final Test Report, URS, 8/27/12 & Compliance Test Report for the Kiln Baghouse Stack: Dioxin/Furans & Particulate Matter, URS, 8/27/12

Data

Average Run Time 3-Hrs

Run #		1	2	3	Average	
Filterable PM	lb/hr	19.01	17.54	19.46	18.67	
Raw Materials Processed	tons/hr	160	160	160	160	
Estimated Clinker Produced	tons/hr	97	97	97	97	[Used Raw Materials/Clinker = 1.65, per EPA]
fPM Emission Rate	lb/ton clinker	0.1960	0.1809	0.2007	0.1925	

99 UPL	lb/ton clinker	0.251	[from EPA UPL Calculator, m=3]

Appendix F: PM UPL Calculation for New Sources

New PM UPL Runs	NonCISWI Kiln Emissions (lb/ton clinker) Cemex, Knoxville TN
1	0.196040625
2	0.18088125
3	0.20068125
4	
5	
6	
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Appendix F: PM UPL Calculation for New Sources

ni = number test runs = 3 0 0 0 0 0 0 0 0 0 0

Number of sources = $\boxed{N}$ 1

n =Total # test runs $\boxed{\sum_{i=1}^{N} n_i}$ 3

$\boxed{df = \left(\sum_{i=1}^{N} n_i\right) - 1}$ 2

This step is for QC only:

means $\boxed{\overline{x}_i = \frac{1}{n_i}\sum_{k=1}^{n_i} x_{ik}}$ 0.192534375

Mean = $\boxed{\overline{X} = \frac{1}{n}\sum_{i=1}^{N}\sum_{j=1}^{n_i} x_{ij}}$ 0.192534375

Pooled Variance = 0.00010723

$\boxed{s^2 = \frac{1}{n-1}\sum_{i=1}^{n}\left(x_i - \overline{X}\right)^2}$

m= number future runs = 3

Term1 $\boxed{\frac{1}{n} + \frac{1}{m}}$ 0.666666667

Term2 $\boxed{s^2\left(\frac{1}{n} + \frac{1}{m}\right)}$ 7.14869E-05

Squared root Term2 $\boxed{\sqrt{s^2\left(\frac{1}{n} + \frac{1}{m}\right)}}$ 0.008454992

Appendix F: PM UPL Calculation for New Sources

NOTE: the pvalue for the t-statistic is calculated as: 2*alpha, where 1-alpha is desired confidence, so if 99% confidence is desired then alpha=0.01 and 2*alpha=2*(0.01)

t-statistic t_{df} = quantile t-distribution with df degrees of freedom at .99 confidence level = 6.964556734

UPL POOLED VARIANCE = 0.251419648

$$\boxed{\bar{X} + t_{df,p}\sqrt{s^2\left(\frac{1}{n}+\frac{1}{m}\right)}}$$

Company	Cemex
Location	Lyons, CO
Type of Kiln	
Emission Location	Baghouse
Pollutant	filterable PM (fPM)
Test Method	Reported emissions
Source of Data	Colorado Department of Public Health and Environment Emissions Inventory

Data

Average Run Time N/A

Year		2009	2010	2011	Average	
Filterable PM10	lb/year	35,016	41,300	42,160	39,492	
Raw Materials Processed	tons/yr	312,845	343,731	344,846		
Estimated Clinker Produced	tons/yr	189,603.0	208,321.8	208,997.6	202,307.5	[Using 1.65=Raw Materials/Clinker Ratio, from EPA]
fPM Emission Rate	lb/ton clinker	0.1847	0.1983	0.2017	0.1949	

99 UPL	lb/ton clinker	Not calculated, given data source

Cemex, Lyons CO (Hg)

Company	Cemex
Location	Lyons, CO
Type of Kiln	
Emission Location	Baghouse
Pollutant	Mercury (Hg)
Test Method	Reported emissions
Source of Data	Colorado Department of Public Health and Environment Emissions Inventory

Data

Average Run Time N/A

Year		2009	2010	2011	Average	
Mercury	lb/year	20	37	38	32	
Raw Materials Processed	tons/yr	312,845	343,731	344,846		
Estimated Clinker Produced	tons/yr	189,603.0	208,321.8	208,997.6	202,307.5	[Using 1.65=Raw Materials/Clinker Ratio, from EPA]
Mercury Emission Rate	lb/million tons clinker	105.4835	177.6098	181.8203	154.9712	

99 UPL	lb/million tons clinker	Not calculated, given data source

DECLARATION OF YOLANDA M. ANDERSEN

1. I am the Director of Membership Operations and Member Services for the Sierra Club, a non-profit corporation organized under the laws of the State of California. I work in Sierra Club's national office in San Francisco, California. I became Director of Membership Operations and Member Services in 2010. In that capacity, I am responsible for planning, developing, and directing the programs, operations, and Club staff responsible for: providing information services to members, the operational and user aspects of the Club's member/donor database, the delivery of member/donor acknowledgments, the membership renewal and the door-to-door membership acquisition and conservation outreach program. My work requires that I be familiar with the Club's purpose, organization, structure and activities, and with environmental interests and concerns of Club members. My work also requires me to be familiar with the nature and scope of the Club's membership programs, its membership records, and the manner in which information on members can be retrieved.
2. The Sierra Club is a nonprofit corporation existing under the laws of California, with its principal place of business in San Francisco, CA. The Club is a membership organization dedicated to exploring, enjoying, and protecting the wild places of the earth, and to protecting and restoring the quality of the natural and human environment. The Club's actions to protect and enhance the environment include advocacy and litigation to strengthen and enforce environmental laws and regulations. Club members are greatly concerned about air quality, and the Club has a long history of activities at both the local and national levels to protect air quality, often working closely with our members to provide them with services and information that are helpful to them locally.
3. The Club regularly maintains membership records that include the address of each member. These records are regularly updated each business day to add new members, reflect address changes, and change membership status for those who are no longer active members. The records are maintained on a computer database, from which I obtained the information provided below.
4. Sierra Club currently has 598,309 individual members, residing in all 50 states.
5. Sierra Club has the following number of members residing in each of the following counties:
    a. Pima County, AZ: 3,258.
    b. Kern County, CA: 914
    c. Boulder County, CO: 2,991
    d. Hernando County, FL: 229
    e. Houston County, GA: 58
    f. Massac County, IL: 14
    g. Lasalle County, IL: 155

h. Clark County, IN: 87
i. Lawrence County, IN: 35
j. Jefferson County, MT: 29
k. Gallatin County, MT: 369
l. Cass County, NE: 28
m. Albany County, NY: 852
n. Warren County, NY: 157
o. Pontotoc County, OK: 20
p. Lawrence County, PA: 76
q. Northampton County, PA: 574
r. Pennington County, SD: 147
s. Knox County, TN: 715
t. Comal County, TX: 160
u. Ellis County, TX: 72
v. McLennan County, TX: 146

6. These are just some examples. Sierra Club members also live in many other cities, towns, and counties throughout the United States.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this 27th day of March, 2013.

Yolanda Andersen
Yolanda M. Andersen

DECLARATION OF DEIRDRE BUTLER

1. I am a member of Sierra Club, and have been since 2000. I currently serve as the Co-Chair and Treasurer for the Indian Peaks Group of the Rocky Mountain Chapter of the Club. I am also the Newsletter Editor and the Wildlife Chair, and I am a Local Outings Leader. I've also served in various other capacities on the Indian Peaks Group's Executive Committee since about 2003, including as Chair and Vice Chair.

2. I live with my husband in Lyons, Colorado, about 3 miles north-northwest of Cemex's Lyons cement plant. I've lived in that house since moving to Colorado in 2000. Until I retired in 2005, I worked in pharmaceuticals and medical devices and have a bachelor of science in biological sciences. Because of my involvement with the Sierra Club, I've kept learning about biology and ecology.

3. The Cemex plant is by the junction of Routes 36 and 66. I drive by the junction about once a week and can see the plant's smokestack. Once or twice a month, I can see white smoke coming out of it.

4. I go at least twice a week to work at Stonebridge Farm, a community supported agriculture (CSA) farm, from March until November. The farm is across the road and about 200 yards east of the Cemex plant. We have been involved with the farm for 8 years. Initially, we were paying members of the CSA who also volunteered to work there. We are now "barter" members, meaning that we work on the farm in exchange for our share of vegetables and fruits grown there. We get a wide variety of fruits and vegetables from the farm, including different types of lettuces, different types of peas, carrots, rutabagas, turnips, parsnips, garlic, onions, leeks, eggplant, tomatoes, cucumbers, peppers (bell, chilies), herbs (thyme, oregano, dill, parsley, cilantro, peppermint, basil), raspberries, and strawberries.

5. I also go to Boulder County Open Space 3 times a week for hiking. The Boulder County Open Space is about 1-3 miles from the plant. It's a combination of Ponderosa forest, grasslands, and

high mountain meadows. There I see nesting eagles, mule deer, elk, bear, and bobcat. I also see bald eagles along the St. Vrain River, just down from the Cemex plant.

6. My husband and I do not eat meat, nor do we eat fish at home. During the summer, all the vegetables we eat come from Stonebridge Farm. We also eat eggs from the chickens we keep at home. I particularly value eating local food because I believe it is less contaminated with industrial chemicals and the like than mass-produced foods.

7. We're breathing in the plant's emissions all the time: it's only 3 miles from my house. It is a concern. The food I eat and the air I breathe affect my health. Thus, the pollution from the plant enters my body and threatens my health. The longer the plant spews out more dangerous pollutants, the worse for me.

8. My husband and I have a very close relationship with Stonebridge Farm. We work there regularly (and enjoy it), and a large portion of the food we eat comes from there, too. I am concerned that prolonged high emissions from the plant would mean that the farm would have to close because of contamination concerns. I also very much enjoy my hikes, and enjoy seeing the birds and various mammals while I hike. I am concerned about impacts of emissions from the plant on our local ecosystem and wildlife. I am particularly concerned about the impact of mercury emissions from the plant on the ecosystem. Mercury accumulates up the food chain and doesn't dissipate.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this 29th day of March, 2013.

Deirdre J. Butler

DECLARATION OF RICHARD CARGILL

1. I am a member of Sierra Club, and have been since 2002.

2. I am 74 years old. I live with my wife in Longmont, Colorado, about 2 miles east of Cemex's Lyons cement plant. I can see the Cemex plant's smokestack from my home, and I can hear it operating. Now it operates generally at night. I've lived in that house since moving to Colorado in 1996 or 1997. My daughter lives in Lyons, about 10 miles from me, along with my 8-year-old grandson, who visits frequently.

3. I have been concerned about emissions from the Cemex plant since I moved here. In 1998, I helped organize a citizens' group to try to force the plant to clean up its emissions. As part of our efforts, I learned a lot about what cement plants emit, and how dangerous those pollutants are to human health and the environment. We also did research into meteorology and where the Cemex plant's emissions end up. We learned that a lot of heavy metals may end up in Lyons.

4. I am aware that EPA published a rule in 2013 that weakens the particulate matter standard for cement plants and gives them until September 2015 to come into compliance with the standards it published in 2010 and weakened in 2013. 78 Fed. Reg. 10,006, 10,053 (Feb. 12, 2013) (codified at 40 C.F.R. § 63.1351(c)). In the 2010 rule, EPA gave kilns until September 2013 to come into compliance with the standards. 78 Fed. Reg. at 10,022.

5. I am also aware, from air emissions data reported to the Colorado Department of Public Health and Environment, that the Cemex kiln will have to reduce its particulate matter pollution and mercury pollution emissions to come into compliance with either of EPA's cement rules.

6. I spend a lot of time outside—we get about 300 days of sunshine a year. I tend to our family's horses. I also care for our trees and garden. I grow potatoes, onions, tomatoes (60-80 plants), jalapeño and habanero peppers, parsnips, carrots, spinach, squash, melons, rhubarb, and grapes. We eat a lot of what we grow, and give the rest away.

7. I'm always working to stay in good health. I hike the roads and trails right by my house. I walk a couple or even 5 miles every other day. I regularly go on a road that's just out my door and goes into the countryside. I enjoy seeing the eagles, hawks, and coyotes in the area.

8. I am aware that mercury and particulate matter discharges from the cement plant can harm ecosystems and thus the plants and animals in the area. I am concerned that if the Cemex kiln is allowed to emit more dangerous pollution like mercury and particulate matter, it will harm the animals I enjoy seeing and the plants I enjoy growing and eating. I am also aware that mercury remains highly toxic long after it is emitted from a smokestack. Thus, the effects of the mercury the kiln emits in the two years between September 2013 and September 2015 will continue for a long time.

9. I am very concerned about emissions from the Cemex plant's kiln. Living as close to it as I do, and spending as much time outside in the area as I do, I am concerned that I breathe in what the plant puts out. What I breathe in affects my health. I know people who've died out here with respiratory illnesses, and I know that particulate matter pollution is especially dangerous for seniors. My health is also affected by the pollutants that deposit on the ground and that get into the soil I touch and the food I eat. We know what particulates and lead and mercury do—they are dangerous for people. I strongly believe that we need to have the strongest standards for those emissions, and that cement plants need to come into compliance with them as soon as possible.

10. I am also concerned about the effect of the emissions on my 8-year-old grandson. He works with me on my garden, and he lives in Lyons, where a lot of the heavy metals from the plant may wind up. I know that the pollution the plant emits is especially bad for developing kids like him. He's one reason I've worked so hard to get the Cemex Lyons plant to clean up and come into compliance with federal standards. The longer the kiln emits more dangerous pollutants, the worse for me and for my grandson.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this 10 day of April, 2013.

Richard Cargill

Richard Cargill

DECLARATION OF KATHRYN TILSON

1. I am a member of the Sierra Club, and have been continuously since 2011.

2. My husband and I live in Knoxville, Tennessee, about a mile and a quarter from the Cemex cement plant along the Holston River. We are so close that we can feel blasting or other large earth-moving work on the plant's grounds. We have lived in our home since 1991.

3. The plant is very visible from I-40 at the exit to our neighborhood. We drive past it regularly.

4. I am aware that EPA published a rule in 2013 that weakens the particulate matter standard for cement plants and gives them two more years than it gave them in 2010 to come into compliance with the standards it published in 2010 and weakened in 2013.

5. We have a lot of air pollution problems in Knoxville. We are at the foothills of the Great Smoky Mountains, and we also get a lot of weather inversions, which trap air pollution in Knoxville. In summer in particular, we have a lot of warnings about bad air quality. I am aware that Knoxville is designated nonattainment for fine particulate matter pollution. My husband and I have allergies that cause difficulty breathing.

6. I'm concerned about the effects of pollution on me. Breathing is obviously an important part of my life. I am aware that mercury is a deadly neurotoxin. I am also aware that soot pollution can kill. And I am aware from published reports that soot pollution is harmful to plants and ecosystems, especially those near cement plants.

7. I regularly spend time outside in my neighborhood. We have a nice, big yard, about 1.5 acres, with blueberries, raspberries, and pears. My husband and I have also

been planting a lot of trees in our yard over the last several years, and we regularly mulch or otherwise tend to them. We have a birch, a cedar, a white oak, a magnolia, dogwoods, pears, and white pines. I also dry my laundry on clotheslines in our yard, so am often outside dealing with that.

8. We also walk and bike regularly in the neighborhood.

9. Because of our proximity to the Holston River and its tributary Loves Creek, the area has a lot of green and attracts a lot of wildlife. There are coyotes, opossums, and turkeys right around our house, for example. I also love birds and bird-watching. We have birdfeeders in our yard, including one specifically for finches. We have titmice, cardinals, blue jays, golden finches, and house finches.

10. We enjoy eating the fruit we grow ourselves, and I am looking forward to returning to vegetable gardening, too.

11. I am aware from published reports and information on the Cemex plant's emissions that the plant will have to clean up its emissions to come into compliance with EPA's mercury and particulate matter standards. But because of the 2-year delay, the plant will be allowed to emit more of these dangerous pollutants for longer than it otherwise would.

12. I am aware that mercury remains in the environment long after it is emitted from a smokestack or other source. So, the longer the Cemex plant is allowed to emit high levels of mercury, the more mercury there will be in the area around me, effectively permanently.

13. The air I breathe affects my health. When I am outside, I breathe the air. By breathing, I am exposed to air pollutants, including particulate matter and hazardous air pollutants like mercury, emitted by the Cemex plant. These pollutants are dangerous. The more of them in the air I breathe, the greater the danger. My exposure to pollutants cannot be undone. And if Cemex is allowed to emit more of them for longer, the more dangerous for me. I am concerned about the impacts of the dirty air on me. Further, these pollutants are harmful for the ecosystem around me, including the vegetation in my yard, like the fruit we grow and eat. I am also concerned about the impacts of the pollution on the wildlife in the area and the birds that I enjoy watching in my yard.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this 8th day of April, 2013.

Kathryn Tilson

Kathryn Tilson

DECLARATION OF JANE WILLIAMS

1. I am a member of the Sierra Club, and have been since 1997.

2. I am a member of the Sierra Club's Clean Air Team, which is responsible for air toxics litigation, air toxics policy, and providing direct support to communities facing air toxics problems.

3. I also am the executive director of California Communities Against Toxics, an environmental justice network in California and an active member of Desert Citizens Against Pollution, a nonprofit environmental health group that works on desert pollution issues.

4. Since 1992, I have worked on behalf of Desert Citizens Against Pollution to improve efforts by EPA to control and reduce emissions of air pollutants from cement kilns in California. Because I am aware that cement kilns emit vast quantities of air pollutants, I have worked on behalf of Desert Citizens Against Pollution for 17 years specifically to ensure that federal regulations contain provisions limiting toxic pollution from cement kilns. In 2010, Desert Citizens Against Pollution intervened to defend EPA's 2010 rule that finally established lawful limits on toxic air pollution from cement kilns. *See* 75 Fed. Reg. 54,970 (Sept. 9, 2010).

5. My family and I live on our ranch in Rosamond, CA.

6. Our ranch in Rosamond is approximately 12 miles from the CalPortland cement kiln in Mojave, 20 miles from the Lehigh cement kiln in Tehachapi, and 25 miles from the National Cement Company cement kiln in Gorman/Lebec. I am aware from published reports and EPA documents that all these kilns will almost certainly have to take action to come into compliance with the standards EPA established in 2010.

7. EPA estimates that the Tehachepi kiln has very high mercury emissions: 1,690 lb/million tons clinker. EPA-HQ-OAR-2002-0051-3480 at 14. The kiln owner itself reported that

the Tehachepi kiln emitted over 1,349 pounds of mercury in 2011, and that over the last 12 years, it has averaged over 1,489 pounds per year. *See* Ex. A (excerpted from http://iaspub.epa.gov/triexplorer/facility_data?tri_facility_id=93561CLVRS13573&tri=TRIQ1). Once the kiln comes into compliance with the standard (55 lb/million tons clinker), EPA estimates its mercury emissions will shrink by 1,750 pounds per year, to about 35 pounds per year. EPA-HQ-OAR-2002-0051-3480 at 14. I am also aware from a published report that Lehigh plans to install an activated carbon injection system that would provide some control of mercury emissions (though not necessarily down to the level of the standard). http://www.tehachapinews.com/news/local/x59956471/Lehigh-Cement-system-will-reduce-mercury.

8. Further, I regularly see kiln upsets at the Tehachapi kiln. I drive by it a couple times a month, and roughly every three times I drive by I see visible emissions. During normal operations, emissions are not supposed to be visible. During upsets, I see a giant cloud of light grey smoke. There is a nasty smell, like something is burning; it is acrid. My throat gets really dry. If I am too close, my eyes start to water. If I drive by the kiln and see that there is an upset, I do not engage in activities outdoors near my home.

9. Similarly, EPA estimates show that the Mojave kiln emits more particulate matter (and non-mercury metals, for which particulate matter is EPA's surrogate) than would be allowed under the 2010 PM standard or the 2013 PM standard. I requested and reviewed stack test data for this kiln and am aware that it can and does emit more PM than would be allowed under either PM standard. Further, EPA's estimate of the Mojave kiln's PM emissions—0.08 lb/ton—is higher than the levels that would be allowed by either the 2010 rule or the 2013 rule. EPA-HQ-OAR-2002-0051-3480 at 14.

10. Further, emissions tests show that the Mojave kiln emits more than is allowed by the hydrochloric acid gas ("HCl") standard—it emits above 55 ppmvd (corrected to 7% oxygen). EPA-HQ-OAR-2002-0051-3468. The HCl standard is 3 ppmvd (corrected to 7% oxygen). 40 C.F.R. § 63.1343 tbl.1. Once the kiln brings its emissions under the HCl standard, its annual emissions will drop from 391.92 tons/year to 0.39 tons/year. EPA-HQ-OAR-2002-0051-3480 at 14, 18.

11. In addition, EPA estimates that the Mojave kiln would have to reduce its mercury emissions to meet the mercury standard in the 2013 rule. It emits, according to EPA, 68.65 lb/million tons clinker. EPA-HQ-OAR-2002-0051-3480 at 14. The standard is 55 lb/million tons of clinker. Once the kiln comes into compliance with the mercury standard, EPA estimates its mercury emissions will shrink by 102 pounds per year, to about 2 pounds per year. EPA-HQ-OAR-2002-0051-3480 at 14.

12. I am aware that the Mojave kiln is subject to a consent decree that required it to install certain pollution control equipment by February 2013, and although it may curb some acid gas emissions (though not necessarily down to the level of the standard), none of that equipment controls particulate matter emissions,. *See* Consent Decree ¶¶ 9, 13 tbl.1, *in United States v. CalPortland Co.*, No. 11-cv-2064 (E.D. Cal. Feb. 10, 2012); *see also id.* ¶¶ 6(v), 83 (defining "lime injection system," or "LIS," and establishing "effective date" as date of entry of consent decree).

13. EPA also estimates that the Gorman kiln does not comply with the mercury standard in the 2010 rule, emitting over 110 lb/million tons clinker. EPA-HQ-OAR-2002-0051-3480 at 14. The kiln owner itself reported that the Gorman kiln emitted 74 pounds of mercury in 2011, and that over the last 12 years (not counting 2009, for which it submitted no information),

it has averaged over 66 pounds per year. *See* Ex. A (excerpted from http://iaspub.epa.gov/triexplorer/facility_data?tri_facility_id=93243NTNLCSTATE&tri=TRIQ1.

14. I am aware that EPA published a rule in 2013 that weakens the particulate matter standard and gives cement kilns until September 2015 to come into compliance with the standards it published in 2010 and weakened in 2013. 78 Fed. Reg. 10,006, 10,053 (Feb. 12, 2013) (codified at 40 C.F.R. § 63.1351(c)). In the 2010 rule, EPA gave kilns until September 2013 to come into compliance with the standards. 75 Fed. Reg. at 55,063 (codified at 40 C.F.R. § 63.1351(b)).

15. Every day I can, I spend a significant amount of time outside. I walk outside for at least thirty minutes every day during the week. My family and I spend significant time outdoors in and around my home/ranch in Rosamond, CA, where we ride horses, ride bikes, swim, hike, and recreate outdoors. We can see the Mojave plant's smokestack from our ranch, and the prevailing winds blow strongly from the plant to our home. (There are many wind farms already around me, and more proposed.) When I am outside, I breathe the air. When my family is outside, they breathe the air.

16. One of my children, who is 12 years old, and my nephew who is 13 years old are often outdoors with me breathing outdoor air. My son and nephew are more susceptible to air pollution because they breathe more air per pound of body weight than adults, and their bodies are still developing. As a result, they have a greater sensitivity and are more at risk to air pollution than the population in general.

17. By breathing, my family and I are exposed to air pollutants, including particulate matter and hazardous air pollutants, emitted by cement kilns operating in the

Gorman/Mojave/Rosamond area. I have a heart murmur and have been told to avoid strenuous activities on bad air days.

18. I am aware that hazardous air pollutants can be transported great distances by air currents. Therefore, by breathing, my family and I also are exposed to hazardous air pollutants emitted by sources that operate outside the immediate area of my residence. These other sources also contribute to my family's cumulative exposure to persistent, bioaccumulative toxins.

19. I am aware that hazardous air pollutants such as mercury are deposited on water and soil, where they persist for long periods of time and bioaccumulate in wildlife and livestock. By eating fish, meat, and dairy products, my family and I are exposed to hazardous air pollutants emitted by sources in the Gorman/Mojave/Rosamond area and also to hazardous air pollutants emitted elsewhere and transported to areas where the food we eat is raised or caught. I am a vegetarian due to health concerns about, among other things, bioaccumulation of pollutants. If it were safe to eat local fish, I would like to eat them. My son, nephew, and I go fishing about half a dozen times a year at Bryce Lake, but we have to throw the fish back because there is a fish consumption warning there due to mercury. The mercury contamination in the lake diminishes my enjoyment of fishing. And, if it were safe to eat the fish, we would go more often (and eat them, too).

20. My family and I are deeply concerned about the damage that is being done and will be done by emissions from the three cement plants near us and other cement plants to our area's parks and our ranch land, to the rivers and streams that flow through them, and to the plant and animal species that inhabit these water bodies and lands. In particular, we are concerned that persistent and bioaccumulative pollutants, such as mercury and cadmium, contaminate the air, water, wildlife, and food sources on our property and in the community where we live and

recreate. In addition, I am aware that particulate matter that falls to earth can harm vegetation and ecosystems, particularly near sources like cement kilns. The pollution deposited on our land diminishes our enjoyment of recreational activities there.

21. Because mercury and other persistent and bioaccumulative pollutants persist in the environment, any of them that are emitted into the air and fall back to the ground stay in the environment without breaking down. Thus, it is difficult if not impossible to take the emitted mercury (and other similar toxins) back out of the environment once they come out of a kiln's smoke stack. Because EPA has given kilns two extra years to reduce their emissions of these pollutants to the legally allowed levels, plants will be able to—and will—emit more of these pollutants than they otherwise would. The mercury and other persistent bioaccumulative toxics emitted during the two-year compliance date delay thus irreversibly damage the natural world around me that I enjoy. They prevent me from undertaking activities I otherwise would enjoy, and diminish my enjoyment of activities that I do engage in.

22. Based on the sources indicated, I am aware of the following:

a. Portland cement kilns emit, among other things, mercury, cadmium, lead, total hydrocarbons, polycyclic organic matter (POM), hydrochloric acid, and particulate matter. 75 Fed. Reg. 54,970, 54,970 (Sept. 9, 2010); 63 Fed. Reg. 14,182, 14,183 (Mar. 24, 1998).

b. Exposure to these pollutants can cause adverse health effects including cancer, liver disease, reproductive disorders, immune disorders, respiratory disease, asthma attacks, heart problems, kidney disease, and death. 75 Fed. Reg. at 54,979; 63 Fed. Reg. at 14,184-85.

c. Emissions from Portland cement kilns are preferentially deposited on land and water bodies located near their source, and are also transported over great distances. EPA, Deposition of Air Pollutants to the Great Waters, First Report to Congress (1994) ("Great Waters Report"), Executive Summary at x-xi.

d. Some emissions from Portland cement kilns, including mercury, cadmium, and lead, persist in soil and water for long periods of time. In addition, they are absorbed by plants and bioaccumulate in fish and animals. Great Waters Report, Executive Summary at ix-x.

e. Mercury inhalation can affect the central nervous system, kidneys, and heart. CalEPA, OEHHA, *Technical Support Document For the Derivation of Noncancer Reference Exposure Levels* app. D, at Mercury-7 to -8.

f. Particulate matter likely harms vegetation and ecosystems, especially near cement kilns. 78 Fed. Reg. 3086, 3203 (Jan. 15, 2013).

23. My family and I, and our property, are exposed to pollutants emitted by the Tehachapi, Mojave, and Gorman plants, including mercury, cadmium, total hydrocarbons, hydrochloric acid, and particulate matter. These emissions enter our bodies when we breathe. We are also exposed to these substances by drinking water, eating food, and touching water and soil. Emissions from these plants threaten our health, cause us concern about their impact on our health and property, and prevent me from engaging in activities I otherwise would engage in, like jogging. They also cause irreparable damage to the natural environment around me, diminishing my enjoyment of it.

24. If EPA's 2013 rule remains effective while this litigation is pending, there will be more toxic pollution released into the community where my family and I live, work, and recreate

than there would be in its absence. My family and I will be forced to breathe in more hazardous pollution than we otherwise would, and consequently will face greater danger to our health. If the rule remains in effect, the damage to our ability to enjoy daily life and recreational activities on our ranch and in the surrounding community will be prolonged, depriving us permanently of the ability to fully enjoy our lives here during that time. If the rule were stayed, my concerns about its impacts on our health would be lessened, and my family's health and enjoyment of our activities would be heightened.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this 30th day of March, 2013.

Jane Williams

Jane Williams

Exhibit A

Data Source: 2011 Data Update as of March 2013

Facility name	TRI ID	Address	City	County	State	Zip Code	Year	Chemical	Stack Air
LEHIGH SOUTHWEST CEMENT CO	93561CLVRS13573	13573 TEHACHAPI BLVD	TEHACHAPI	KERN	CA	'93561'	2000	MERCURY COMPOUNDS	2580
LEHIGH SOUTHWEST CEMENT CO	93561CLVRS13573	13573 TEHACHAPI BLVD	TEHACHAPI	KERN	CA	'93561'	2001	MERCURY COMPOUNDS	2547
LEHIGH SOUTHWEST CEMENT CO	93561CLVRS13573	13573 TEHACHAPI BLVD	TEHACHAPI	KERN	CA	'93561'	2002	MERCURY COMPOUNDS	2345.2
LEHIGH SOUTHWEST CEMENT CO	93561CLVRS13573	13573 TEHACHAPI BLVD	TEHACHAPI	KERN	CA	'93561'	2003	MERCURY COMPOUNDS	2594
LEHIGH SOUTHWEST CEMENT CO	93561CLVRS13573	13573 TEHACHAPI BLVD	TEHACHAPI	KERN	CA	'93561'	2004	MERCURY COMPOUNDS	2505.68
LEHIGH SOUTHWEST CEMENT CO	93561CLVRS13573	13573 TEHACHAPI BLVD	TEHACHAPI	KERN	CA	'93561'	2005	MERCURY COMPOUNDS	697.85
LEHIGH SOUTHWEST CEMENT CO	93561CLVRS13573	13573 TEHACHAPI BLVD	TEHACHAPI	KERN	CA	'93561'	2006	MERCURY COMPOUNDS	586.28
LEHIGH SOUTHWEST CEMENT CO	93561CLVRS13573	13573 TEHACHAPI BLVD	TEHACHAPI	KERN	CA	'93561'	2007	MERCURY COMPOUNDS	144.08
LEHIGH SOUTHWEST CEMENT CO	93561CLVRS13573	13573 TEHACHAPI BLVD	TEHACHAPI	KERN	CA	'93561'	2008	MERCURY COMPOUNDS	944.8
LEHIGH SOUTHWEST CEMENT CO	93561CLVRS13573	13573 TEHACHAPI BLVD	TEHACHAPI	KERN	CA	'93561'	2009	MERCURY COMPOUNDS	711.08
LEHIGH SOUTHWEST CEMENT CO	93561CLVRS13573	13573 TEHACHAPI BLVD	TEHACHAPI	KERN	CA	'93561'	2010	MERCURY COMPOUNDS	870.32
LEHIGH SOUTHWEST CEMENT CO	93561CLVRS13573	13573 TEHACHAPI BLVD	TEHACHAPI	KERN	CA	'93561'	2011	MERCURY COMPOUNDS	1349.77
								Average:	1489.67

Data Source: 2011 Data Update as of March 2013

Facility name	TRI ID	Address	City	County	State	Zip Code	Year	Chemical	Stack Air
NATIONAL CEMENT CO OF CALIFORNIA INC	93243NTNLCSTATE	5 MILES E OF I-5, OFF HWY 138	LEBEC	KERN	CA	'93243'	2000	MERCURY COMPOUNDS	144
NATIONAL CEMENT CO OF CALIFORNIA INC	93243NTNLCSTATE	5 MILES E OF I-5, OFF HWY 138	LEBEC	KERN	CA	'93243'	2001	MERCURY COMPOUNDS	138
NATIONAL CEMENT CO OF CALIFORNIA INC	93243NTNLCSTATE	5 MILES E OF I-5, OFF HWY 138	LEBEC	KERN	CA	'93243'	2002	MERCURY COMPOUNDS	42
NATIONAL CEMENT CO OF CALIFORNIA INC	93243NTNLCSTATE	5 MILES E OF I-5, OFF HWY 138	LEBEC	KERN	CA	'93243'	2003	MERCURY COMPOUNDS	8
NATIONAL CEMENT CO OF CALIFORNIA INC	93243NTNLCSTATE	5 MILES E OF I-5, OFF HWY 138	LEBEC	KERN	CA	'93243'	2004	MERCURY COMPOUNDS	76
NATIONAL CEMENT CO OF CALIFORNIA INC	93243NTNLCSTATE	5 MILES E OF I-5, OFF HWY 138	LEBEC	KERN	CA	'93243'	2005	MERCURY COMPOUNDS	70
NATIONAL CEMENT CO OF CALIFORNIA INC	93243NTNLCSTATE	5 MILES E OF I-5, OFF HWY 138	LEBEC	KERN	CA	'93243'	2006	MERCURY COMPOUNDS	59
NATIONAL CEMENT CO OF CALIFORNIA INC	93243NTNLCSTATE	5 MILES E OF I-5, OFF HWY 138	LEBEC	KERN	CA	'93243'	2007	MERCURY COMPOUNDS	55
NATIONAL CEMENT CO OF CALIFORNIA INC	93243NTNLCSTATE	5 MILES E OF I-5, OFF HWY 138	LEBEC	KERN	CA	'93243'	2008	MERCURY COMPOUNDS	55
NATIONAL CEMENT CO OF CALIFORNIA INC	93243NTNLCSTATE	5 MILES E OF I-5, OFF HWY 138	LEBEC	KERN	CA	'93243'	2010	MERCURY COMPOUNDS	6
NATIONAL CEMENT CO OF CALIFORNIA INC	93243NTNLCSTATE	5 MILES E OF I-5, OFF HWY 138	LEBEC	KERN	CA	'93243'	2011	MERCURY COMPOUNDS	78.4
								Average:	66.49

Note: All units for emissions are pounds.

DECLARATION OF BRENDA BIBEE

1. I am a member of Desert Citizens Against Pollution and have been for at least 10 years. I serve on its advisory council.

2. I am 72 years old. I live in Rosamond, California. My house is about 12 miles southwest of the CalPortland cement plant in Mojave. The wind often blows strongly from the plant toward my home. I have lived here for about 3 years. It's very windy here. When I moved, I got horses and other animals, like peacocks and a goat. I moved from San Pedro, CA, down by the Port of Los Angeles.

3. I have serious lung problems. I have had asthma since I was 4. I use inhalers usually twice a day, and more as needed, and am on medication (Singulair) and Advair for my asthma. I also have a nebulizer that I use to treat my asthma. In addition to the problems my asthma causes me, I also had to have part of my lung removed because of sarcoidosis.

4. Asthma is really hard to live with. Some days it's worse, and if I get tired or walk, it flares up. Then I can't walk far because I can't breathe. I stay out of the wind as much as I can. I take my medicines and try to breathe. I stay in my house quite a bit—sadly housebound. I'm working toward getting up on the horses, but I can't breathe well enough to get up on them. I would like to ride them—I used to enjoy riding—and I would like to be able to go outside more regularly.

5. I am aware that particulate matter is especially dangerous for older adults, like me, and those with lung conditions, like me. I am very concerned about the effects of pollutants including particulate matter on my health.

6. I am also aware that EPA published a rule in 2013 that delays by 2 years the deadline for cement plants to come into compliance with standards for pollutants including particulate matter.

7. If EPA's 2013 rule remains effective while this litigation is pending, there will be more pollution released into the community where I live and recreate than there would be in its absence. I will be forced to breathe in more dangerous pollution than I otherwise would, and consequently will face greater danger to my health. If the rule remains in effect, the damage to my ability to enjoy daily life and recreational activities in and around my home will be prolonged, depriving me permanently of the ability to fully enjoy my life here during that time. If the rule were stayed, my concerns about its impacts on my health and would be lessened, and my health and enjoyment of my activities would be heightened.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this 15th day of April, 2013.

Brenda Bibee

Brenda Bibee

DECLARATION OF REBECCA BORNHORST

I , Rebecca Bornhorst, hereby declare and state:

1. I am a member of Downwinders At Risk and have been for 18 years. Since 2010, I have been the chairperson of Downwinders At Risk's 501(c)(4).

2. In 2010, Desert Citizens Against Pollution intervened to defend EPA's 2010 rule that finally established lawful limits on toxic air pollution from cement kilns. *See* 75 Fed. Reg. 54,970 (Sept. 9, 2010).

3. I live in DeSoto, Texas, with my husband. We have two children, ages 26 and 29, who lived in DeSoto for 19 years. My daughter, who is 26, moved back home again in 2013. She has resumed hiking and biking in the area around Joe Pool Lake, and I am concerned that the poor air quality may cause her asthma to flare back up. My elderly father, sister and her family, nephews, and niece also live in the area.

4. The TXI Portland Cement Plant is near my home. It is about 10 miles away, and I pass near it whenever I drive down Highway 67. I drive by a few times a month. I try not to go that way because I don't want to get any closer to it.

5. In addition, the Ash Grove and Holcim cement plants are about 10 and 5 miles away, respectively. I am aware that EPA has categorized both as incinerators because of the fuels they use.

6. Prevailing winds blow from all these plants toward my home. I can see emissions from my neighborhood, and I have been concerned about emissions from these plants since about 1988. My daughter was a soccer player and she had exercise-induced asthma. She also has hormonal problems and I believe the pollutants she was exposed to in her early years are responsible.

7. I am aware that EPA published a rule in 2013 that weakens the particulate matter standard for cement plants and gives them until September 2015 to come into compliance with the standards it published in 2010 and weakened in 2013. 78 Fed. Reg. 10,006, 10,053 (Feb. 12, 2013) (codified at 40 C.F.R. § 63.1351(c)). In the 2010 rule, EPA gave kilns until September 2013 to come into compliance with the standards. 75 Fed. Reg. at 55,063 (codified at 40 C.F.R. § 63.1351(b)).

8. I am aware that EPA estimates that the TXI plant would have to reduce its mercury emissions to meet the mercury standard in the 2013 rule. It emits, according to EPA, 138.61 lb/million tons clinker. EPA-HQ-OAR-2002-0051-3480 at 16. The standard is 55 lb/million tons of clinker. Once the kiln comes into compliance with the mercury standard, EPA estimates its mercury emissions will shrink by 294 pounds per year, to about 6 pounds per year. EPA-HQ-OAR-2002-0051-3480 at 17.

9. In addition, EPA's estimate of the TXI plant's PM emissions—0.08 lb/ton clinker—is higher than the levels that would be allowed by either the 2010 or 2013 rule. EPA-HQ-OAR-2002-0051-3480 at 21.

10. My family and I regularly eat locally grown fruits and vegetables and grass-fed beef. I don't eat any local fish because of my concerns about mercury, but I would otherwise like to.

11. I have a small garden, but would be eating more fresh produce if I weren't so worried about toxics accumulated in the soil and vegetables.

12. We have 23 acres of land in DeSoto where we have campfires and picnics, walk our dog, and plant wildflowers. We also sail and camp in the area on Joe Pool Lake and Cedar Hill State Park. Our concerns about air pollution have affected all our outdoor activities. I am

aware that once mercury is deposited on land or in the water, it persists and bioaccumulates in wildlife. Because of the air pollution, including mercury, that comes from the cement plants in the area, I do not think it is safe to swim in the water at Joe Pool Lake, so I do not swim there, nor do I believe it is safe to eat fish from the lake, though I would eat it if it were safe. We simply have no choice but to use these outdoor areas – we cannot stay indoors.

13. I enjoy outdoor walking, hiking, and bicycling. I used to swim in Joe Pool Lake. I have sinus and allergy problems and would like to exercise more, but I consider it risky to be outdoors due to emissions from the plants near my home, including emissions of PM and mercury from the TXI plant.

14. I am aware of the following:

a. Portland cement kilns emit, among other things, mercury, cadmium, lead, total hydrocarbons, polycyclic organic matter (POM), hydrochloric acid, and particulate matter. 75 Fed. Reg. 54,970, 54,970 (Sept. 9, 2010); 63 Fed. Reg. 14,182, 14,183 (Mar. 24, 1998).

b. Exposure to these pollutants can cause adverse health effects including cancer, liver disease, reproductive disorders, immune disorders, respiratory disease, asthma attacks, heart problems, kidney disease, and death. 75 Fed. Reg. at 54,979; 63 Fed. Reg. at 14,184-85.

c. Emissions from Portland cement kilns are preferentially deposited on land and water bodies located near their source, and are also transported over great distances. EPA, Deposition of Air Pollutants to the Great Waters, First Report to Congress (1994) ("Great Waters Report"), Executive Summary at x-xi.

d. Some emissions from Portland cement kilns, including mercury, cadmium, and lead, persist in soil and water for long periods of time. In addition, they are absorbed by plants and bioaccumulate in fish and animals. Great Waters Report, Executive Summary at ix-x.

e. Mercury inhalation can affect the central nervous system, kidneys, and heart. CalEPA, OEHHA, *Technical Support Document For the Derivation of Noncancer Reference Exposure Levels* app. D, at Mercury-7 to -8.

f. Particulate matter likely harms vegetation and ecosystems, especially near cement kilns. 78 Fed. Reg. 3086, 3203 (Jan. 15, 2013).

g. The reduction in fine particulate pollution alone from the recent rulemaking is anticipated to save from 960 to 2,500 lives per year. 75 Fed. Reg. at 55,026 tbl.13. Reduction in or delay of the protections the 2010 rule provides would increase my exposure to fine particulate pollution and the harm that it causes.

15. My family and I are exposed to pollutants emitted by the TXI plant, including mercury, cadmium, total hydrocarbons, hydrochloric acid, and particulate matter, by breathing air, drinking water, eating food, and touching water and soil. Emissions from this plant, as well as the other cement manufacturers in the area, threaten our health, and cause us to limit or avoid activities that we otherwise would enjoy.

16. My family and I are also exposed to transported emissions from Portland cement kilns elsewhere in the country, especially emissions of mercury, cadmium, and lead, which persist in the environment, bioaccumulate in the food we eat, and can be transported great distances. Therefore, by breathing, my family and I also are exposed to hazardous air pollutants

emitted by sources that operate outside the immediate area of my residence. These other sources also contribute to my family's cumulative exposure to persistent, bioaccumulative toxins.

17. The longer the emissions go on, and the higher the levels of emissions, the more dangerous pollution we are exposed to. And the more exposed we are to it, the longer we must refrain from activities we otherwise would enjoy, and the greater the threat to our health.

18. My family and I are deeply concerned about the damage that is being done and will be done by toxic emissions from the TXI plant and other cement plants to our land in DeSoto, and to Joe Pool Lake and Cedar Hill State Park, to the rivers and streams in these areas, and to the plant and animal species that inhabit the water bodies and park. In particular, we are concerned that persistent and bioaccumulative pollutants, such as mercury and cadmium, contaminate the air, water, wildlife, and food sources on our property and in the community where we live and recreate. The pollution caused by these cement plants diminishes our enjoyment of recreational activities in DeSoto, and to Joe Pool Lake and Cedar Hill State Park.

19. Mercury and other persistent and bioaccumulative pollutants persist in the environment, meaning that those that are emitted into the air and fall back to earth stay in the environment without breaking down. Thus, once mercury (and other similar toxins) come out of a plant's smoke stack, they are effectively in the environment to stay. Because EPA has given kilns two extra years to reduce their emissions of these pollutants to the legally allowed levels, plants will be able to—and will—emit more of these pollutants than they otherwise would. The mercury and other persistent bioaccumulative toxics emitted during the two-year compliance date delay thus irreversibly damage the natural world around me that I enjoy. They prevent me from undertaking activities I otherwise would enjoy, like swimming in Joe Pool Lake, and

diminish my enjoyment of activities that I do engage in, like sailing, camping, walking, hiking, and biking.

20. If EPA's 2013 rule remains effective while this litigation is pending, there will be more toxic pollution released into the community where my family and I live, work, and recreate than there would be in its absence. My family and I will be forced to breathe in more hazardous pollution than we otherwise would, and consequently will face greater danger to our health. If the rule remains in effect, the damage to our ability to enjoy daily life and recreational activities at our home and in the surrounding community will be prolonged, depriving us permanently of the ability to fully enjoy our lives here during that time. If the rule were stayed, my concerns about its impacts on our health would be lessened, and my family's health and enjoyment of our activities would be heightened.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this 14 day of April, 2013.

Rebecca A. Bornhorst

Rebecca Bornhorst

DECLARATION OF SUE POPE

1. I am one of the founders of Downwinders At Risk and am still a member, as I have been since it was organized in 1993 and 1994.

2. I live in Midlothian, Texas. I am 72 years old.

3. I live on land that has been in my family for about 100 years. It is about 70 acres. On it, I have about 40 head of cattle (the number varies) and 2 horses. I know I should move, but all my memories of my deceased only child and husband of fifty two years are here. This land was also my grandfather's.

4. My property is about 7.5 miles from the TXI cement plant in Midlothian. I am downwind of it.

5. It is also about 4 miles from the Ash Grove plant and under a mile from the Holcim cement plant property.

6. My family and I have long had to deal with the emissions from the plants in the area. In the 1990s, our cattle and horses started suffering birth deformities, and in 1997, I had to quit breeding horses. In the mid 1990's, tests showed that my husband had high levels of cadmium. He developed prostate cancer and after four bouts with it, he died in January 2011. Everyone one around got sick when the kilns started.

7. I have developed serious heart and lung problems. I am on oxygen continually and regularly go to a lung doctor. I have only about 1/3rd of my lung function remaining. I have asthma; but because of my heart problems, I cannot regularly take my asthma medication, which raises my blood pressure.

8. I am aware from EPA documents that particulate matter is especially dangerous for older adults, like myself, and those with heart and/or lung conditions. I am very concerned

about the effects of particulate matter on my health. When I sense odors which are not natural or normal, and the wind direction is towards the farm, I must go inside to try and prevent attacks. Just recently, I was outside planting flowers when a concerned friend called to tell me that she smelled an abnormal odor coming from the closest plant and suggested I go indoors. We can see the stacks of one of the plants from our property and we are downwind of all particulate sources in Midlothian the greater part of the time.

9. I am also aware from my work on fighting against the pollution that affects my community that particulate matter and other pollutants that cement plants emit, like mercury and heavy metals, harm the environment. I live in the country. I see what's so important about the environment. <u>What the Lord has given us is too precious to destroy</u>. I just feel real strongly about it. When the environment around me is harmed, it does damage to my property and it affects my enjoyment of my everyday life.

10. I had two little girls visit me with their aunt last fall. The air was bad—I could feel it. They both had asthma attacks while they were here. One had to go to the hospital later that night. They also live in the area. Two other children moved to the farm 8 years ago. They have developed learning disabilities that I am concerned are related to the cement plants in the area. I am also concerned that their continual respiratory problems are related to the plants' emissions.

11. I am aware that EPA published a rule in 2013 that weakens the particulate matter standard for cement plants and gives them until September 2015 to come into compliance with the standards it published in 2010 and weakened in 2013. 78 Fed. Reg. 10,006, 10,053 (Feb. 12, 2013) (codified at 40 C.F.R. § 63.1351(c)). In the 2010 rule, EPA gave kilns until September 2013 to come into compliance with the standards. 78 Fed. Reg. at 10,022.

12. If EPA's 2013 rule remains effective while this litigation is pending, there will be more toxic pollution released into the community where my family and I live, work, and recreate than there would be in its absence. I will be forced to breathe in more dangerous pollution than I otherwise would, and consequently will face greater danger to my health. If the rule remains in effect, the damage to my ability to enjoy daily life and recreational activities, in and around my home, will be prolonged; depriving me permanently of the ability to fully enjoy my life here during that time. My concerns about damage to my property and my livestock would also be lessened. If the rule were stayed, my concerns about its impacts on my health and my land would be lessened, and my health and enjoyment of my activities would be heightened.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this 15th day of April, 2013.

Sue Pope

Sue Pope

DECLARATION OF ANN SEARS

1. I am a member of Downwinders At Risk, as I have been since the 1990s.

2. I live on Cement Valley Road, in Midlothian, Texas. I am 78 years old.

3. My home sits is about a mile from the TXI cement plant in Midlothian. I moved here in 1982. I can sometimes smell the plant. It's a bad smell, a little like rotten eggs.

4. I have had heart surgery because of a heart murmur. Sometimes, I find it hard to catch my breath.

5. I am aware that particulate matter is especially dangerous for older adults and those with heart or lung conditions, like me. I am very concerned about the effects of particulate matter on my health. I am 78 years old, and I'd like to live a little longer.

6. I've got about 10 acres, and I like spending time outside on it. I especially like sitting out on my porch swing. But when there's the bad smell from the plant, I stay inside.

7. I have double-paned windows and I don't open them based on my concerns about the emissions from the TXI plant.

8. I want the cleanest air possible. Health and quality of life are very important to me. We've put up with bad air here for a long time, and I believe the cement companies need to follow the law.

9. I am aware that EPA put out a rule in 2013 that gave cement plants an extra two years to bring their emissions of pollutants including particulate matter into compliance with federal standards.

10. If EPA's 2013 rule remains effective while this litigation is pending, there will be more toxic pollution released into the community where I live and recreate than there would be in its absence. I will be forced to breathe in more dangerous pollution than I otherwise would,

and consequently will face greater danger to my health. If the rule remains in effect, the damage to my ability to enjoy daily life and recreational activities in and around my home will be prolonged, depriving me permanently of the ability to fully enjoy my life here during that time. If the rule were stayed, my concerns about its impacts on my health would be lessened, and my health and enjoyment of my activities would be heightened.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this 16 day of April, 2013.

Ann Sears

Ann Sears

DECLARATION OF JENNIFER SWEARINGEN

1. I am a member of Montanans Against Toxic Burning and have been since about 1992. I am a board member and have been for about 8 years.

2. I am married and have two grown sons, age 26 and 28.

3. I live in Bozeman, Montana, which is downwind from Holcim Inc.'s Trident Plant, a wet-process Portland cement kiln.

4. This cement kiln is located at the headwaters of the Missouri River, adjacent to historic Headwaters State Park. The Park encompasses the wetlands and riparian habitat that the confluence of the three headwater rivers to the Missouri creates, which support nesting sites for bald eagles, great blue herons, osprey, and many other bird species. Two of these rivers, the Madison and Gallatin, have been recognized by the state as high-quality Blue Ribbon trout streams.

5. For the last 12 years, I have become increasingly concerned with the emissions from this plant with every passing year. In 2010, Montanans Against Toxic Burning intervened to defend EPA's 2010 rule that finally established lawful limits on toxic air pollution from cement kilns. *See* 75 Fed. Reg. 54,970 (Sept. 9, 2010).

6. The outdated wet-process Trident kiln, which burns large amounts of petroleum coke, coal, and lead-smelter slag, is in the same valley as my house, about 20 miles away. In the winter, weather inversions are very common in our valley and often last for several days. It's like there is a lid on the valley. Then, kiln emissions cause big buildups of pollutants, including high levels of particulate matter. I cannot see any mountains (which I can see easily on a clear day), and the air is hazy and tinged with brown. The haze especially hugs the headwaters rivers during inversions and at night.

7. I have scarred lung tissue from a bad case of pneumonia and flu. When the air gets bad in our valley, I can really feel it—I find it harder to breathe and difficult to do any strenuous activity. There have been times when the pollution has been so bad that the air has left a metallic taste in my mouth.

8. From EPA documents and my work on this kiln, I am aware that the Trident kiln will have to take action to come into compliance with the standards EPA established in 2010. The kiln's only control for particulate matter is an electrostatic precipitator. EPA estimates that it emitted PM10 at a rate of 0.4 lb/ton clinker in 2008—10 times the 2010 standard and well over the 2013 standard. EPA-HQ-OAR-2002-0051-3480 at 19. Its current operating permit allows it to emit PM at a rate up to 0.77 lb/ton clinker. http://www.deq.mt.gov/airquality/ARMpermits/OP0982-02FNL.pdf at 15.

9. EPA also estimates that the kiln releases over 111 pounds of mercury per million tons clinker, which is more than twice the standard. EPA-HQ-OAR-2002-0051-3480 at 15. In a health risk assessment from 2006, the company estimated its Trident kiln emitted 102 lb/year of mercury. EPA estimates that, as of 2008, it emitted 34.39 lb/year, and that after the kiln comes into compliance, its mercury emissions will drop by 31 lb/year, to under 3.5 lb/year.

10. Further, the Trident kiln experiences frequent upsets and malfunctions. I have examined malfunction reports that the Trident kiln has submitted over at least the last 12 years to the Montana Department of Environmental Quality ("DEQ"). During these malfunctions, pollutants are spewed into the air uncontrolled. Sometimes these upsets last for more than 24 hours. I have driven closer to the kiln and smelled a rotten egg odor so strong that it got in even with the windows rolled up. When I called DEQ about the conditions, they told me that there had been a serious malfunction.

11. In January 2010, the Trident kiln suffered an upset that lasted about 22 hours over two days and caused 16 exceedances of the opacity standard. (The self-reported Facility Upset Report that Trident submitted to DEQ is attached.) During the worst of these, which lasted over 8 hours, the opacity level averaged over 75% and reached a high of 93.65%. The report said that the "Specific Cause of Malfunction" was that the kiln went into "shutdown due to excess ring build-up" in the kiln.

12. I am aware from reading hundreds of malfunction reports for the Trident kiln that during upsets and during shutdown, the electrostatic precipitator is usually turned off, meaning that PM emissions go uncontrolled. If the kiln had a baghouse, it could provide control of PM emissions during these events.

13. I am aware that EPA published a rule in 2013 that weakens the particulate matter standard and gives cement kilns until September 2015 to come into compliance with the standards it published in 2010 and weakened in 2013. 78 Fed. Reg. 10,006, 10,053 (Feb. 12, 2013) (codified at 40 C.F.R. § 63.1351(c)). In the 2010 rule, EPA gave kilns until September 2013 to come into compliance with the standards. 75 Fed. Reg. at 55,063 (codified at 40 C.F.R. § 63.1351(b)).

14. I am aware from reading Portland Cement Association submissions to the docket for this rule that under the 2010 rule, the Trident kiln would have had to replace or supplement its electrostatic precipitator with a baghouse. EPA-HQ-OAR-2011-0817-0505 at 8. ("ESPs cannot achieve the 0.04 lbs/ton clinker limit." (emphasis in original)). But the facility will be able to reduce its emissions less to meet the weaker standard, and may not even need to install a baghouse on the kiln. *See* PCA, *The Impact of a Change in the Cement NESHAP PM Limit On Compliance Strategies and Schedules* 2-3 (EPA-HQ-OAR-2011-0817-0154, Apr. 9, 2012).

15. I spend a lot of time outdoors. I enjoy walking, hiking, biking, skiing, fishing, gardening, bird watching, and canoeing in the area. My family practices catch and release fishing, in part because of our concerns about the safety of eating fish, and I am concerned about the health of the local fish population. I would like to be able to eat some of the fish we catch, but refrain because of my concerns. I am also very concerned about the birds and wildlife, including bald eagles, osprey, and herons, that I enjoy watching and that subsist on the local fish.

16. We eat a lot of local food, including local grass-fed lamb and beef, abundant amounts of local produce, and milk products from the local dairy herds. We also grow some of our own produce. We really value clean food and water, and emissions from the kiln cause us significant concern for our health due to the impacts the emissions can have on the local food and water.

17. My family and I are concerned about the damage that is being done and will be done to the area, the water bodies in it, and the plant and animal species that inhabit these water bodies and surrounding area by emissions from the Trident Plant and other cement plants. In particular, we are concerned that persistent and bioaccumulative pollutants, such as mercury and cadmium, contaminate the air, water, wildlife and food sources on our property and in the area where we live and recreate. In addition, I am aware that particulate matter that falls to earth can harm vegetation and ecosystems, particularly near sources like cement kilns. The pollution from the Trident Plant diminishes our enjoyment of the recreational activities in which we engage, including hiking and skiing, which we curtail when emissions are prominent.

18. Because mercury and other persistent and bioaccumulative pollutants persist in the environment, any of them that are emitted into the air and fall back to the ground stay in the environment without breaking down. Thus, it is difficult if not impossible to take the emitted

mercury (and other similar toxins) back out of the environment once they come out of a kiln's smoke stack. Because EPA has given kilns two extra years to reduce their emissions of these pollutants to the legally allowed levels, plants will be able to—and will—emit more of these pollutants than they otherwise would. The mercury and other persistent bioaccumulative toxics emitted during the two-year compliance date delay thus irreversibly damage the natural world around me that I enjoy. They prevent me from undertaking activities I otherwise would enjoy, and diminish my enjoyment of activities that I do engage in.

19. Based on the sources indicated, I am aware of the following:

a. Portland cement kilns emit, among other things, mercury, cadmium, lead, total hydrocarbons, polycyclic organic matter (POM), hydrochloric acid, and particulate matter. 75 Fed. Reg. 54,970, 54,970 (Sept. 9, 2010); 63 Fed. Reg. 14,182, 14,183 (Mar. 24, 1998).

b. Exposure to these pollutants can cause adverse health effects including cancer, liver disease, reproductive disorders, immune disorders, respiratory disease, asthma attacks, bronchitis, heart problems, kidney disease, and death. 75 Fed. Reg. at 54,979; 63 Fed. Reg. at 14,184-85.

c. Emissions from Portland cement kilns are preferentially deposited on land and water bodies located near their source, and are also transported over great distances. EPA, Deposition of Air Pollutants to the Great Waters, First Report to Congress (1994) ("Great Waters Report"), Executive Summary at x-xi.

d. Some emissions from Portland cement kilns, including mercury, cadmium, and lead, persist in soil and water for long periods of time. In addition, they are absorbed by plants and bioaccumulate in fish and animals. Great Waters Report, Executive Summary at ix-x.

e. Mercury inhalation can affect the central nervous system, kidneys, and heart. CalEPA, OEHHA, *Technical Support Document For the Derivation of Noncancer Reference Exposure Levels* app. D, at Mercury-7 to -8.

f. Particulate matter likely harms vegetation and ecosystems, especially near cement kilns. 78 Fed. Reg. 3086, 3203 (Jan. 15, 2013).

20. My family and I are exposed to pollutants emitted by the Trident Plant, including mercury, cadmium, lead, total hydrocarbons, and particulate matter, by breathing air, drinking water, eating food, and touching water and soil. Emissions from this plant enter our bodies, threaten our health, and cause us to limit or avoid activities that we otherwise would enjoy. They also cause irreparable damage to the natural environment around me, diminishing my enjoyment of it.

21. My family and I are also exposed to transported emissions from Portland cement kilns elsewhere in the country, especially emissions of mercury, cadmium, and lead, which persist in the environment, bioaccumulate in the food we eat, and can be transported great distances. Therefore, emissions from Portland cement kilns elsewhere in the country also threaten our health.

22. If EPA's 2013 rule remains effective while this litigation is pending, there will be more toxic pollution released into the community where my family and I live, work, and recreate than there would be in its absence. The Trident kiln will not have to reduce its PM emissions for two more years, and it may be able to continue using its electrostatic precipitator without having to add a baghouse to meet the weaker standard. As a result of the delay and the possible

continued use of the electrostatic precipitator, PM emissions, especially during upsets, will be higher than they otherwise would be. And mercury emissions will also be higher than they otherwise would be. Thus, my family and I will be forced to breathe in more dangerous pollution than we otherwise would, and consequently will face greater danger to our health. If the rule remains in effect, the damage to our ability to enjoy daily life and recreational activities in the surrounding community will be prolonged, depriving us permanently of the ability to fully enjoy our lives here during that time. If the rule were stayed, my concerns about its impacts on our health would be lessened, and my family's health and enjoyment of our activities, like hiking, walking, and skiing, would be heightened.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this 20th day of March, 2013.

Jennifer Swearingen

Jennifer Swearingen

DEPARTMENT OF ENVIRONMENTAL QUALITY
Permitting and Compliance Division
Air Resources Management Bureau
Facility Upset Report

1520 E. 6th Ave.
P.O. Box 200901
Helena, MT 59620-0901
(406) 444-3490
Fax (406) 444-1499

MT DEQ
301 West Alder Street
Missoula, MT 59802
(406) 258-4907
Fax (406) 258-4781

Report Date: January 28, 2010

Select the most appropriate categories:

Start-up (Production): X

Shutdown (Production): X

Start-up (repair/maintenance): N/A

Shutdown (repair/maintenance): N/A

Exceedance:

Malfunction: N/A

If reporting under ARM 17.8.110 (Malfunction Rule), please complete this entire form. ***(Additional information may be needed).***

DEQ must be notified promptly by telephone/fax, whenever a malfunction occurs that is expected to create excess emissions in excess of any applicable emission limitation, or to continue for a period greater than 4 hours. Within 1 week after a malfunction has been corrected, the owner or operator must submit a written report to the department that includes this primary information. See ARM 17.8.110 for specific instructions. The malfunction rule section is referenced in parentheses.

Company: Holcim (US) Inc. – Trident Plant

Person Reporting: Greg Gannon, Environmental Manager

Date and time of DEQ notification (2): 01/26/2010 09:54
01/26/2010 13:49

Contact: Faxed to 406.444.1499 &
Faxed to 406.258.4781

Date and time event occurred:

Begin (2c): Please see table below.

End: Please see table below.

Total Time: Please see table below.

EXCURSION				**Measured**	
	START	**END**	**#-6**	**OPACITY (%)**	
DATE	**TIME**	**TIME**	**MIN**	**AVG.**	**MAX.**
01/25/10	09:18	10:18	10	39.69	59.78
01/25/10	10:42	10:48	1	38.86	38.86
01/25/10	11:30	11:42	2	28.30	34.36
01/25/10	11:48	11:54	1	45.85	45.85
01/25/10	12:12	12:18	1	53.59	53.59
01/25/10	12:42	12:54	2	35.05	43.93
01/25/10	13:18	13:30	2	27.93	32.83
01/25/10	14:06	14:18	2	28.31	31.66
01/25/10	14:48	14:54	1	36.13	36.13
01/25/10	15:12	15:24	2	26.33	32.29
01/25/10	16:06	16:12	1	31.01	31.01
01/25/10	16:54	17:06	2	23.16	23.81
01/25/10 – 01/26/10	17:36	01:42	81	75.37	93.65
01/26/10	04:00	04:06	1	20.07	20.07
01/26/10	04:36	04:42	1	20.45	20.45
01/26/10	07:00	07:12	2	57.89	88.56

Emission Point (2a): Kiln Stack (ESP).

Monitor/Method 9 Opacity Readings (2b): A continuous opacity monitor system has been installed on the stack. The measured opacity readings in the table above are values as recorded in the plant data historian.

Specific Cause of Malfunction (5b) (2a): The kiln was in shutdown due to excess ring build-up.

Verify malfunction has been corrected (5a): Measured opacity at the stack returned to permitted levels.

Corrective Action Taken (2d): Plant personnel immediately decreased kiln revolutions, cut the fuel, worked to remove the ring and managed kiln conditions to bring the stack opacity back within permitted limits.

Measures to prevent recurrence (5c): Holcim is continually endeavoring to reduce upset/malfunction conditions. Data from this event will be included in future analyses. Upsets, in addition to having potential for causing excess emissions, have potential for adversely impacting production rates and plant economics. As a result, Holcim has a strong interest in reducing the frequency and duration of upset conditions.

Verify the event was not caused by poor maintenance, careless operation, poor design, or any other preventable upset condition or breakdown (5d): Holcim (US) Inc. – Trident Plant believes that the equipment malfunction could not have been prevented and was not a result of poor maintenance, careless operation, or poor design.

Based on the information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

Signature

January 28, 2010
Date

Holcim (US) Inc – Trident Plant
Plant Manager or Plant Manager Designee

Inspector Comments: ______

DECLARATION OF TIM CRAWFORD

1. I am a member of Montanans Against Toxic Burning and have been since about 2008. I am also a life member of the Sierra Club and have been since 2000.

2. I live with my wife on my ranch in Bozeman, Montana, which is about 10 miles downwind from Holcim Inc.'s Trident cement plant.

3. I also own land along the East Gallatin River, just upstream from the Trident plant. I bought it about 20 years ago.

4. The Trident plant is right at the headwaters of the Missouri River, where three rivers, including the Gallatin, meet. There is a large population of osprey—fish-eating hawks—there. There are also a lot of golden and bald eagles in the Gallatin Valley.

5. The plant's emissions cause me concern because of their impacts on me physically, as well as on my property and my enjoyment of the activities I undertake there.

6. I enjoy hunting on my properties in the Gallatin Valley, and I plan to continue hunting there. I hunt ducks, geese, and white-tail deer on my Gallatin River land. I also allow friends to hunt on that land. We usually take about 5-6 deer each year. We eat what we kill. If friends who I've allowed to hunt on my land get a deer, they usually give me a choice cut or some summer sausage as a way of saying thank you, and we eat that.

7. On my 300-acre ranch, we usually take 12-20 white-tail deer each year for human consumption. We also grow hay and a grain (wheat or barley) for sale locally. My wife has horses on the ranch, and we also have chickens and ~~guinea~~ Pea fowl. We eat their eggs.

8. I also fish along the Gallatin River. I practice catch and release because I am concerned about maintaining ample and healthy fish populations. I am also aware that mercury accumulates in carnivorous fish, and this contributes to my not eating local fish.

9. In addition, I enjoy seeing and photographing the birds of prey here in the Gallatin Valley.

10. Walking and biking in the area around my home are also very important to me.

11. I am concerned about the Trident plant's emissions of dangerous pollutants like particulate matter and mercury. Because of the geography and weather patterns in the Gallatin Valley, the plant's emissions can get trapped in the valley. The winds come out of the west, but the air must cool when it goes over the Bridger Mountains on the east side of the valley. When it does, there is precipitation, mostly in the eastern part of the valley and in the Bridgers. I am concerned that the mercury from the plant ends up in our ground and surface waters. I am aware from my reading that mercury does not diminish in hazardousness and that it accumulates up the food chain. We drink well water and irrigate using surface waters, and the deer and waterfowl drink the surface water too. A friend of mine who is a biologist working with eagles has told me about the harmful effects of mercury on animals like birds of prey. I am concerned that the mercury and other pollutants from the plant harm the wildlife that I enjoy. Also, when we eat them, whatever mercury they've consumed ends up in us, and this causes me concern.

12. The fences down on my Gallatin River land and on other lands right by the plant have a bit of a coating of soot. I believe, based on their proximity to the plant, that it came from the Trident plant. I am concerned that the soot from the plant is bad for my lungs.

13. I am especially concerned about the long-term impacts the Trident plant's pollution has and will have on the water quality and the quality of life in the Gallatin Valley. Once pollutants like mercury get into the land and the water, they are extremely difficult to get out. This has been my home for 20 years. I very much enjoy hunting, fishing, and farming here. I

also enjoy seeing and photographing the bald eagles, golden eagles, and osprey in the area. For all my activities to continue, I need clean water and healthy animals.

14. I am aware that EPA has weakened the standards for hazardous air pollution from cement plants, including the Trident plant, by weakening the particulate matter standard and delaying the date by which cement plants have to comply with all the standards. This causes me great concern. The particulate matter and mercury that the Trident plant emits get into the environment around me. I spend a lot of time outdoors, downwind of the plant. I breathe in the pollutants the plant emits. The more of them, the worse for my lungs, for the water and the land, and for the plants and animals that rely on the water and land, and which I eat. And because mercury is cumulative and persistent, any mercury that comes out of the Trident plant will stay in the environment. If the regulations were stronger and became fully effective sooner, my enjoyment of my activities like hunting would be improved, and I would have greater peace of mind that the water quality and my quality of life here in the Gallatin Valley will be preserved into the future.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this 26 day of March, 2013.

Tim Crawford

Tim Crawford

Thomas H. Crawford III

Exhibit K

From: Keith Barnett/RTP/USEPA/US
To: Cortney_Higgins@omb.eop.gov
Cc: Charlotte Bertrand/DC/USEPA/US@EPA, Amy Lamson/RTP/USEPA/US@EPA, Ron Evans/RTP/USEPA/US@EPA, Walton.Tom@epamail.epa.gov, Steven |
|Silverman/DC/USEPA/US@EPA, Torres.Elineth@epamail.epa.gov, "Michael Laney" <mnl@rti.org>, Susan Fairchild/RTP/USEPA/US@EPA
Date: 07/14/2010 02:59 PM
Subject: Cost spreadsheet

Dear Courtney:

I got clearance from OPEI to send you the Portland Cement cost spreadsheets and some of the economics tables. This is what I plan to discuss on Friday.

(See attached file: Portlandcementtables.docx)(See attached file: costs for OMB-7-1-10.xls)

We already talked about emissions levels - are there other items you want to talk about?

Keith W. Barnett
USEPA/OAQPS/SPPD/MMG
Mail Code D243-02
Research Triangle Park, NC 27711
919-541-5605
barnett.keith@epa.gov

Table 3-5. National-Level Market Impacts: 2005

		Changes from Baseline	
	Baseline	Absolute	Percent
Market Price ($/metric ton)	$83.70	$4.40	5.3%
Market Output (million metric tons)	126	−6	−4.7%
Domestic production	93	−10	−10.8%
Imports	33	3	10.0%

Table 3-6. Regional Compliance Costs and Market Price Changes ($/metric ton of cement): 2005

	Incremental Compliance Costs ($/metric ton of estimated cement production)				Market Price Change	
Market	Mean	Minimum	Maximum	Baseline Price	Absolute	Percent
Atlanta	$3.60	$1.10	$5.90	$81.30	$2.60	3.2%
Baltimore/Philadelphia	$6.20	$1.20	$10.00	$81.20	$5.70	7.0%
Birmingham	$3.60	$1.10	$4.80	$82.60	$3.70	4.5%
Chicago	$6.80	$0.90	$10.10	$65.90	$4.40	6.7%
Cincinnati	$8.10	$4.00	$14.10	$84.10	$10.00	11.9%
Dallas	$5.60	$3.50	$8.50	$74.70	$4.90	6.6%
Denver	$3.00	$1.00	$8.10	$88.70	$5.30	6.0%
Detroit	$6.50	$4.00	$10.30	$92.80	$6.30	6.8%
Florida	$3.40	$1.20	$5.50	$90.70	$3.30	3.6%
Kansas City	$8.60	$3.80	$13.80	$86.10	$7.80	9.1%
Los Angeles	$6.00	$3.20	$13.10	$77.30	$4.10	5.3%
Minneapolis	$6.30	$4.50	$8.80	$92.20	$8.20	8.9%
New York/Boston	$2.50	$1.00	$4.50	$89.00	$1.60	1.8%
Phoenix	$1.90	$1.00	$6.00	$82.10	$3.20	3.9%
Pittsburgh	$7.60	$6.90	$8.00	$88.00	$5.30	6.0%
St. Louis	$4.80	$3.80	$5.60	$83.70	$5.20	6.2%
Salt Lake City	$5.90	$1.60	$9.90	$91.40	$9.70	10.6%
San Antonio	$4.00	$0.80	$7.70	$82.30	$3.20	3.9%

San Francisco	$3.10	$1.00	$5.00	$96.90	$3.20	3.3%
Seattle	$1.20	$1.00	$1.40	$88.00	$0.60	0.7%
Grand Total	$5.20	$0.80	$14.10	$83.70	$4.40	5.3%

Table 3-7. Summary of Regional Market Impacts: 2005

	Regional Markets		
	With Imports	Without Imports	All Markets
Change in Market Price			
Absolute ($/metric ton)			
Mean	$4.70	$5.90	$4.40
Median	$4.30	$5.20	$4.60
Minimum	$0.60	$3.20	$0.60
Maximum	$9.70	$10.00	$10.00
Percentage of baseline price			
Mean	5.5%	7.0%	5.3%
Median	5.7%	6.1%	6.0%
Minimum	0.6%	3.9%	0.6%
Maximum	10.6%	11.9%	11.9%
Change in Domestic Production			
Absolute (thousand metric tons)			
Mean	−562	−257	−298
Median	−457	−251	−303
Minimum	−59	−144	−20
Maximum	−1,519	−380	−679
Percentage of baseline production			
Mean	−12.3%	−6.2%	−11.1%
Median	−11.0%	−5.4%	−10.4%
Minimum	−5.6%	−3.4%	−3.4%
Maximum	−35.1%	−10.4%	−35.1%

Table 3-8. Distribution of Industry Impacts: 2005

	Changes in Total Operating Profit: Plants with Loss	Plants with Gain	All Plants
Number	59	44	103
Cement Capacity (million metric tons)			
Total	55,145	39,070	94,214
Average per plant	935	888	915
Compliance Costs			
Total (thousand)	$299,102	$70,908	$370,010
Average ($/metric cement)	$5.42	$1.81	$3.93
Capacity Utilization (percent)			
Baseline	99.4%	97.9%	98.7%
With regulation	80.0%	99.5%	88.1%
Change in total operating profits (million)	−$383	$144	−$239
Change in Employees (thousand)	−1.6	0.1	−1.5

Table 3-9. Cement Plants with Significant Utilization Changes: 2005

	Total
Number	15
Cement Capacity (thousand metric tons)	
Total	8,969
Average per plant	598
Compliance Costs	
Total (thousand)	$70,369
Average ($/metric ton)	$7.85
Capacity Utilization (%)	
Baseline	98.4%
With regulation	54.8%
Change in Operating Profit (million)	−$135
Change in Employees (thousand)	−0.6

Table 3-10. Job Losses/Gains Associated with the Final Rule

Method	1,000 Jobs
Partial equilibrium model (demand effect only)	**−1.5**
Literature-based estimate (net effect [A + B + C below])	**0.3 (−0.6 to +1.3)**
A. Literature-based estimate: Demand effect	−0.8 (−1.6 to +0.1)
B. Literature-based estimate: Cost effect	0.5 (+0.2 to +0.9)
C. Literature-based estimate: Factor shift effect	0.6 (+0 to +1.1)

Table 4-1. Small Entity Analysis

Owner	Entity Type	Annual Sales ($$10^6$)	Employees	Plants	Kilns	Clinker Capacity (10^3 metric tons per year)	Cost-to-Sales Ratio
Salt River Materials Group[a]	Tribal government	$184[b]	NA	1	1	1,477	0.6%
Monarch Cement Company	Business	$154	600	1	2	787	2.8%
Continental Cement Company, LLC	Business	$93[c]	<750	1	1	1,164	4.5%
Snyder Associate Companies	Business	$29	350	1	2	286	7.4%

[a] Enterprise is owned by Salt River Pima-Maricopa Indian Community.

[b] EPA estimate. Estimate uses revenue data for four of the six enterprises owned by Salt River Pima-Maricopa Indian Community.

[c] EPA estimate. Estimate uses cement production levels and average market prices.

Kilns			Controls Necessary for Compliance				Incurred Capital Costs								
Unit*	Clinker Production 2008 (t/yr)	Kiln Type	Hg	HCl	Org HAP	PM	Wet scrubber TCI	ACI TCI	RTO/scrubber TCI	Lime injection TCI	PM TCI	All CEMS First Costs	blank	Total TCI w/o monitor costs ($)	blank
AL101	964,522	Preheater	ACI	None	ACI	None	0	2,469,177	0	0	0	424,720		2,469,177	
AL201	1,656,774	Precalciner	ACI	wet scrubber	ACI	None	30,419,407	4,241,341	0	0	0	568,676		34,660,748	
AL301	1,547,645	Precalciner	ACI	wet scrubber	ACI	None	29,200,858	3,961,971	0	0	0	568,676		33,162,830	
AL401	789,255	Preheater	ACI	wet scrubber	ACI	None	19,494,997	2,020,493	0	0	0	568,676		21,515,489	
AL501	990,978	Precalciner	ACI	wet scrubber	ACI	None	22,347,614	2,536,903	0	0	0	568,676		24,884,518	
ARNEW1	700,000	Precalciner	ACI	wet scrubber	ACI	None	18,140,599	1,792,000	0	0	0	568,676		19,932,599	
AZ101	132,300	Dry	ACI	None	ACI	None	0	338,688	0	0	0	568,676		338,688	
AZ102	132,300	Dry	ACI	None	ACI	None	0	338,688	0	0	0	424,720		338,688	
AZ103	132,300	Dry	ACI	None	ACI	None	0	338,688	0	0	0	568,676		338,688	
AZ104	1,068,140	Precalciner	ACI	wet scrubber	ACI	None	23,375,969	2,734,438	0	0	0	568,676		26,110,406	
AZ204	1,176,166	Precalciner	ACI	None	ACI	None	0	3,010,985	0	0	0	424,720		3,010,985	
CA101	1,176,166	Dry	ACI	wet scrubber	ACI	None	24,767,034	3,010,985	0	0	0	568,676		27,778,020	
CA102	1,176,166	Dry	ACI	wet scrubber	ACI	None	24,767,034	3,010,985	0	0	0	568,676		27,778,020	
CA1108	2,004,002	Precalciner	ACI	wet scrubber	ACI	None	34,098,218	5,130,245	0	0	0	568,676		39,228,463	
CA201	1,515,678	Precalciner	ACI	wet scrubber	ACI	None	28,837,458	3,880,136	0	0	0	568,676		32,717,594	
CA301	1,203,724	Precalciner	ACI	wet scrubber	ACI	None	25,113,598	3,081,533	0	0	0	568,676		28,195,131	
CA302	1,916,919	Precalciner	ACI	wet scrubber	ACI	None	33,201,301	4,907,314	0	0	0	568,676		38,108,615	
CA401	1,601,658	Precalciner	ACI	wet scrubber	ACI	None	29,808,129	4,100,245	0	0	0	568,676		33,908,375	
CA501	652,568	Precalciner	ACI	wet scrubber	ACI	None	17,392,755	1,670,575	0	0	0	568,676		19,063,330	
CA601	1,056,014	Precalciner	ACI and WS	wet scrubber	ACI	None	23,216,388	2,703,396	0	0	0	568,676		25,919,785	
CA701	1,700,866	Precalciner	ACI	wet scrubber	ACI	None	30,902,592	4,354,218	0	0	0	568,676		35,256,810	
CA801	1,138,688	Precalciner	ACI	wet scrubber	ACI	None	24,290,449	2,915,040	0	0	0	568,676		27,205,489	
CA901	928,146	Precalciner	ACI	wet scrubber	ACI	None	21,486,348	2,376,054	0	0	0	568,676		23,862,402	
CO101	522,496	Precalciner	ACI	None	ACI	None	0	1,337,589	0	0	0	424,720		1,337,589	
CO201	1,699,764	Precalciner	wet scrubber	wet scrubber	RTO and scrubber	membrane bags	0	0	25,367,865	0	973,636	568,676		26,341,501	
CONEW1	1,000,000	Precalciner	ACI	None	ACI	None	0	2,560,000	0	0	0	568,676		2,560,000	
FL101	693,354	Preheater	ACI	None	ACI	None	0	1,774,986	0	0	0	424,720		1,774,986	
FL102	687,842	Preheater	ACI	None	ACI	None	0	1,760,876	0	0	0	424,720		1,760,876	
FL201	789,255	Precalciner	ACI	wet scrubber	ACI	None	19,494,997	2,020,493	0	0	0	568,676		21,515,489	
FL301	666,898	Preheater	ACI	wet scrubber	ACI	None	17,620,920	1,707,260	0	0	0	568,676		19,328,180	
FL302	896,179	Precalciner	ACI	wet scrubber	ACI	None	21,039,222	2,294,218	0	0	0	568,676		23,333,441	
FL401	1,092,391	Precalciner	ACI	wet scrubber	ACI	None	23,692,972	2,796,520	0	0	0	568,676		26,489,492	
FL501	881,849	Precalciner	ACI	wet scrubber	ACI	None	20,836,719	2,257,534	0	0	0	568,676		23,094,253	
FL601	1,897,078	Precalciner	ACI	None	ACI	None	0	4,856,519	0	0	0	424,720		4,856,519	
FLNEW1	1,100,000	Precalciner	ACI	wet scrubber	ACI	None	23,791,861	2,816,000	0	0	0	568,676		26,607,861	
FLNEW2	750,000	Precalciner	ACI	wet scrubber	ACI	None	18,907,302	1,920,000	0	0	0	568,676		20,827,302	
GA201	822,324	Preheater	ACI	None	ACI	None	0	2,105,150	0	0	0	424,720		2,105,150	
IA101	601,862	Dry	ACI	wet scrubber	ACI	None	16,568,796	1,540,767	0	0	0	568,676		18,109,562	
IA102	385,809	Dry	ACI	wet scrubber	ACI	None	12,688,672	987,671	0	0	0	568,676		13,676,343	
IA201	1,074,754	Precalciner	ACI	wet scrubber	ACI	None	23,462,707	2,751,369	0	0	0	568,676		26,214,076	
IA301 *	805,790	Precalciner	wet scrubber	wet scrubber	RTO and scrubber	None	0	0	32,897,837	0	0	568,676		32,897,837	

ID101	126,766	Wet	ACI	wet scrubber	ACI	membrane bags	6,507,199	324,520	0	0	416,244	568,676		7,247,963	
ID102	159,835	Wet	ACI	wet scrubber	ACI	None	7,478,184	409,178	0	0	0	568,676		7,887,362	
IL101	625,011	Dry	ACI	wet scrubber	ACI	membrane bags	16,948,263	1,600,027	0	0	1,084,125	568,676		19,632,415	
IL201	175,267	Preheater	ACI	wet scrubber	ACI	None	7,903,394	448,685	0	0	0	568,676		8,352,079	
IL202	175,267	Preheater	ACI	wet scrubber	ACI	None	7,903,394	448,685	0	0	0	568,676		8,352,079	
IL203	175,267	Preheater	ACI	wet scrubber	ACI	None	7,903,394	448,685	0	0	0	568,676		8,352,079	
IL204	175,267	Dry	ACI	wet scrubber	ACI	None	7,903,394	448,685	0	0	0	568,676		8,352,079	
IL302	984,364	Precalciner	ACI	None	ACI	None	0	2,519,972	0	0	0	424,720		2,519,972	
IL401	469,585	Dry	ACI	wet scrubber	ACI	membrane bags	14,276,479	1,202,137	0	0	913,220	568,676		16,391,836	
IL402	648,159	Dry	ACI	wet scrubber	ACI	None	17,322,148	1,659,287	0	0	0	568,676		18,981,435	
IN301	328,489	Dry	ACI	wet scrubber	ACI	membrane bags	11,521,396	840,931	0	0	736,986	568,676		13,099,314	
IN302	684,535	Dry	ACI	wet scrubber	ACI	membrane bags	17,899,064	1,752,410	0	0	1,144,945	568,676		20,796,419	
IN401	276,680	Preheater	ACI	wet scrubber	RTO and scrubber	membrane bags	0	708,301	17,322,922	0	664,866	568,676		18,696,089	
IN402	276,680	Preheater	ACI	wet scrubber	RTO and scrubber	membrane bags	0	708,301	17,322,922	0	664,866	568,676		18,696,089	
IN403	302,033	Preheater	ACI	wet scrubber	ACI	membrane bags	10,955,336	773,205	0	0	700,777	568,676		12,429,318	
KS401	432,106	Precalciner	ACI	wet scrubber	ACI	None	13,581,477	1,106,191	0	0	0	568,676		14,687,668	
KS402	339,512	Precalciner	ACI	wet scrubber	ACI	None	11,751,838	869,150	0	0	0	568,676		12,620,988	
KY101	1,550,952	Precalciner	ACI	wet scrubber	ACI	None	29,238,279	3,970,437	0	0	0	568,676		33,208,717	
MD101	169,756	Wet	ACI	wet scrubber	ACI	membrane bags	7,753,321	434,575	0	0	495,955	568,676		8,683,851	
MD102	169,756	Wet	ACI	wet scrubber	ACI	membrane bags	7,753,321	434,575	0	0	495,955	568,676		8,683,851	
MD201	2,300,524	Precalciner	ACI	None	ACI	None	0	5,889,341	0	0	0	568,676		5,889,341	
MD301	564,383	Dry	ACI	wet scrubber	ACI	None	15,941,799	1,444,821	0	0	0	568,676		17,386,621	
ME101	713,195	Precalciner	ACI	None	ACI	None	0	1,825,780	0	0	0	424,720		1,825,780	
MI101	1,360,252	Precalciner	ACI	wet scrubber	ACI	None	27,024,922	3,482,246	0	0	0	568,676		30,507,168	
MI201	461,868	Wet	wet scrubber	wet scrubber	RTO and scrubber	membrane bags	0	0	23,558,375	0	904,187	568,676		24,462,561	
MI202	453,050	Wet	wet scrubber	wet scrubber	RTO and scrubber	membrane bags	0	0	23,287,454	0	893,788	568,676		24,181,242	
MI301	368,172	Dry	ACI	wet scrubber	ACI	None	12,337,388	942,520	0	0	0	568,676		13,279,909	
MI302	368,172	Dry	ACI	wet scrubber	ACI	None	12,337,388	942,520	0	0	0	568,676		13,279,909	
MI303	370,377	Dry	ACI	wet scrubber	ACI	None	12,381,661	948,164	0	0	0	568,676		13,329,825	
MI304	641,545	Dry	ACI	wet scrubber	ACI	None	17,215,877	1,642,356	0	0	0	568,676		18,858,232	
MI305	658,080	Dry	ACI	wet scrubber	ACI	None	17,480,746	1,684,684	0	0	0	568,676		19,165,430	
MO201	670,205	Dry	ACI	wet scrubber	ACI	None	17,673,294	1,715,726	0	0	0	568,676		19,389,019	
MO202	670,205	Dry	ACI	wet scrubber	ACI	None	17,673,294	1,715,726	0	0	0	568,676		19,389,019	
MO302	1,056,014	Precalciner	ACI	wet scrubber	ACI	None	23,216,388	2,703,396	0	0	0	568,676		25,919,785	
MO501	1,018,536	Precalciner	ACI	wet scrubber	ACI	None	22,718,442	2,607,451	0	0	0	568,676		25,325,893	
MONEW1	4,400,000	Precalciner	ACI	lime injection	ACI	None	0	11,264,000	0	426,113	0	568,676		11,690,113	
MONEW2	1,000,000	Precalciner	ACI	wet scrubber	ACI	None	22,469,468	2,560,000	0	0	0	568,676		25,029,468	
MT101	329,591	Wet	ACI	None	ACI	membrane bags	0	843,753	0	0	738,469	424,720		1,582,222	
MT201	308,647	Wet	ACI	None	ACI	membrane bags	0	790,137	0	0	709,945	424,720		1,500,081	
NE101	351,637	Preheater	ACI	wet scrubber	ACI	membrane bags	12,001,893	900,192	0	0	767,722	568,676		13,669,807	
NE102	607,374	Precalciner	ACI	wet scrubber	ACI	membrane bags	16,659,667	1,554,876	0	0	1,065,665	568,676		19,280,208	
NM101	238,099	Preheater	ACI	None	ACI	None	0	609,534	0	0	0	424,720		609,534	
NM102	238,099	Preheater	ACI	None	ACI	None	0	609,534	0	0	0	424,720		609,534	
NV101	249,122	Dry	ACI	None	ACI	None	0	637,753	0	0	0	424,720		637,753	
NV102	249,122	Preheater	ACI	None	ACI	None	0	637,753	0	0	0	424,720		637,753	
NVNEW1	500,000	Precalciner	ACI	wet scrubber	ACI	None	14,824,321	1,280,000	0	0	0	568,676		16,104,321	

NY101	645,954	Preheater	ACI	None	ACI	None	0	1,653,643	0	0	0	424,720		1,653,643	
NY201	933,658	Wet	ACI	wet scrubber	ACI	membrane bags	21,562,812	2,390,164	0	0	1,379,303	568,676		25,332,279	
NY202	932,555	Wet	ACI	wet scrubber	ACI	membrane bags	21,547,534	2,387,342	0	0	1,378,326	568,676		25,313,201	
NY301	630,522	Wet	ACI	None	ACI	None	0	1,614,136	0	0	0	424,720		1,614,136	
OH101	728,628	Preheater	ACI	wet scrubber	ACI	None	18,582,161	1,865,287	0	0	0	568,676		20,447,449	
OK101	209,439	Dry	wet scrubber	wet scrubber	RTO and scrubber	membrane bags	0	0	14,657,810	0	562,577	568,676		15,220,386	
OK102	209,439	Dry	wet scrubber	wet scrubber	RTO and scrubber	membrane bags	0	0	14,657,810	0	562,577	568,676		15,220,386	
OK103	308,647	Dry	wet scrubber	wet scrubber	RTO and scrubber	membrane bags	0	0	18,497,444	0	709,945	568,676		19,207,389	
OK201	277,782	Wet	ACI	lime injection	ACI	membrane bags	0	711,123	0	81,222	666,454	568,676		1,458,799	
OK202	288,806	Wet	ACI	lime injection	ACI	membrane bags	0	739,342	0	83,141	682,198	568,676		1,504,681	
OK301	340,614	Dry	ACI	wet scrubber	ACI	None	11,774,716	871,972	0	0	0	568,676		12,646,688	
OK302	319,670	Dry	ACI	wet scrubber	ACI	None	11,334,808	818,356	0	0	0	568,676		12,153,163	
OR101	985,466	Precalciner	ACI and WS	wet scrubber	ACI	None	22,272,956	2,522,794	0	0	0	424,720		24,795,750	
PA101	145,505	Wet	ACI	wet scrubber	ACI	None	7,068,377	372,493	0	0	0	568,676		7,440,870	
PA102	145,505	Wet	ACI	wet scrubber	ACI	None	7,068,377	372,493	0	0	0	568,676		7,440,870	
PA201	262,350	Preheater	ACI	wet scrubber	ACI	None	10,067,497	671,616	0	0	0	568,676		10,739,114	
PA202	580,918	Precalciner	ACI	wet scrubber	ACI	None	16,220,406	1,487,150	0	0	0	568,676		17,707,556	
PA301	274,476	Dry	ACI	wet scrubber	ACI	None	10,344,154	702,657	0	0	0	568,676		11,046,811	
PA302	261,248	Dry	ACI	wet scrubber	ACI	None	10,042,096	668,794	0	0	0	568,676		10,710,890	
PA303	264,555	Dry	ACI	wet scrubber	ACI	None	10,118,173	677,260	0	0	0	568,676		10,795,433	
PA401	261,248	Wet	ACI	wet scrubber	ACI	membrane bags	10,042,096	668,794	0	0	642,360	568,676		11,353,250	
PA402	405,651	Wet	ACI	wet scrubber	ACI	membrane bags	13,076,275	1,038,465	0	0	836,447	568,676		14,951,187	
PA501	1,410,958	Preheater	ACI	wet scrubber	ACI	membrane bags	27,624,939	3,612,054	0	0	1,767,077	568,676		33,004,071	
PA701	461,868	Preheater	ACI	wet scrubber	ACI	None	14,135,259	1,182,383	0	0	0	568,676		15,317,642	
PA702	311,954	Preheater	ACI	wet scrubber	ACI	None	11,169,847	798,602	0	0	0	568,676		11,968,449	
PA801	587,532	Preheater	ACI	wet scrubber	ACI	None	16,330,959	1,504,082	0	0	0	568,676		17,835,040	
PA802	587,532	Preheater	ACI	wet scrubber	ACI	None	16,330,959	1,504,082	0	0	0	568,676		17,835,040	
PA901	123,458	Wet	ACI	wet scrubber	ACI	None	6,404,782	316,052	0	0	0	568,676		6,720,834	
PR101	652,568	Preheater	ACI	wet scrubber	ACI	None	17,392,750	1,670,574	0	0	0	568,676		19,063,324	
PR201	970,000	Precalciner	ACI	wet scrubber	ACI	None	22,062,557	2,483,200	0	0	0	568,676		24,545,757	
SC201	1,078,060	Precalciner	ACI	wet scrubber	ACI	None	23,505,996	2,759,835	0	0	0	568,676		26,265,831	
SD101	154,324	Wet	ACI	None	ACI	None	0	395,068	0	0	0	424,720		395,068	
SD102	154,324	Wet	ACI	None	ACI	None	0	395,068	0	0	0	424,720		395,068	
SD103	660,284	Precalciner	ACI	None	ACI	None	0	1,690,328	0	0	0	424,720		1,690,328	
TN101	899,486	Precalciner	ACI	None	ACI	None	0	2,302,684	0	0	0	424,720		2,302,684	
TN201	756,186	Precalciner	ACI	wet scrubber	ACI	None	19,000,710	1,935,835	0	0	0	568,676		20,936,545	
TX1001	859,803	Precalciner	ACI	wet scrubber	ACI	membrane bags	20,522,587	2,201,095	0	0	1,312,763	568,676		24,036,446	
TX101	977,750	Precalciner	ACI	lime injection	ACI	None	0	2,503,040	0	172,818	0	568,676		2,675,859	
TX1201	1,264,351	Precalciner	ACI	wet scrubber	ACI	None	25,865,055	3,236,739	0	0	0	568,676		29,101,794	
TX1301	111,333	Wet	ACI	wet scrubber	ACI	None	6,019,593	285,012	0	0	0	568,676		6,304,606	
TX201	320,773	Wet	ACI	wet scrubber	ACI	membrane bags	11,358,243	821,178	0	0	726,550	568,676		12,905,970	
TX202	320,773	Wet	ACI	wet scrubber	ACI	membrane bags	11,358,243	821,178	0	0	726,550	568,676		12,905,970	
TX203	320,773	Wet	ACI	wet scrubber	ACI	membrane bags	11,358,243	821,178	0	0	726,550	568,676		12,905,970	
TX301	159,835	Preheater	ACI	wet scrubber	ACI	None	7,478,184	409,178	0	0	0	568,676		7,887,362	
TX302	159,835	Preheater	ACI	wet scrubber	ACI	None	7,478,184	409,178	0	0	0	568,676		7,887,362	
TX303	180,779	Preheater	ACI	wet scrubber	ACI	None	8,051,590	462,794	0	0	0	568,676		8,514,385	

TX402	608,476	Precalciner	ACI	None	ACI	None	0	1,557,698	0	0	0	568,676		1,557,698	
TX501	1,074,754	Precalciner	ACI	wet scrubber	ACI	None	23,462,707	2,751,369	0	0	0	568,676		26,214,076	
TX502	1,237,896	Precalciner	ACI	wet scrubber	ACI	None	25,538,960	3,169,013	0	0	0	568,676		28,707,973	
TX601	241,406	Dry	ACI	None	ACI	None	0	618,000	0	0	0	424,720		618,000	
TX602	272,271	Preheater	ACI	None	ACI	None	0	697,013	0	0	0	424,720		697,013	
TX701 *	1,087,981	Precalciner	wet scrubber	wet scrubber	RTO and scrubber	membrane bags	0	0	39,391,925	0	1,511,889	568,676		40,903,814	
TX702 *	1,133,176	Precalciner	wet scrubber	wet scrubber	RTO and scrubber	membrane bags	0	0	40,365,727	0	1,549,264	568,676		41,914,992	
TX905 *	2,164,939	Precalciner	ACI	wet scrubber	ACI	None	35,715,789	5,542,245	0	0	0	568,676		41,258,033	
UT101	918,225	Precalciner	ACI	None	ACI	None	0	2,350,657	0	0	0	424,720		2,350,657	
UT201	784,846	Precalciner	wet scrubber	wet scrubber	RTO and scrubber	membrane bags	0	0	32,382,093	0	1,242,847	568,676		33,624,939	
VA101	1,247,816	Precalciner	ACI	wet scrubber	ACI	None	25,661,569	3,194,410	0	0	0	568,676		28,855,979	
WA101	744,060	Precalciner	ACI	None	ACI	None	0	1,904,794	0	0	0	424,720		1,904,794	
WA201	419,981	Wet	ACI	None	ACI	membrane bags	0	1,075,150	0	0	854,053	424,720		1,929,203	
WV101	229,281	Wet	ACI	wet scrubber	ACI	membrane bags	9,285,672	586,959	0	0	593,974	568,676		10,466,605	
WV102	229,281	Wet	ACI	wet scrubber	ACI	membrane bags	9,285,672	586,959	0	0	593,974	568,676		10,466,605	
WV103	346,126	Wet	ACI	wet scrubber	ACI	membrane bags	11,888,666	886,082	0	0	760,479	568,676		13,535,228	
WVNEW1	700,000	Precalciner	ACI	wet scrubber	ACI	None	18,140,599	1,792,000	0	0	0	568,676		19,932,599	
WY101	189,598	Dry	ACI	wet scrubber	ACI	None	8,284,998	485,370	0	0	0	568,676		8,770,368	
WY102	442,027	Preheater	ACI	wet scrubber	ACI	None	12,553,832	1,131,589	0	0	0	568,676		13,685,421	
ALNEW1	1,300,000	Precalciner	ACI	wet scrubber	ACI	None	22,347,614	3,328,000	0	0	0	568,676		25,675,614	
AZNEW1	660,000	Precalciner	ACI	wet scrubber	ACI	None	24,767,034	1,689,600	0	0	0	568,676		26,456,634	
AZNEW2	1,900,000	Precalciner	ACI	wet scrubber	ACI	None	24,767,034	4,864,000	0	0	0	568,676		29,631,034	
AZNEW3	1,100,000	Precalciner	ACI	wet scrubber	ACI	None	24,767,034	2,816,000	0	0	0	568,676		27,583,034	
GANEW1	900,000	Precalciner	ACI	wet scrubber	ACI	None	19,981,066	2,304,000	0	0	0	568,676		22,285,066	
ILNEW1	1,826,000	Precalciner	ACI	wet scrubber	ACI	None	17,322,148	4,674,560	0	0	0	568,676		21,996,708	
INNEW1	1,224,000	Precalciner	ACI	wet scrubber	ACI	None	10,955,336	3,133,440	0	0	0	568,676		14,088,776	
NCNEW1	2,300,000	Precalciner	ACI	wet scrubber	ACI	None	11,098,650	5,888,000	0	0	0	568,676		16,986,650	
PANEW1	379,000	Precalciner	ACI	wet scrubber	ACI	None	6,404,782	970,240	0	0	0	568,676		7,375,022	
							1,952,321,627	285,502,703	299,710,183	763,294	33,157,505	87,526,068		2,571,455,311	

*Shaded units are area sources.

Incurred Annualized Costs							
Wet scrubber TAC	ACI TAC	RTO/scrubber TAC	Lime injection TAC	PM TAC	All CEMS Annual Costs	blank	Total TAC w/o monitor costs($)
0	877,715	0	0	0	154,820		877,715
4,328,306	1,507,664	0	0	0	198,117		5,835,970
4,154,009	1,408,357	0	0	0	198,117		5,562,366
2,751,092	718,222	0	0	0	198,117		3,469,314
3,174,964	901,790	0	0	0	198,117		4,076,754
2,492,445	637,000	0	0	0	198,117		3,129,445
0	120,393	0	0	0	154,820		120,393
0	120,393	0	0	0	154,820		120,393
0	120,393	0	0	0	154,820		120,393
3,268,230	972,007	0	0	0	198,117		4,240,237
0	1,070,311	0	0	0	154,820		1,070,311
3,485,298	1,070,311	0	0	0	198,117		4,555,609
3,485,298	1,070,311	0	0	0	198,117		4,555,609
4,834,977	1,823,642	0	0	0	198,117		6,658,619
4,086,982	1,379,267	0	0	0	198,117		5,466,249
3,557,894	1,095,389	0	0	0	198,117		4,653,283
4,707,406	1,744,397	0	0	0	198,117		6,451,803
4,224,949	1,457,509	0	0	0	198,117		5,682,458
2,462,003	593,837	0	0	0	198,117		3,055,840
3,288,465	960,973	0	0	0	198,117		4,249,438
4,380,537	1,547,788	0	0	0	198,117		5,928,325
3,440,985	1,036,206	0	0	0	198,117		4,477,191
3,042,855	844,613	0	0	0	198,117		3,887,468
0	475,471	0	0	0	154,820		475,471
0	0	5,048,957	0	207,100	198,117		5,256,057
0	910,000	0	0	0	198,117		910,000
0	630,952	0	0	0	154,820		630,952
0	625,936	0	0	0	154,820		625,936
2,756,320	718,222	0	0	0	198,117		3,474,542
2,502,925	606,877	0	0	0	198,117		3,109,802
2,974,937	815,523	0	0	0	198,117		3,790,460
3,350,711	994,075	0	0	0	198,117		4,344,787
2,946,267	802,483	0	0	0	198,117		3,748,749
0	1,726,341	0	0	0	154,820		1,726,341
3,364,716	1,001,000	0	0	0	198,117		4,365,716
2,673,129	682,500	0	0	0	198,117		3,355,629
0	748,315	0	0	0	154,820		748,315
2,128,421	547,694	0	0	0	198,117		2,676,115
1,656,171	351,086	0	0	0	198,117		2,007,257
3,286,955	978,026	0	0	0	198,117		4,264,981
0	0	6,585,832	0	0	198,117		6,585,832

917,836	115,357	0	0	132,190	198,117		1,165,383
1,054,737	145,450	0	0	0	198,117		1,200,187
2,255,350	568,760	0	0	221,949	198,117		3,046,059
1,077,896	159,493	0	0	0	198,117		1,237,390
1,077,896	159,493	0	0	0	198,117		1,237,390
1,077,896	159,493	0	0	0	198,117		1,237,390
1,077,098	159,493	0	0	0	198,117		1,236,592
0	895,771	0	0	0	154,820		895,771
1,912,234	427,322	0	0	198,980	198,117		2,538,536
2,303,060	589,825	0	0	0	198,117		2,892,885
1,511,425	298,925	0	0	175,296	198,117		1,985,645
2,287,329	622,927	0	0	230,122	198,117		3,140,378
0	251,779	3,207,221	0	165,603	198,117		3,624,603
0	251,779	3,207,221	0	165,603	198,117		3,624,603
1,524,599	274,850	0	0	170,429	198,117		1,969,879
1,905,162	393,216	0	0	0	198,117		2,298,379
1,649,425	308,956	0	0	0	198,117		1,958,380
4,152,940	1,411,366	0	0	0	198,117		5,564,306
1,045,808	154,478	0	0	142,903	198,117		1,343,189
1,045,808	154,478	0	0	142,903	198,117		1,343,189
0	2,093,477	0	0	0	198,117		2,093,477
2,093,139	513,589	0	0	0	198,117		2,606,728
0	649,008	0	0	0	154,820		649,008
3,553,475	1,237,829	0	0	0	198,117		4,791,304
0	0	4,199,890	0	197,766	198,117		4,397,656
0	0	4,148,168	0	196,369	198,117		4,344,537
1,669,412	335,036	0	0	0	198,117		2,004,449
1,669,412	335,036	0	0	0	198,117		2,004,449
1,675,231	337,043	0	0	0	198,117		2,012,273
2,304,646	583,806	0	0	0	198,117		2,888,452
2,338,805	598,853	0	0	0	198,117		2,937,658
2,469,054	609,887	0	0	0	198,117		3,078,941
2,469,054	609,887	0	0	0	198,117		3,078,941
3,207,585	960,973	0	0	0	198,117		4,168,558
3,139,756	926,867	0	0	0	198,117		4,066,623
0	4,004,000	0	3,009,995	0	198,117		7,013,995
3,105,827	910,000	0	0	0	198,117		4,015,827
0	299,928	0	0	175,495	154,820		475,423
0	280,869	0	0	171,662	154,820		452,530
1,616,988	319,990	0	0	179,426	198,117		2,116,404
2,334,896	552,710	0	0	219,468	198,117		3,107,074
0	216,670	0	0	0	154,820		216,670
0	216,670	0	0	0	154,820		216,670
0	226,701	0	0	0	154,820		226,701
0	226,701	0	0	0	154,820		226,701
2,094,479	455,000	0	0	0	198,117		2,549,479

0	587,819	0	0	0	154,820		587,819
2,603,396	849,628	0	0	261,619	198,117		3,714,643
2,601,759	848,625	0	0	261,487	198,117		3,711,872
0	573,775	0	0	0	154,820		573,775
2,488,647	663,051	0	0	0	198,117		3,151,699
0	0	2,479,404	0	151,856	198,117		2,631,260
0	0	2,479,404	0	151,856	198,117		2,631,260
0	0	3,157,944	0	171,662	198,117		3,329,606
0	252,782	0	788,633	165,817	198,117		1,207,232
0	262,813	0	817,404	167,933	198,117		1,248,149
1,319,830	309,959	0	0	0	198,117		1,629,789
1,278,770	290,900	0	0	0	198,117		1,569,670
3,162,679	896,774	0	0	0	154,820		4,059,453
954,101	132,410	0	0	0	198,117		1,086,511
954,101	132,410	0	0	0	198,117		1,086,511
1,402,125	238,739	0	0	0	198,117		1,640,863
2,276,016	528,635	0	0	0	198,117		2,804,652
1,364,119	249,773	0	0	0	198,117		1,613,892
1,326,104	237,735	0	0	0	198,117		1,563,839
1,335,687	240,745	0	0	0	198,117		1,576,432
1,339,224	237,735	0	0	162,579	198,117		1,739,538
1,724,326	369,142	0	0	188,663	198,117		2,282,130
3,798,245	1,283,972	0	0	313,733	198,117		5,395,950
1,962,001	420,300	0	0	0	198,117		2,382,302
1,554,167	283,878	0	0	0	198,117		1,838,045
2,262,934	534,654	0	0	0	198,117		2,797,588
2,262,934	534,654	0	0	0	198,117		2,797,588
867,031	112,347	0	0	0	198,117		979,378
2,470,377	593,837	0	0	0	198,117		3,064,214
3,119,831	882,700	0	0	0	198,117		4,002,531
3,301,916	981,035	0	0	0	198,117		4,282,951
0	140,434	0	0	0	154,820		140,434
0	140,434	0	0	0	154,820		140,434
0	600,859	0	0	0	154,820		600,859
0	818,532	0	0	0	154,820		818,532
2,670,698	688,129	0	0	0	198,117		3,358,826
2,876,876	782,421	0	0	252,676	198,117		3,911,973
0	889,753	0	423,289	0	198,117		1,313,041
3,621,713	1,150,559	0	0	0	198,117		4,772,272
816,290	101,313	0	0	0	198,117		917,603
1,507,200	291,903	0	0	173,893	198,117		1,972,997
1,507,200	291,903	0	0	173,893	198,117		1,972,997
1,507,200	291,903	0	0	173,893	198,117		1,972,997
1,043,997	145,450	0	0	0	198,117		1,189,447
1,043,997	145,450	0	0	0	198,117		1,189,447
1,123,430	164,509	0	0	0	198,117		1,287,939

0	553,713	0	0	0	198,117		553,713
3,286,955	978,026	0	0	0	198,117		4,264,981
3,576,289	1,126,485	0	0	0	198,117		4,702,774
0	219,680	0	0	0	154,820		219,680
0	247,767	0	0	0	154,820		247,767
0	0	8,094,888	0	279,437	198,117		8,374,326
0	0	8,326,128	0	284,460	198,117		8,610,588
4,991,597	1,970,095	0	0	0	198,117		6,961,692
0	835,585	0	0	0	154,820		835,585
0	0	6,501,652	0	243,280	198,117		6,744,932
3,603,701	1,135,513	0	0	0	198,117		4,739,214
0	677,095	0	0	0	154,820		677,095
0	382,182	0	0	191,029	154,820		573,211
1,245,096	208,645	0	0	156,076	198,117		1,609,817
1,245,096	208,645	0	0	156,076	198,117		1,609,817
1,579,141	314,974	0	0	178,453	198,117		2,072,569
2,486,649	637,000	0	0	0	198,117		3,123,649
1,165,578	172,534	0	0	0	198,117		1,338,112
1,769,873	402,244	0	0	0	198,117		2,172,118
3,208,169	1,183,000	0	0	0	198,117		4,391,169
3,427,432	600,600	0	0	0	198,117		4,028,032
3,496,222	1,729,000	0	0	0	198,117		5,225,222
3,457,063	1,001,000	0	0	0	198,117		4,458,063
2,748,162	819,000	0	0	0	198,117		3,567,162
2,146,341	1,661,660	0	0	0	198,117		3,808,001
1,556,059	1,113,840	0	0	0	198,117		2,669,899
1,731,923	2,093,000	0	0	0	198,117		3,824,923
832,161	344,890	0	0	0	198,117		1,177,051
					30,597,920		440,744,891

Unit	NEI ID	Clinker Production 2008 (t/yr)	Kiln Type	Baseline Hg(lb/yr)*	Baseline Hg (lb/MM ton clinker)	Hg Control (Org HAP)	Hg Emission Reduction after Org HAP Control (lb/yr)	Annual baseline Org HAP emissions (tpy)	Org HAP Control	Org HAP Emission Reduction with Controls (tpy)	HCl Baseline emission factor (ppmvd@7% O2)	Baseline HCl Emissions (tpy)	HCl Control (Org HAP)
AL101	NEIAL321	964,522	Preheater	107.02	110.96	ACI	96	41	ACI	33	0.00	5.00	None
AL201	NEIAL8026	1,656,774	Precalciner	186.69	112.68	ACI and WS	183	80	ACI	64	12.06	93.33	wet scrubber
AL301	NEIAL1170004	1,547,645	Precalciner	316.80	204.70	ACI and WS	310	66	ACI	53	12.06	87.18	wet scrubber
AL401	NEIALT$4449	789,255	Preheater	31.66	40.11	ACI and WS	31	34	ACI	27	15.12	55.73	wet scrubber
AL501	NEIAL1150002	990,978	Precalciner	109.96	110.96	ACI and WS	108	42	ACI	34	7.61	35.22	wet scrubber
ARNEW1		700,000	Precalciner	77.67	110.96	ACI and WS	76	20	ACI	16	12.06	39.4	wet scrubber
AZ101	NEI18621	132,300	Dry	14.72	111.28	ACI	13	6	ACI	5	12.06	5.00	None
AZ102	NEI18621	132,300	Dry	14.72	111.28	ACI	13	6	ACI	5	12.06	5.00	None
AZ103	NEI18621	132,300	Dry	14.72	111.28	ACI	13	6	ACI	5	12.06	5.00	None
AZ104	NEI18621	1,068,140	Precalciner	120.94	113.22	ACI and WS	119	46	ACI	36	12.06	60.17	wet scrubber
AZ204	NEIAZ0250421	1,176,166	Precalciner	130.51	110.96	ACI	117	50	ACI	40	0.00	5.00	None
CA101	NEI22743	1,176,166	Dry	427.17	363.19	ACI and WS	419	50	ACI	40	12.06	66.25	wet scrubber
CA102	NEI22743	1,176,166	Dry	427.17	363.19	ACI and WS	419	50	ACI	40	12.06	66.25	wet scrubber
CA1108	NEI22877	2,004,002	Precalciner	222.37	110.96	ACI and WS	218	86	ACI	68	12.06	112.89	wet scrubber
CA201	NEI20046	1,515,678	Precalciner	104.05	68.65	ACI and WS	102	65	ACI	52	55.37	391.92	wet scrubber
CA301	NEI22900	1,203,724	Precalciner	133.57	110.96	ACI and WS	131	51	ACI	41	12.06	67.81	wet scrubber
CA302	NEI22900	1,916,919	Precalciner	212.70	110.96	ACI and WS	208	82	ACI	65	12.06	107.98	wet scrubber
CA401	NEI24859	1,601,658	Precalciner	177.72	110.96	ACI and WS	174	68	ACI	55	12.06	90.22	wet scrubber
CA501	NEI25375	652,568	Precalciner	68.83	105.47	ACI and WS	67	18	ACI	14	14.87	45.32	wet scrubber
CA601	NEICA1505122	1,056,014	Precalciner	1,785.26	1,690.57	ACI and WS	1,750	45	ACI	36	2.56	12.62	wet scrubber
CA701	NEI22838	1,700,866	Precalciner	188.73	110.96	ACI and WS	185	73	ACI	58	12.06	95.81	wet scrubber
CA801	NEI20130	1,138,688	Precalciner	126.35	110.96	ACI and WS	124	49	ACI	39	12.06	64.14	wet scrubber
CA901	NEI2CA151186	928,146	Precalciner	102.99	110.96	ACI and WS	101	40	ACI	32	12.06	52.28	wet scrubber
CO101	NEI446	522,496	Precalciner	114.75	219.62	ACI	103	22	ACI	18	0.00	5.00	None
CO201	NEI886	1,699,764	Precalciner	24.66	14.51	wet scrubber	20	153	RTO and scrubber	150	1.10	8.73	wet scrubber
CONEW1		1,000,000	Precalciner	110.96	110.96	ACI	100	20	ACI	16	12.06	56.3	None
FL101	NEIFLR053001	693,354	Preheater	136.74	197.22	ACI	123	30	ACI	24	0.00	5.00	None
FL102	NEIFLR053001	687,842	Preheater	147.45	214.37	ACI	133	29	ACI	23	0.00	5.00	None
FL201	NEIFLR001008	789,255	Precalciner	87.58	110.96	ACI and WS	86	34	ACI	27	12.06	44.46	wet scrubber
FL301	NEI26327	666,898	Preheater	74.00	110.96	ACI and WS	73	28	ACI	23	12.06	37.57	wet scrubber
FL302	NEI26327	896,179	Precalciner	99.44	110.96	ACI and WS	97	38	ACI	31	12.06	50.48	wet scrubber
FL401	NEI26277	1,092,391	Precalciner	121.21	110.96	ACI and WS	119	47	ACI	37	12.06	61.53	wet scrubber
FL501	NEIFL12100465	881,849	Precalciner	97.85	110.96	ACI and WS	96	10	ACI	8	12.06	49.68	wet scrubber
FL601	NEIFL0860020	1,897,078	Precalciner	210.50	110.96	ACI	189	49	ACI	39	0.00	5.00	None
FLNEW1		1,100,000	Precalciner	122.06	110.96	ACI and WS	120	20	ACI	16	12.06	62.0	wet scrubber
FLNEW2		750,000	Precalciner	83.22	110.96	ACI and WS	82	20	ACI	16	12.06	42.2	wet scrubber
GA201	NEIGA1530003	822,324	Preheater	91.25	110.96	ACI	82	35	ACI	28	0.00	5.00	None
IA101	NEIIA0330060	601,862	Dry	112.34	186.65	ACI and WS	110	13	ACI	10	12.06	33.90	wet scrubber
IA102	NEIIA0330060	385,809	Dry	77.98	202.11	ACI and WS	76	5	ACI	4	12.06	21.73	wet scrubber

IA201	NEI12238	1,074,754	Precalciner	130.72	121.63	ACI and WS	128	46	ACI	37	12.06	60.54	wet scrubber
IA301 *	NEIIA0330035	805,790	Precalciner	85.90	106.60	wet scrubber	69	81	RTO and scrubber	80	12.06	45.39	wet scrubber
ID101	NEIID0050004	126,766	Wet	3.11	24.53	ACI and WS	3	5	ACI	4	12.06	7.14	wet scrubber
ID102	NEIID0050004	159,835	Wet	3.56	22.27	ACI and WS	3	7	ACI	5	12.06	9.00	wet scrubber
IL101	NEI51435	625,011	Dry	50.72	81.15	ACI and WS	50	3	ACI	2	12.06	35.21	wet scrubber
IL201	NEI51527	175,267	Preheater	19.45	110.96	ACI and WS	19	7	ACI	6	12.06	9.87	wet scrubber
IL202	NEI51527	175,267	Preheater	19.45	110.96	ACI and WS	19	7	ACI	6	12.06	9.87	wet scrubber
IL203	NEI51527	175,267	Preheater	19.45	110.96	ACI and WS	19	7	ACI	6	12.06	9.87	wet scrubber
IL204	NEI51527	175,267	Dry	19.45	110.96	ACI and WS	19	7	ACI	6	12.06	9.87	wet scrubber
IL302	NEI51352	984,364	Precalciner	109.23	110.96	ACI	98	42	ACI	34	8.61	5.00	None
IL401	NEI52351	469,585	Dry	5.51	11.73	ACI and WS	5	20	ACI	16	12.06	26.45	wet scrubber
IL402	NEI52351	648,159	Dry	63.54	98.04	ACI and WS	62	28	ACI	22	12.06	36.51	wet scrubber
IN301	NEI31319	328,489	Dry	30.68	93.39	ACI and WS	30	14	ACI	11	12.06	18.50	wet scrubber
IN302	NEI31319	684,535	Dry	63.94	93.40	ACI and WS	63	29	ACI	23	12.06	38.56	wet scrubber
IN401	NEI32033	276,680	Preheater	29.01	104.85	ACI and WS	28	27	RTO and scrubber	27	12.06	15.59	wet scrubber
IN402	NEI32033	276,680	Preheater	31.20	112.76	ACI and WS	31	27	RTO and scrubber	27	12.06	15.59	wet scrubber
IN403	NEI32033	302,033	Preheater	35.98	119.11	ACI and WS	35	13	ACI	10	12.06	17.01	wet scrubber
KS401	NEI12739	432,106	Precalciner	47.95	110.96	ACI and WS	47	18	ACI	15	12.06	24.34	wet scrubber
KS402	NEI12739	339,512	Precalciner	37.67	110.96	ACI and WS	37	14	ACI	12	12.06	19.12	wet scrubber
KY101	NEIKYR0060	1,550,952	Precalciner	172.10	110.96	ACI and WS	169	66	ACI	53	12.06	87.37	wet scrubber
MD101	NEI33444	169,756	Wet	4.73	27.86	ACI and WS	5	7	ACI	6	12.06	9.56	wet scrubber
MD102	NEI33444	169,756	Wet	5.46	32.17	ACI and WS	5	7	ACI	6	12.06	9.56	wet scrubber
MD201	NEI33394	2,300,524	Precalciner	420.19	182.65	None	0	20	ACI	16	12.06	129.59	None
MD301	NEI33699	564,383	Dry	62.62	110.96	ACI and WS	61	24	ACI	19	12.06	31.79	wet scrubber
ME101	NEIME0130002	713,195	Precalciner	79.14	110.96	ACI	71	30	ACI	24	0.00	5.00	None
MI101	NEIMIB1559	1,360,252	Precalciner	150.94	110.96	ACI and WS	148	58	ACI	46	12.06	76.62	wet scrubber
MI201	NEIMIB1743	461,868	Wet	78.77	170.55	wet scrubber	63	694	RTO and scrubber	680	12.06	26.02	wet scrubber
MI202	NEIMIB1743	453,050	Wet	78.20	172.62	wet scrubber	63	681	RTO and scrubber	667	12.06	25.52	wet scrubber
MI301	NEI12018	368,172	Dry	31.65	85.96	ACI and WS	31	16	ACI	13	30.78	52.92	wet scrubber
MI302	NEI12018	368,172	Dry	32.76	88.99	ACI and WS	32	16	ACI	13	30.78	52.92	wet scrubber
MI303	NEI12018	370,377	Dry	33.75	91.14	ACI and WS	33	16	ACI	13	30.78	53.24	wet scrubber
MI304	NEI12018	641,545	Dry	67.54	105.28	ACI and WS	66	27	ACI	22	30.78	92.22	wet scrubber
MI305	NEI12018	658,080	Dry	69.12	105.03	ACI and WS	68	28	ACI	22	30.78	94.59	wet scrubber
MO201	NEIMO0990002	670,205	Dry	74.37	110.96	ACI and WS	73	29	ACI	23	12.06	37.75	wet scrubber
MO202	NEIMO0990002	670,205	Dry	74.37	110.96	ACI and WS	73	29	ACI	23	12.06	37.75	wet scrubber
MO302	NEI34520	1,056,014	Precalciner	117.18	110.96	ACI and WS	115	45	ACI	36	12.06	59.49	wet scrubber
MO501	NEI34326	1,018,536	Precalciner	59.25	58.17	ACI and WS	58	43	ACI	35	12.06	57.37	wet scrubber
MONEW1		4,400,000	Precalciner	488.23	110.96	ACI	439	20	ACI	16	1.55	31.8	lime injection
MONEW2		1,000,000	Precalciner	110.96	110.96	ACI and WS	109	20	ACI	16	12.06	56.3	wet scrubber
MT101	NEIMT0430001	329,591	Wet	8.29	25.14	None	0	0.27	ACI	0	0.00	5.00	None
MT201	NEIMT0310005	308,647	Wet	34.39	111.43	ACI	31	4	ACI	3	0.00	5.00	None
NE101	NEI572	351,637	Preheater	14.37	40.88	ACI and WS	14	15	ACI	12	24.70	40.56	wet scrubber
NE102	NEI572	607,374	Precalciner	34.85	57.38	ACI and WS	34	26	ACI	21	24.70	70.06	wet scrubber
NM101	NEINMT$12442	238,099	Preheater	26.42	110.96	ACI	24	10	ACI	8	0.00	5.00	None
NM102	NEINMT$12442	238,099	Preheater	26.42	110.96	ACI	24	10	ACI	8	0.00	5.00	None
NV101	NEI2NV410803	249,122	Dry	27.64	110.96	ACI	25	11	ACI	9	0.00	5.00	None

NV102	NEI2NV410803	249,122	Preheater	27.64	110.96	ACI	25	11	ACI	9	0.00	5.00	None
NVNEW1		500,000	Precalciner	55.48	110.96	ACI and WS	54	20	ACI	16	12.06	28.2	wet scrubber
NY101	NEINYT$1163	645,954	Preheater	87.92	136.11	ACI	79	28	ACI	22	0.00	5.00	None
NY201	NEI34931	933,658	Wet	72.71	77.87	ACI and WS	71	47	ACI	38	26.23	114.37	wet scrubber
NY202	NEI34931	932,555	Wet	69.32	74.33	ACI and WS	68	47	ACI	38	12.06	52.53	wet scrubber
NY301	NEINY4192600	630,522	Wet	69.96	110.96	ACI	63	27	ACI	22	9.11	5.00	None
OH101	NEIOHT$6526	728,628	Preheater	107.17	147.08	ACI and WS	105	31	ACI	25	12.06	41.04	wet scrubber
OK101	NEI12976	209,439	Dry	29.83	142.41	wet scrubber	24	73	RTO and scrubber	71	17.03	16.66	wet scrubber
OK102	NEI12976	209,439	Dry	26.21	125.15	wet scrubber	21	63	RTO and scrubber	61	17.03	16.66	wet scrubber
OK103	NEI12976	308,647	Dry	34.21	110.84	wet scrubber	27	77	RTO and scrubber	76	15.07	21.72	wet scrubber
OK201	NEIOK1826	277,782	Wet	22.82	82.16	ACI	21	12	ACI	9	1.42	1.84	lime injection
OK202	NEIOK1826	288,806	Wet	42.18	146.04	ACI	38	12	ACI	10	1.42	1.92	lime injection
OK301	NEIOK4013107	340,614	Dry	10.93	32.09	ACI and WS	11	15	ACI	12	12.06	19.19	wet scrubber
OK302	NEIOK4013107	319,670	Dry	10.44	32.66	ACI and WS	10	14	ACI	11	12.06	18.01	wet scrubber
OR101	NEI40539	985,466	Precalciner	3,219.89	3,267.38	ACI and WS	3,155	61	ACI	49	0.00	5.00	wet scrubber
PA101	NEIPA01993-1	145,505	Wet	16.15	110.96	ACI and WS	16	6	ACI	5	12.06	8.20	wet scrubber
PA102	NEIPA01993-1	145,505	Wet	16.15	110.96	ACI and WS	16	6	ACI	5	12.06	8.20	wet scrubber
PA201	NEIPA94-2626	262,350	Preheater	29.11	110.96	ACI and WS	29	11	ACI	9	12.06	14.78	wet scrubber
PA202	NEIPA94-2626	580,918	Precalciner	64.46	110.96	ACI and WS	63	25	ACI	20	12.06	32.72	wet scrubber
PA301	NEI46744	274,476	Dry	53.86	196.24	ACI and WS	53	12	ACI	9	12.06	15.46	wet scrubber
PA302	NEI46744	261,248	Dry	53.77	205.82	ACI and WS	53	11	ACI	9	12.06	14.72	wet scrubber
PA303	NEI46744	264,555	Dry	54.61	206.42	ACI and WS	54	11	ACI	9	12.06	14.90	wet scrubber
PA401	NEIPAT$1626	261,248	Wet	47.51	181.84	ACI and WS	47	11	ACI	9	12.06	14.72	wet scrubber
PA402	NEIPAT$1626	405,651	Wet	98.85	243.67	ACI and WS	97	17	ACI	14	12.06	22.85	wet scrubber
PA501	NEI7255	1,410,958	Preheater	168.70	119.56	ACI and WS	165	60	ACI	48	12.06	79.48	wet scrubber
PA701	NEIPA58-1290	461,868	Preheater	36.01	77.97	ACI and WS	35	8	ACI	6	12.06	26.02	wet scrubber
PA702	NEIPA58-1290	311,954	Preheater	23.98	76.86	ACI and WS	23	7	ACI	5	12.06	17.57	wet scrubber
PA801	NEI2PA110039	587,532	Preheater	40.48	68.90	ACI and WS	40	3	ACI	2	12.06	33.10	wet scrubber
PA802	NEI2PA110039	587,532	Preheater	40.48	68.90	ACI and WS	40	2	ACI	2	12.06	33.10	wet scrubber
PA901	NEIPA23-0797	123,458	Wet	8.26	66.95	ACI and WS	8	0.43	ACI	0.34	12.06	6.95	wet scrubber
PR101		652,568	Preheater	72.41	110.96	ACI and WS	71	28	ACI	22	12.06	36.76	wet scrubber
PR201		970,000	Precalciner	107.63	110.96	ACI and WS	105	41	ACI	33	12.06	54.64	wet scrubber
SC201	NEISC0351244	1,078,060	Precalciner	207.33	192.31	ACI and WS	203	46	ACI	37	14.30	71.99	wet scrubber
SD101	NEISDT$8989	154,324	Wet	17.12	110.96	ACI	15	7	ACI	5	0.00	5.00	None
SD102	NEISDT$8989	154,324	Wet	17.12	110.96	ACI	15	7	ACI	5	0.00	5.00	None
SD103	NEISDT$8989	660,284	Precalciner	73.27	110.96	ACI	66	28	ACI	23	0.00	5.00	None
TN101	NEITN0653070	899,486	Precalciner	99.81	110.96	ACI	90	38	ACI	31	0.00	5.00	None
TN201	NEITN0930008	756,186	Precalciner	230.60	304.95	ACI and WS	226	32	ACI	26	12.06	42.60	wet scrubber
TX1001	NEI13290	859,803	Precalciner	62.69	72.91	ACI and WS	61	37	ACI	29	12.06	48.43	wet scrubber
TX101	NEITXRBG0259	977,750	Precalciner	108.49	110.96	ACI	98	42	ACI	33	0.46	2.10	lime injection
TX1201	NEITXT$11924	1,264,351	Precalciner	140.29	110.96	ACI and WS	137	54	ACI	43	12.06	71.22	wet scrubber
TX1301	NEITX309123F	111,333	Wet	12.35	110.96	ACI and WS	12	5	ACI	4	12.06	6.27	wet scrubber
TX201	NEI7376	320,773	Wet	33.63	104.86	ACI and WS	33	14	ACI	11	12.06	18.07	wet scrubber
TX202	NEI7376	320,773	Wet	31.84	99.25	ACI and WS	31	14	ACI	11	12.06	18.07	wet scrubber
TX203	NEI7376	320,773	Wet	32.22	100.43	ACI and WS	32	9	ACI	7	12.06	18.07	wet scrubber
TX301	NEITXT$11980	159,835	Preheater	16.65	104.15	ACI and WS	16	7	ACI	5	12.06	9.00	wet scrubber

TX302	NEITXT$11980	159,835	Preheater	11.48	71.81	ACI and WS	11	7	ACI	5	12.06	9.00	wet scrubber
TX303	NEITXT$11980	180,779	Preheater	18.53	102.50	ACI and WS	18	11	ACI	9	12.06	10.18	wet scrubber
TX402	NEITXT$11872	608,476	Precalciner	67.52	110.96	ACI	61	26	ACI	21	0.34	0.97	None
TX501	NEIT$FNP1408	1,074,754	Precalciner	119.26	110.96	ACI and WS	117	46	ACI	37	12.06	60.54	wet scrubber
TX502	NEIT$FNP1408	1,237,896	Precalciner	137.36	110.96	ACI and WS	135	53	ACI	42	12.06	69.73	wet scrubber
TX601	NEITXT$12011	241,406	Dry	26.79	110.96	ACI	24	10	ACI	8	0.00	5.00	None
TX602	NEITXT$12011	272,271	Preheater	30.21	110.96	ACI	27	12	ACI	9	0.00	5.00	None
TX701 *	NEITX139099J	1,087,981	Precalciner	19.57	17.99	wet scrubber	16	112	RTO and scrubber	110	12.06	61.29	wet scrubber
TX702 *	NEITX139099J	1,133,176	Precalciner	41.42	36.55	wet scrubber	33	142	RTO and scrubber	139	44.00	232.84	wet scrubber
TX905 *	NEI13258	2,164,939	Precalciner	300.09	138.61	ACI and WS	294	25	ACI	20	12.06	121.95	wet scrubber
UT101	NEIUT10303	918,225	Precalciner	197.08	214.63	ACI	177	26	ACI	21	0.00	5.00	None
UT201	NEI42038	784,846	Precalciner	116.98	149.05	wet scrubber	94	82	RTO and scrubber	80	5.15	18.88	wet scrubber
VA101	NEIVA2553	1,247,816	Precalciner	138.46	110.96	ACI and WS	136	32	ACI	26	12.06	70.29	wet scrubber
WA101	NEIWA+B70331133	744,060	Precalciner	57.92	77.84	ACI	52	21	ACI	17	0.00	5.00	None
WA201	NEIWA0331404	419,981	Wet	65.40	155.73	ACI	59	18	ACI	14	0.00	5.00	None
WV101	NEIWV0030006	229,281	Wet	17.29	75.42	ACI and WS	17	10	ACI	8	12.06	12.92	wet scrubber
WV102	NEIWV0030006	229,281	Wet	19.98	87.15	ACI and WS	20	10	ACI	8	12.06	12.92	wet scrubber
WV103	NEIWV0030006	346,126	Wet	16.82	48.61	ACI and WS	16	15	ACI	12	12.06	19.50	wet scrubber
WVNEW1		700,000	Precalciner	77.67	110.96	ACI and WS	76	20	ACI	16	12.06	39.4	wet scrubber
WY101	NEI338	189,598	Dry	21.04	110.96	ACI and WS	21	8	ACI	6	12.06	10.68	wet scrubber
WY102		379,000	Precalciner	42.05	110.96	ACI and WS	41	19	ACI	15	12.06	24.90	wet scrubber
ALNEW1	NEIAL1150002	990,978	Precalciner	109.96	110.96	ACI and WS	108	20	ACI	16	12.06	73.2	wet scrubber
AZNEW1	NEIAZ0250421	1,176,166	Precalciner	130.51	110.96	ACI and WS	128	20	ACI	16	12.06	37.2	wet scrubber
AZNEW2	NEIAZ0250421	1,176,166	Precalciner	130.51	110.96	ACI and WS	128	20	ACI	16	12.06	107.0	wet scrubber
AZNEW3	NEIAZ0250421	1,176,166	Precalciner	130.51	110.96	ACI and WS	128	20	ACI	16	12.06	62.0	wet scrubber
GANEW1	NEIGA1530003	822,324	Preheater	91.25	110.96	ACI and WS	89	20	ACI	16	12.06	50.7	wet scrubber
ILNEW1	NEI52351	648,159	Dry	63.54	98.04	ACI and WS	62	20	ACI	16	12.06	102.9	wet scrubber
INNEW1	NEI32033	302,033	Preheater	35.98	119.11	ACI and WS	35	20	ACI	16	12.06	68.9	wet scrubber
NCNEW1	NEIMT0310005	308,647	Wet	34.39	111.43	ACI and WS	34	20	ACI	16	12.06	129.6	wet scrubber
PANEW1	NEIPA23-0797	123,458	Wet	8.26	66.95	ACI and WS	8	20	ACI	16	12.06	21.3	wet scrubber
				18,184.91			17,073	5,995		5,194		6,206	
							94%			87%			

HCl Emission Reduction after Org HAP Control (ton/yr)	PM 10 Baseline Emission rate (lb/ton clinker)	Total filterable PM (tpy)	PM Control with Org HAP control	PM Emission Reduction with Org HAP Control (tpy)	Baseline SO2 emissions (tpy)	SO2 reductions with Org HAP Control (tpy)
0.00	0.03	12.80	None	0	294	0
93.23	0.11	91.03	None	0	75	71
87.09	0.06	46.90	None	0	70	66
55.67	0.09	34.64	None	0	241	229
35.18	0.20	100.71	None	0	45	42
39.39	0.29	100.71	None	0	1,029	978
0.00	0.00	0.07	None	0	563	0
0.00	0.00	0.11	None	0	563	0
0.00	0.80	53.01	None	0	563	0
60.11	0.17	89.73	None	0	694	660
0.00	0.01	8.07	None	0	765	0
66.19	0.00	0.08	None	0	476	453
66.19	0.00	0.07	None	0	476	453
112.77	0.01	8.31	None	0	331	314
391.53	0.08	61.58	None	0	250	238
67.74	0.34	202.92	None	0	199	189
107.87	0.34	323.14	None	0	316	300
90.13	0.34	270.00	None	0	264	251
45.27	0.14	46.53	None	0	108	102
12.61	0.01	3.04	None	0	174	166
95.71	0.05	38.43	None	0	281	267
64.08	0.01	5.33	None	0	188	178
52.23	0.10	46.00	None	0	153	145
0.00	0.51	133.03	None	0	84	0
8.72	0.10	81.31	membrane bags	73	272	258
0.00	0.16	81.31	None	0	160	0
0.00	0.04	12.94	None	0	7	0
0.00	0.05	18.82	None	0	7	0
44.41	0.03	12.05	None	0	178	169
37.53	0.14	45.86	None	0	7	6
50.43	0.10	45.86	None	0	202	192
61.47	0.02	8.55	None	0	246	233
49.63	0.03	12.26	None	0	198	188
0.00	0.01	5.75	None	0	427	0
61.90	0.01	5.75	None	0	248	235
42.21	0.02	5.75	None	0	169	160
0.00	0.26	107.01	None	0	1,122	0
33.87	0.13	39.25	None	0	2,717	2,581
21.71	0.10	19.19	None	0	1,741	1,654

60.48	0.10	51.20	None	0	618	587
45.35	0.01	3.23	None	0	463	440
7.13	0.05	2.90	membrane bags	2	44	42
8.99	0.01	0.70	None	0	56	53
35.17	1.05	327.98	membrane bags	325	1,838	1,746
9.86	6.51	570.83	None	0	506	480
9.86	0.34	29.55	None	0	506	480
9.86	0.34	29.55	None	0	506	480
9.86	0.34	29.55	None	0	515	490
0.00	0.12	59.79	None	0	2,746	0
26.43	0.02	5.36	membrane bags	3	1,381	1,312
36.47	0.05	15.07	None	0	1,906	1,810
18.49	0.69	113.65	membrane bags	112	1,483	1,409
38.52	0.42	142.94	membrane bags	140	3,090	2,935
15.57	0.75	104.06	membrane bags	103	321	305
15.57	0.69	95.19	membrane bags	94	321	305
17.00	0.75	113.29	membrane bags	112	351	333
24.32	0.12	26.68	None	0	270	257
19.11	0.30	50.10	None	0	212	202
87.28	0.19	151.18	None	0	147	140
9.55	0.33	28.28	membrane bags	27	636	604
9.55	0.33	27.82	membrane bags	27	636	604
0.00	0.34	386.83	None	0	3,612	0
31.76	0.28	79.35	None	0	2,063	1,960
0.00	0.34	120.23	None	0	107	0
76.55	0.19	128.75	None	0	3,557	3,379
25.99	0.15	34.84	membrane bags	33	4,157	3,949
25.50	0.34	76.37	membrane bags	74	4,077	3,874
52.87	0.33	60.58	None	0	977	929
52.87	0.21	38.49	None	0	977	929
53.19	0.14	25.39	None	0	983	934
92.12	0.07	23.86	None	0	1,703	1,618
94.50	0.06	20.89	None	0	1,747	1,660
37.72	0.91	304.28	None	0	506	481
37.72	0.34	112.98	None	0	506	481
59.43	0.34	178.02	None	0	1,151	1,094
57.32	0.01	6.66	None	0	1,110	1,055
23.89	0.00	6.66	None	0	4,796	3,357
56.27	0.01	6.66	None	0	1,090	1,036
0.00	0.84	137.69	membrane bags	136	115	0
0.00	0.40	61.80	membrane bags	60	108	0
40.52	0.34	59.28	membrane bags	58	1,034	982
69.99	0.34	102.39	membrane bags	99	380	361
0.00	0.08	9.56	None	0	8	0
0.00	0.12	14.83	None	0	8	0
0.00	0.34	42.00	None	0	188	0

0.00	0.34	42.00	None	0	6	0
28.14	0.34	84.29	None	0	123	116
0.00	0.28	91.56	None	0	97	0
114.25	0.75	350.20	membrane bags	346	5,593	5,313
52.48	0.03	13.36	membrane bags	9	5,586	5,307
0.00	0.48	150.23	None	0	3,777	0
41.00	0.48	176.64	None	0	1,836	1,744
16.64	0.18	18.57	membrane bags	18	2,602	2,472
16.64	0.15	16.15	membrane bags	15	2,602	2,472
21.70	0.10	15.09	membrane bags	14	3,835	3,643
1.38	0.01	1.78	membrane bags	0	1,196	837
1.44	0.01	1.75	membrane bags	0	1,243	870
19.17	0.35	60.39	None	0	4,232	4,021
17.99	0.38	60.82	None	0	3,972	3,773
5.00	0.06	30.58	None	0	64	61
8.19	0.03	2.17	None	0	569	540
8.19	0.22	16.14	None	0	569	540
14.76	0.79	103.11	None	0	305	289
32.69	0.25	72.32	None	0	334	317
15.45	0.12	16.91	None	0	1,239	1,177
14.70	0.13	16.91	None	0	1,179	1,120
14.89	0.12	15.29	None	0	1,194	1,134
14.70	0.98	127.96	membrane bags	127	1,021	970
22.83	0.45	91.39	membrane bags	89	1,585	1,506
79.40	0.18	126.20	membrane bags	119	1,639	1,557
25.99	0.01	1.73	None	0	536	510
17.55	0.01	0.98	None	0	362	344
33.06	0.21	62.47	None	0	682	648
33.06	0.21	62.71	None	0	682	648
6.95	0.10	5.88	None	0	482	458
36.72	0.02	5.88	None	0	7	6
54.59	0.01	5.88	None	0	218	207
71.92	0.18	98.00	None	0	512	486
0.00	0.63	48.97	None	0	327	0
0.00	1.91	147.24	None	0	327	0
0.00	0.01	3.68	None	0	106	0
0.00	0.02	10.15	None	0	427	0
42.55	1.73	654.03	None	0	359	341
48.38	0.18	76.33	membrane bags	72	494	470
1.58	0.09	43.36	None	0	562	394
71.15	0.17	108.15	None	0	727	691
6.27	1.94	108.15	None	0	435	413
18.05	0.68	108.95	membrane bags	107	1,253	1,191
18.05	0.67	108.11	membrane bags	107	1,253	1,191
18.05	0.67	106.79	membrane bags	105	1,253	1,191
8.99	0.25	19.59	None	0	186	176

8.99	0.23	18.44	None	0	186	176	
10.17	0.22	20.09	None	0	210	199	
0.00	0.02	6.85	None	0	350	0	
60.48	0.22	116.79	None	0	618	587	
69.66	0.19	116.79	None	0	712	676	
0.00	0.34	40.69	None	0	1,090	0	
0.00	0.34	45.90	None	0	316	0	
61.23	0.22	122.29	membrane bags	117	626	594	
232.61	0.15	83.64	membrane bags	78	652	619	
121.83	0.08	91.65	None	0	1,245	1,183	
0.00	0.34	154.79	None	0	60	0	
18.86	0.04	15.51	membrane bags	12	51	48	
70.22	0.29	179.26	None	0	593	563	
0.00	0.08	31.14	None	0	197	0	
0.00	0.07	14.96	membrane bags	13	798	0	
12.90	0.05	5.82	membrane bags	5	859	816	
12.90	1.11	127.82	membrane bags	127	859	816	
19.48	0.02	4.25	membrane bags	3	1,296	1,231	
39.39	0.01	4.25	None	0	1,099	1,044	
10.67	0.34	31.96	None	0	101	96	
24.87	0.34	74.51	None	0	254	241	
73.16	0.34	219.15	None	0	59	56	
37.14	0.34	111.26	None	0	429	408	
106.92	0.34	320.29	None	0	1,235	1,173	
61.90	0.34	185.43	None	0	715	679	
50.65	0.34	151.72	None	0	1,229	1,167	
102.76	0.34	307.82	None	0	5,368	5,100	
68.88	0.34	206.33	None	0	1,422	1,351	
129.43	0.34	387.72	None	0	805	765	
21.33	0.34	63.8893916	None	0	1,481	1,407	
5,858		12,945		2,957	151,916	124,012	14,019
94.41%				23%		82%	

New kilns subject to NSPS

AZNEW3	Cal Portland	Rillito, AZ		Posponed
AZNEW2	Cemex	Seligman, AZ		2012
GANEW1	Houston Ame	Perry, GA		2012
INNEW1	Lehigh	Mitchell, IN		2012
NCNEW1	Titan America	Castle Hayne, NC		2012
ILNEW1	Lafarge	Gain Chain, IL		2013
ALNEW1	National Cem	Ragland, AL		2013

CEMS Cost	Capital ($)	Annual ($)
SO2	143,135	42,326
NOx	140,951	41,809
Flow meter	35,780	13,864

Cost to meet 1.33 lb SO2/ton clinker*

Unit	NEI ID	Clinker Production 2008 (t/yr)	Kiln Type	Baseline SO2 (lb/ton clinker)	Baseline SO2 (ton)	Removal efficiency required to meet 1.33 lb SO2/ton clinker (%)	Lime Injection TCI ($)	Wet Scrubber TCI ($)	Lime Injection TAC ($)	Wet Scrubber TAC ($)	SO2 CEMS First Cost ($)	Flow CEMS First Cost ($)	SO2 CEMS Annual Cost ($)	Flow CEMS Annual Cost ($)	Total Annual Costs ($)
ALNEW1		1,300,000	Precalciner	0.09	58.50	-1378	0	0	0	0	143,135	35,780	42,326	13,864	56,190
AZNEW2		1,900,000	Precalciner	1.30	1,235.00	-2	0	0	0	0	143,135	35,780	42,326	13,864	56,190
AZNEW3		1,100,000	Precalciner	1.30	715.00	-2	0	0	0	0	143,135	35,780	42,326	13,864	56,190
GANEW1		900,000	Precalciner	0.95	427.50	-40	0	0	0	0	143,135	35,780	42,326	13,864	56,190
ILNEW1		1,826,000	Precalciner	5.58	5,094.54	76	0	0	0	0	143,135	35,780	42,326	13,864	56,190
INNEW1		1,224,000	Precalciner	1.15	703.80	-16	0	0	0	0	143,135	35,780	42,326	13,864	56,190
NCNEW1		2,300,000	Precalciner	1.15	1,322.50	-16	0	0	0	0	143,135	35,780	42,326	13,864	56,190
															393,330

Cost to meet 0.4 lb SO2/ton clinker*

Unit	NEI ID	Clinker Production 2008 (t/yr)	Kiln Type	Baseline SO2 (lb/ton clinker)	Baseline SO2 (ton)	Removal efficiency required to meet 0.4 lb SO2/ton clinker (%)	Lime Injection TCI ($)	Wet Scrubber TCI ($)	Lime Injection TAC ($)	Wet Scrubber TAC ($)	SO2 CEMS First Cost ($)	Flow CEMS First Cost ($)	SO2 CEMS Annual Cost ($)	Flow CEMS Annual Cost ($)	Total Annual Costs ($)
ALNEW1		1,300,000	Precalciner	0.09	58.50	-344	0	0	0	0	143,135	35,780	42,326	13,864	56,190
AZNEW2		1,900,000	Precalciner	1.30	1,235.00	69	0	0	0	0	143,135	35,780	42,326	13,864	56,190
AZNEW3		1,100,000	Precalciner	1.30	715.00	69	0	0	0	0	143,135	35,780	42,326	13,864	56,190

GANEW1		900,000	Precalciner	0.95	427.50	58	0	0	0	0	143,135	35,780	42,326	13,864	56,190
ILNEW1		1,826,000	Precalciner	5.58	5,094.54	93	0	0	0	0	143,135	35,780	42,326	13,864	56,190
INNEW1		1,224,000	Precalciner	1.15	703.80	65	0	0	0	0	143,135	35,780	42,326	13,864	56,190
NCNEW1		2,300,000	Precalciner	1.15	1,322.50	65	0	0	0	0	143,135	35,780	42,326	13,864	56,190

393,330

Cost to meet 0.2 lb SO2/ton clinker*

Unit	NEI ID	Clinker Production 2008 (t/yr)	Kiln Type	Baseline SO2 (lb/ton clinker)	Baseline SO2 (ton)	Removal efficiency required to meet 0.2 lb SO2/ton clinker (%)	Lime Injection TCI ($)	Wet Scrubber TCI ($)	Lime Injection TAC ($)	Wet Scrubber TAC ($)	SO2 CEMS First Cost ($)	Flow CEMS First Cost ($)	SO2 CEMS Annual Cost ($)	Flow CEMS Annual Cost ($)	Total Annual Costs ($)
ALNEW1		1,300,000	Precalciner	0.09	58.50	-122	0	0	0	0	143,135	35,780	42,326	13,864	56,190
AZNEW2		1,900,000	Precalciner	1.30	1,235.00	85	0	0	0	0	143,135	35,780	42,326	13,864	56,190
AZNEW3		1,100,000	Precalciner	1.30	715.00	85	0	0	0	0	143,135	35,780	42,326	13,864	56,190
GANEW1		900,000	Precalciner	0.95	427.50	79	0	0	0	0	143,135	35,780	42,326	13,864	56,190
ILNEW1		1,826,000	Precalciner	5.58	5,094.54	96	0	0	0	0	143,135	35,780	42,326	13,864	56,190
INNEW1		1,224,000	Precalciner	1.15	703.80	83	0	0	0	0	143,135	35,780	42,326	13,864	56,190
NCNEW1		2,300,000	Precalciner	1.15	1,322.50	83	0	0	0	0	143,135	35,780	42,326	13,864	56,190

393,330

*Wet scrubbers are required for HCl control under the NESHAP; there are no additional control costs under the NSPS.

New kilns subject to NSPS

AZNEW3	Cal Portland	Rillito, AZ		Posponed
AZNEW2	Cemex	Seligman, AZ		2012
GANEW1	Houston Ame	Perry, GA		2012
INNEW1	Lehigh	Mitchell, IN		2012
NCNEW1	Titan America	Castle Hayne, NC		2012
ILNEW1	Lafarge	Gain Chain, IL		2013
ALNEW1	National Cem	Ragland, AL		2013

CEMS Cost	Capital ($)	Annual ($)
SO2	143,135	42,326
NOx	140,951	41,809
Flow meter	35,780	13,864

Cost to meet 1.95 lb NOX/ton clinker

Unit	NEI ID	Clinker Production 2008 (t/yr)	Kiln Type	Baseline NOX (lb/ton clinker)	Baseline NOX (ton)	Removal efficiency required to meet 1.95 lb NOX/ton clinker (%)	SNCR TCI ($)	SCR TCI ($)	SNCR TAC ($)	SCR TAC ($)	NOX CEMS First Cost ($)	Flow CEMS First Cost ($)	NOX CEMS Annual Cost ($)	Flow CEMS Annual ($)	Total Annual Cost ($)	CE ($/ton)
ALNEW1		1,300,000	Precalciner	2.50	1,625.00	22	2,288,000	0	663,000	0	140,951	35,780	41,809	13,864	718,673	
AZNEW2		1,900,000	Precalciner	2.50	2,375.00	22	3,344,000	0	969,000	0	140,951	35,780	41,809	13,864	1,024,673	
AZNEW3		1,100,000	Precalciner	2.50	1,375.00	22	1,936,000	0	561,000	0	140,951	35,780	41,809	13,864	616,673	
GANEW1		900,000	Precalciner	2.50	1,125.00	22	1,584,000	0	459,000	0	140,951	35,780	41,809	13,864	514,673	
ILNEW1		1,826,000	Precalciner	2.50	2,282.50	22	3,213,760	0	931,260	0	140,951	35,780	41,809	13,864	986,933	
INNEW1		1,224,000	Precalciner	2.50	1,530.00	22	2,154,240	0	624,240	0	140,951	35,780	41,809	13,864	679,913	
NCNEW1		2,300,000	Precalciner	2.50	2,875.00	22	4,048,000	0	1,173,000	0	140,951	35,780	41,809	13,864	1,228,673	
					13,187.50		18,568,000	0	5,380,500	0					5,770,211	438

Cost to meet 1.5 lb NOX/ton clinker

Unit	NEI ID	Clinker Production 2008 (t/yr)	Kiln Type	Baseline NOX (lb/ton clinker)	Baseline NOX (ton)	Removal efficiency required to meet 1.5 lb NOX/ton clinker (%)	SNCR TCI ($)	SCR TCI ($)	SNCR TAC ($)	SCR TAC ($)	NOX CEMS First Cost ($)	Flow CEMS First Cost ($)	NOX CEMS Annual Cost ($)	Flow CEMS Annual ($)	Total Annual Cost ($)	CE ($/ton)
ALNEW1		1,300,000	Precalciner	2.50	1,625.00	40	2,288,000	0	1,313,000	0	140,951	35,780	41,809	13,864	1,368,673	
AZNEW2		1,900,000	Precalciner	2.50	2,375.00	40	3,344,000	0	1,919,000	0	140,951	35,780	41,809	13,864	1,974,673	
AZNEW3		1,100,000	Precalciner	2.50	1,375.00	40	1,936,000	0	1,111,000	0	140,951	35,780	41,809	13,864	1,166,673	

GANEW1		900,000	Precalciner	2.50	1,125.00	40	1,584,000	0	909,000	0	140,951	35,780	41,809	13,864	964,673	
ILNEW1		1,826,000	Precalciner	2.50	2,282.50	40	3,213,760	0	1,844,260	0	140,951	35,780	41,809	13,864	1,899,933	
INNEW1		1,224,000	Precalciner	2.50	1,530.00	40	2,154,240	0	1,236,240	0	140,951	35,780	41,809	13,864	1,291,913	
NCNEW1		2,300,000	Precalciner	2.50	2,875.00	40	4,048,000	0	2,323,000	0	140,951	35,780	41,809	13,864	2,378,673	
					13,187.50		18,568,000	0	10,655,500	0	986,657	250,460	292,663	97,048	11,045,211	838

Cost to meet 0.5 lb NOX/ton clinker

Unit	NEI ID	Clinker Production 2008 (t/yr)	Kiln Type	Baseline NOX (lb/ton clinker)	Baseline NOX (ton)	Removal efficiency required to meet 0.5 lb NOX/ton clinker (%)	SNCR TCI ($)	SCR TCI ($)	SNCR TAC ($)	SCR TAC ($)	NOX CEMS First Cost ($)	Flow CEMS First Cost ($)	NOX CEMS Annual Cost ($)	Flow CEMS Annual ($)	Total Annual Cost ($)	CE ($/ton)
ALNEW1		1,300,000	Precalciner	2.50	1,625.00	80	0	5,941,000	0	3,250,000	140,951	35,780	41,809	13,864	3,305,673	
AZNEW2		1,900,000	Precalciner	2.50	2,375.00	80	0	8,683,000	0	4,750,000	140,951	35,780	41,809	13,864	4,805,673	
AZNEW3		1,100,000	Precalciner	2.50	1,375.00	80	0	5,027,000	0	2,750,000	140,951	35,780	41,809	13,864	2,805,673	
GANEW1		900,000	Precalciner	2.50	1,125.00	80	0	4,113,000	0	2,250,000	140,951	35,780	41,809	13,864	2,305,673	
ILNEW1		1,826,000	Precalciner	2.50	2,282.50	80	0	8,344,820	0	4,565,000	140,951	35,780	41,809	13,864	4,620,673	
INNEW1		1,224,000	Precalciner	2.50	1,530.00	80	0	5,593,680	0	3,060,000	140,951	35,780	41,809	13,864	3,115,673	
NCNEW1		2,300,000	Precalciner	2.50	2,875.00	80	0	10,511,000	0	5,750,000	140,951	35,780	41,809	13,864	5,805,673	
					13,187.50			48,213,500	0	26,375,000	986,657	250,460	292,663	97,048	26,764,711	2,030

Exhibit L

FACILITY AND KILN INFORMATION

PART 1 OF SECTION 114 ICR RESPONSE

JULY 28, 2009

FacID	KilnID	FacilityName	Street	City	State	Zip	FacStreet	FacCity	FacState	FacZip	MailStreet	MailCity	MailState	MailZip	ContactName	ContactTitle	ContactPhone	ContactEmail	AltContactName	AltContactTitle	AltContactPhone	AltContactEmail
28	1	Ash Grove Cement Company, Durkee, OR	11011 Cody	Overland Park	KS	66210	33060 Shirttail Creek Rd	Durkee	OR	97905	PO Box 287	Durkee	OR	97905	Robert Vantuyl	Corporate Environmental Manager	913-319-6063	bob.vantuyl@ashgrove.com				
27	1	Ash Grove Cement Company, Leamington, UT	11011 Cody	Overland Park	KS	66210	6 miles east of Leamington on Hwy 132	Leamington	UT	84638	PO Box 51	Nephi	UT	84648	Robert Vantuyl	Corporate Environmental Manager	913-319-6063	bob.vantuyl@ashgrove.com				
26	1	Ash Grove Cement Company, Louisville, NE	1101 Cody Street	Overland Park	KS	66210	16215 Highway 50	Louisville	NE	68037					Douglas M. Sweeney	Corporate Environmental Manager	913-319-6065	Doug.Sweeney@ashgrove.com				
26	2	Ash Grove Cement Company, Louisville, NE	1101 Cody Street	Overland Park	KS	66210	16215 Highway 50	Louisville	NE	68037					Douglas M. Sweeney	Corporate Environmental Manager	913-319-6065	Doug.Sweeney@ashgrove.com				
29	1	Ash Grove Cement Company, Montana City, MT	11011 Cody	Overland Park	KS	66210	100 Hwy 518	Clancy	MT	59634					Robert Vantuyl	Corporate Environmental Manager	913-319-6063	bob.vantuyl@ashgrove.com				
30	1	Ash Grove Cement Company, Seattle, WA	11011 Cody	Overland Park	KS	66210	3801 E. Marginal Way South	Seattle	WA	98134					Robert Vantuyl	Corporate Environmental Manager	913-319-6063	bob.vantuyl@ashgrove.com				
6	1	Ash Grove Inkom ID	11011 Cody	Overland Park	KS	66210	230 Cement Rd	Inkom	ID	83245					Robert Vantuyl	Corp Envt'l Manager	913-319-6063	bob.vantuyl@ashgrove.com				
6	2	Ash Grove Inkom ID	11011 Cody	Overland Park	KS	66210	230 Cement Rd	Inkom	ID	83245					Robert Vantuyl	Corp Envt'l Manager	913-319-6063	bob.vantuyl@ashgrove.com				
5	1	Ash Grove Texas, L.P.-Midlothian, TX	900 Gifco Road	Midlothian	TX	76065	900 Gifco Road	Midlothian	TX	76065	P.O. Box 520	Midlothian	TX	76065	Mr. Francisco Pinto	Envt'l Manager	972-723-7231	Francisco.Pinto@ashgrove.com				
5	2	Ash Grove Texas, L.P.-Midlothian, TX	900 Gifco Road	Midlothian	TX	76065	900 Gifco Road	Midlothian	TX	76065	P.O. Box 520	Midlothian	TX	76065	Mr. Francisco Pinto	Envt'l Manager	972-723-7231	Francisco.Pinto@ashgrove.com				
5	3	Ash Grove Texas, L.P.-Midlothian, TX	900 Gifco Road	Midlothian	TX	76065	900 Gifco Road	Midlothian	TX	76065	P.O. Box 520	Midlothian	TX	76065	Mr. Francisco Pinto	Envt'l Manager	972-723-7231	Francisco.Pinto@ashgrove.com				
58	K1	California Portland Cement Company--Colton, CA	2025 East Financial Way	Glendora	CA	91741	695 South Rancho Avenue	Colton	CA	92324	PO Box 947	Colton	CA	92324	Jay Grady		626-852-6262	jgrady@calportland.com				
58	K2	California Portland Cement Company--Colton, CA	2025 East Financial Way	Glendora	CA	91741	695 South Rancho Avenue	Colton	CA	92324	PO Box 947	Colton	CA	92324	Jay Grady		626-852-6262	jgrady@calportland.com				
59	K6	California Portland Cement Company--Mojave, CA	2025 East Financial Way	Glendora	CA	91741	9350 Oak Creek Road	Mojave	CA	93501					Jay Grady		626-852-6262	jgrady@calportland.com				
60	K1	California Portland Cement Company--Rillito, AZ	2025 East Financial Way	Glendora	CA	91741	11115 Casa Grande Highway	Rillito	AZ	85654	PO Box 338	Rillito	AZ	85654	Jay Grady		626-852-6262	jgrady@calportland.com				
60	K2	California Portland Cement Company--Rillito, AZ	2025 East Financial Way	Glendora	CA	91741	11115 Casa Grande Highway	Rillito	AZ	85654	PO Box 338	Rillito	AZ	85654	Jay Grady		626-852-6262	jgrady@calportland.com				
60	K3	California Portland Cement Company--Rillito, AZ	2025 East Financial Way	Glendora	CA	91741	11115 Casa Grande Highway	Rillito	AZ	85654	PO Box 338	Rillito	AZ	85654	Jay Grady		626-852-6262	jgrady@calportland.com				
60	K4	California Portland Cement Company--Rillito, AZ	2025 East Financial Way	Glendora	CA	91741	11115 Casa Grande Highway	Rillito	AZ	85654	PO Box 338	Rillito	AZ	85654	Jay Grady		626-852-6262	jgrady@calportland.com				
51	Kiln 1	CEMEX, Inc.--Brooksville FL	840 Gessner Rd #1400	Houston	TX	77024	16301 Ponce De Leon Blvd	Brooksville	FL	34614	16301 Ponce De Leon Blvd	Brooksville	FL	34614	Charles Walz	Environmental Manager, Brooksville	352-799-2011	Charles.Walz@cemex.com				
51	Kiln 2	CEMEX, Inc.--Brooksville FL	840 Gessner Rd #1400	Houston	TX	77024	16301 Ponce De Leon Blvd	Brooksville	FL	34614	16301 Ponce De Leon Blvd	Brooksville	FL	34614	Charles Walz	Environmental Manager, Brooksville	352-799-2011	Charles.Walz@cemex.com				
52	Kiln P003	CEMEX, Inc.--Fairborn, OH	3250 Linebaugh Road	Xenia	OH	45385	3250 Linebaugh Road	Xenia	OH	45385	3250 Linebaugh Road	Xenia	OH	45385	Janice Hartkorn	Environmental Specialist	937-879-8380	janicemary.hartkorn@cemex.com				
54	Kiln 1	CEMEX, Inc.--Lyons, CO	5134 _Ute Hwy; PO Box 529	Lyons	CO	80540	5134 _Ute Hwy; PO Box 529	Lyons	CO	80540	5134 _Ute Hwy; PO Box 529	Lyons	CO	80540	Gina Henry	Environmental Manager, Louisville			Monica Sowders	Environmental Manager, Lyons	303-823-2115	monica.sowders@cemex.usa
55	Kiln #1	CEMEX, Inc.--Wampum, PA	840 Gessner Road; Suite 1400	Houston	TX	77027	2001 Portland Park	Wampum	PA	16157	2001 Portland Park	Wampum	PA	16157	Melanie Lloyd	Environmental Manager	724-535-4311	Melanie.Lloyd@cemexusa.com				
55	Kiln #2	CEMEX, Inc.--Wampum, PA	840 Gessner Road; Suite 1400	Houston	TX	77027	2001 Portland Park	Wampum	PA	16157	2001 Portland Park	Wampum	PA	16157	Melanie Lloyd	Environmental Manager	724-535-4311	Melanie.Lloyd@cemexusa.com				
55	Kiln #3	CEMEX, Inc.--Wampum, PA	840 Gessner Road; Suite 1400	Houston	TX	77027	2001 Portland Park	Wampum	PA	16157	2001 Portland Park	Wampum	PA	16157	Melanie Lloyd	Environmental Manager	724-535-4311	Melanie.Lloyd@cemexusa.com				
53	Kiln 00K-01	CEMEX, Inc--Knoxville, TN	6212 Cement Plant Road	Knoxville	TN	37924	6212 Cement Plant Road	Knoxville	TN	37924	6212 Cement Plant Road	Knoxville	TN	37924	Kathy Sharp	Environmental Manager	865-541-5514	kathy.sharp@cemexusa.com				
33	Kiln 4	Essroc Cement Corporation, Bessemer, PA	3251 Bath Pike	Nazareth	PA	18064	15 Second Street	Bessemer	PA	16112					Dr. John Chadbourne	Environmental Engineer	610-837-3336	john.chadbourne@essroc.com				
33	Kiln 5	Essroc Cement Corporation, Bessemer, PA	3251 Bath Pike	Nazareth	PA	18064	15 Second Street	Bessemer	PA	16112					Dr. John Chadbourne	Environmental Engineer	610-837-3336	john.chadbourne@essroc.com				
36	Kiln 1	Essroc Cement Corporation, Dorado, PR	3251 Bath Pike	Nazareth	PA	18064	Road #2, KM 26.7, BO Espinosa	Dorado	PR	00646					Dr. John Chadbourne	Environmental Engineer	610-837-3336	john.chadbourne@essroc.com				
32	Kiln 1	Essroc Cement Corporation, Frederick, MD	3251 Bath Pike	Nazareth	PA	18064	4120 Buckeystown Pike	Frederick	MD	21703					Dr. John Chadbourne	Environmental Engineer	610-837-3336	john.chadbourne@essroc.com				
32	Kiln 2	Essroc Cement Corporation, Frederick, MD	3251 Bath Pike	Nazareth	PA	18064	4120 Buckeystown Pike	Frederick	MD	21703					Dr. John Chadbourne	Environmental Engineer	610-837-3336	john.chadbourne@essroc.com				
34	Kiln 7	Essroc Cement Corporation, Martinsburg, WV	3251 Bath Pike	Nazareth	PA	18064	1826 South Queen Street	Martinsburg	WV	25401					Dr. John Chadbourne	Environmental Engineer	610-837-3336	john.chadbourne@essroc.com				
34	Kiln 8	Essroc Cement Corporation, Martinsburg, WV	3251 Bath Pike	Nazareth	PA	18064	1826 South Queen Street	Martinsburg	WV	25401					Dr. John Chadbourne	Environmental Engineer	610-837-3336	john.chadbourne@essroc.com				
34	Kiln 9	Essroc Cement Corporation, Martinsburg, WV	3251 Bath Pike	Nazareth	PA	18064	1826 South Queen Street	Martinsburg	WV	25401					Dr. John Chadbourne	Environmental Engineer	610-837-3336	john.chadbourne@essroc.com				
35	Kiln 1	Essroc Cement Corporation, Nazareth, PA	3251 Bath Pike	Nazareth	PA	18064	Rt 248 & Easton Road	Nazareth	PA	18064					Dr. John Chadbourne	Environmental Engineer	610-837-3336	john.chadbourne@essroc.com				
37	Kiln 1	Essroc Cement Corporation, Speed, IN	3251 Bath Pike	Nazareth	PA	18064	301 East Highway 31	Speed	IN	47172					Dr. John Chadbourne	Environmental Engineer	610-837-3336	john.chadbourne@essroc.com				

FacID	KilnID	FacilityName	Street	City	State	Zip	FacStreet	FacCity	FacState	FacZip	MailStreet	MailCity	MailState	MailZip	ContactName	ContactTitle	ContactPhone	ContactEmail	AltContactName	AltContactTitle	AltContactPhone	AltContactEmail
37	Kiln 2	Essroc Cement Corporation, Speed, IN	3251 Bath Pike	Nazareth	PA	18064	301 East Highway 31	Speed	IN	47172					Dr. John Chadbourne	Environmental Engineer	610-837-3336	john.chadbourne@essroc.com				
43	Kiln 1	Holcim US Inc.--Ada, OK	201 Jones Rd	Waltham	MA	02451	14500 CR 1550	Ada	OK	74820	14500 CR 1550	Ada	OK	74820	Ruksana Mirza	VP, Environmental Affairs	781-647-2552	ruksana.mirza@holcim.com				
43	Kiln 2	Holcim US Inc.--Ada, OK	201 Jones Rd	Waltham	MA	02451	14500 CR 1550	Ada	OK	74820	14500 CR 1550	Ada	OK	74820	Ruksana Mirza	VP, Environmental Affairs	781-647-2552	ruksana.mirza@holcim.com				
44	Kiln 1	Holcim US Inc.--Devils Slide, UT	201 Jones Rd	Waltham	MA	02451	6055 E. Corydon Rd.	Morgan	UT	84050	6055 E. Corydon Rd.	Morgan	UT	84050	Ruksana Mirza	VP, Environmental Affairs	781-647-2552	ruksana.mirza@holcim.com				
45	Kiln 1	Holcim US Inc.--Dundee, MI	201 Jones Rd	Waltham	MA	02451	15215 Day Rd.	Dundee	MI	48131	PO Box 122	Dundee	MI	48131	Ruksana Mirza	VP, Environmental Affairs	781-647-2552	ruksana.mirza@holcim.com				
45	Kiln 2	Holcim US Inc.--Dundee, MI	201 Jones Rd	Waltham	MA	02451	15215 Day Rd.	Dundee	MI	48131	PO Box 122	Dundee	MI	48131	Ruksana Mirza	VP, Environmental Affairs	781-647-2552	ruksana.mirza@holcim.com				
46	Kiln 2	Holcim US Inc.--Mason City, IA	201 Jones Rd	Waltham	MA	02451	1840 North Federal Ave.	Mason City	IA	50401	1840 North Federal Ave.	Mason City	IA	50401	Ruksana Mirza	VP, Environmental Affairs	781-647-2552	ruksana.mirza@holcim.com				
46	Kiln 3	Holcim US Inc.--Mason City, IA	201 Jones Rd	Waltham	MA	02451	1840 North Federal Ave.	Mason City	IA	50401	1840 North Federal Ave.	Mason City	IA	50401	Ruksana Mirza	VP, Environmental Affairs	781-647-2552	ruksana.mirza@holcim.com				
50	Kiln 1	Holcim US Inc.--Midlothian, TX	1800 Dove Lane	Midlothian	TX	76065	1800 Dove Lane	Midlothian	TX	76065	1800 Dove Lane	Midlothian	TX	76065	Ruksana Mirza	VP, Environmental Affairs	781-647-2552	ruksana.mirza@holcim.com				
50	Kiln 2	Holcim US Inc.--Midlothian, TX	1800 Dove Lane	Midlothian	TX	76065	1800 Dove Lane	Midlothian	TX	76065	1800 Dove Lane	Midlothian	TX	76065	Ruksana Mirza	VP, Environmental Affairs	781-647-2552	ruksana.mirza@holcim.com				
47	Kiln 4	Holcim US Inc.--Portland, CO	201 Jones Rd	Waltham	MA	02451	3500 Highway 120	Florence	CO	81226	3500 Highway 120	Florence	CO	81226	Ruksana Mirza	VP, Environmental Affairs	781-647-2552	ruksana.mirza@holcim.com				
48	Kiln 1	Holcim US Inc.--Theodore, AL	201 Jones Rd	Waltham	MA	02451	3051 Hamilton Blvd.	Theodore	AL	36582	PO Box 649	Theodore	AL	36590	Ruksana Mirza	VP, Environmental Affairs	781-647-2552	ruksana.mirza@holcim.com				
49	Kiln 1	Holcim US Inc.--Trident, MT	201 Jones Rd	Waltham	MA	02451	4070 Trident Rd.	Three Forks	MT	59752	4070 Trident Rd.	Three Forks	MT	59752	Ruksana Mirza	VP, Environmental Affairs	781-647-2552	ruksana.mirza@holcim.com				
21	5	Lafarge Building Materials Inc., Calera, AL	12950 Worldgate Drive	Herndon	VA	20170	8039 Highway 25 West	Calera	AL	35040	PO Box 182	Calera	AL	35040	Travis J. Reed	Environment and Public Affairs Manager	205-337-2840	travis.reed@lafarge-na.com				
22	1	Lafarge Building Materials Inc., Ravena, NY	12950 Worldgate Drive; Suite 500	Herndon	VA	20170	Route 9W	Ravena	NY	12143	PO Box 3	Ravena	NY	12143	John Reagan	Environmental Manager	518-756-5026	john.reagan@lafarge-na.com				
22	2	Lafarge Building Materials Inc., Ravena, NY	12950 Worldgate Drive; Suite 500	Herndon	VA	20170	Route 9W	Ravena	NY	12143	PO Box 3	Ravena	NY	12143	John Reagan	Environmental Manager	518-756-5026	john.reagan@lafarge-na.com				
19	1	Lafarge Building Materials, Inc., Harleyville, SC	12950 Worldgate Drive	Herndon	VA	20170	463 Judge Street	Harleyville	SC	29448					Gary R. Fields	Environmental Manager	843-462-7651	gary.fields@lafarge-na.com				
39	Kiln 1	Lafarge Building Materials, Inc., Tulsa, OK	12950 Worldgate Drive	Herndon	VA	20170	2609 North 145th East Avenue	Tulsa	OK	74116					Pam Bennett	Environmental Manager	918-388-1471	pamela.bennett@lafarge-na.com				
39	Kiln 2	Lafarge Building Materials, Inc., Tulsa, OK	12950 Worldgate Drive	Herndon	VA	20170	2609 North 145th East Avenue	Tulsa	OK	74116					Pam Bennett	Environmental Manager	918-388-1471	pamela.bennett@lafarge-na.com				
38	19	Lafarge Midwest Inc., Alpena, MI	1435 Ford Ave.	Alpena	MI	49707	1435 Ford Ave.	Alpena	MI	49707					Bob Budnik		989-354-4171	robert.budnik@lafarge-na.com	Gil Peterson			gil.peterson@lafarge-na.com
38	20	Lafarge Midwest Inc., Alpena, MI	1435 Ford Ave.	Alpena	MI	49707	1435 Ford Ave.	Alpena	MI	49707					Bob Budnik		989-354-4171	robert.budnik@lafarge-na.com	Gil Peterson			gil.peterson@lafarge-na.com
38	21	Lafarge Midwest Inc., Alpena, MI	1435 Ford Ave.	Alpena	MI	49707	1435 Ford Ave.	Alpena	MI	49707					Bob Budnik		989-354-4171	robert.budnik@lafarge-na.com	Gil Peterson			gil.peterson@lafarge-na.com
38	22	Lafarge Midwest Inc., Alpena, MI	1435 Ford Ave.	Alpena	MI	49707	1435 Ford Ave.	Alpena	MI	49707					Bob Budnik		989-354-4171	robert.budnik@lafarge-na.com	Gil Peterson			gil.peterson@lafarge-na.com
38	23	Lafarge Midwest Inc., Alpena, MI	1435 Ford Ave.	Alpena	MI	49707	1435 Ford Ave.	Alpena	MI	49707					Bob Budnik		989-354-4171	robert.budnik@lafarge-na.com	Gil Peterson			gil.peterson@lafarge-na.com
25	K1	Lafarge Midwest Inc., Joppa, IL	2500 Portland Road	Joppa	IL	62941	2500 Portland Road	Joppa	IL	62941	2500 Portland Road	Grand Chain	IL	62941	Louis Derose	Environmental & Public Relations Manager	618-543-3925	louis.derose@lafarge-na.com				
25	K2	Lafarge Midwest Inc., Joppa, IL	2500 Portland Road	Joppa	IL	62941	2500 Portland Road	Joppa	IL	62941	2500 Portland Road	Grand Chain	IL	62941	Louis Derose	Environmental & Public Relations Manager	618-543-3925	louis.derose@lafarge-na.com				
18	3	Lafarge North America Inc., Sugar Creek, MO	12950 Worldgate Drive; Suite 500	Herndon	VA	20170	2200 North Courtney Road	Sugar Creek	MO	64050					Steve Kidwell	Manager, Environmental & Public Affairs	816-985-7049	steve.kidwell@lafarge-na.com				
20	K1	Lafarge North America, Inc, Davenport, IA	12950 Worldgate Drive; Suite 500	Herndon	VA	20170	301 East Front Street	Buffalo	IA	52728	PO Box 690	Buffalo	IA	52728	Scott Nielson	Environmental Manager	563-328-6206	scott.nielson@lafarge-na.com	Nalin Joshi	Environmental Coordinator	563-328-6204	nalin.joshi@lafarge-na.com
23	Kiln 1	Lafarge North America, Inc., Seattle, WA	12950 Worldgate Drive; Suite 500	Herndon	VA	20170	5400 West Marginal Way Southwest	Seattle	WA	96106					Travis Weide	Environmental & Public Affairs Manager	206-937-8025	travis.weide@lafarge-na.com				
24	Kiln 2	Lafarge North America, Inc., Whitehall, PA	12950 Worldgate Drive; Suite 500	Herndon	VA	20170	5160 Main Street	Whitehall	PA	18052					Vince Martin	Environmental and Public Relations Manager	610-261-3424	vincent.martin@lafarge-na.com				
24	Kiln 3	Lafarge North America, Inc., Whitehall, PA	12950 Worldgate Drive; Suite 500	Herndon	VA	20170	5160 Main Street	Whitehall	PA	18052					Vince Martin	Environmental and Public Relations Manager	610-261-3424	vincent.martin@lafarge-na.com				
17	005	Lehigh Cement, Leeds, AL	7660 Imperial Way	Allentown	PA	18195	8401 Second Avenue	Leeds	AL	35094					Valorie Moore	Environmental Manager	205-262-4147	vmoore@lehighcement.com				
9	8	Lehigh Cement, Mason City, IA	7660 Imperial Way	Allentown	PA	18195	700 25th Street N.W.	Mason City	IA	50401					Rita Dunn	Environmental Coordinator	641-421-3459	rdunn@lehighcement.com				
16	1	Lehigh Cement, Mitchell, IN	7660 Imperial Way	Allentown	PA	18195	121 North First Street	Mitchell	IN	47446	P.O. Box 97	Mitchell	IN	47446	Debbie Tolliver	Environmental Coordinator	812-849-2191	dtolliver@lehighcement.com				
16	2	Lehigh Cement, Mitchell, IN	7660 Imperial Way	Allentown	PA	18195	121 North First Street	Mitchell	IN	47446	P.O. Box 97	Mitchell	IN	47446	Debbie Tolliver	Environmental Coordinator	812-849-2191	dtolliver@lehighcement.com				
16	3	Lehigh Cement, Mitchell, IN	7660 Imperial Way	Allentown	PA	18195	121 North First Street	Mitchell	IN	47446	P.O. Box 97	Mitchell	IN	47446	Debbie Tolliver	Environmental Coordinator	812-849-2191	dtolliver@lehighcement.com				
13	E02-001	Lehigh Cement, Union Bridge, MD	7660 Imperial Way	Allentown	PA	18195	675 Quaker Hill Road	Union Bridge	MD	21791					Kurt Deery	Environmental Engineer	410-386-1229	kdeery@lehighcement.com	Tim Matz	Director Environmental Resources	610-366-4752	Tmatz@HTCnam.com
12	39	Lehigh Cement, Waco, TX	7660 Imperial Way	Allentown	PA	18195	100 South Wickson Rd.	Waco	TX	76702					Rafid Attisha	Environmental Compliance Supervisor	254-776-7162	rattisha@lehighcement.com				
14	White Cement Kiln	Lehigh Cement, York, PA	7660 Imperial Way	Allentown	PA	18195	200 Hokes Mill Road	York	PA	17404					Thomas Powers	Environmental & Safety Supervisor	717-843-0811	tpowers@lehighcement.com				
2	Kiln1	Lehigh Evansville PA	7660 Imperial Way	Allentown	PA	18195	537 Evansville Rd	Fleetwood	PA	19522					Charles Bortz	Envtl Coord	484-248-1391	cbortz@lehighcement.com				

FacID	KilnID	FacilityName	Street	City	State	Zip	FacStreet	FacCity	FacState	FacZip	MailStreet	MailCity	MailState	MailZip	ContactName	ContactTitle	ContactPhone	ContactEmail	AltContactName	AltContactTitle	AltContactPhone	AltContactEmail
2	Kiln2	Lehigh Evansville PA	7660 Imperial Way	Allentown	PA	18195	537 Evansville Rd	Fleetwood	PA	19522					Charles Bortz	Envtl Coord	484-248-1391	cbortz@lehighcement.com				
11	1	Lehigh Glens Falls, NY	313 Lower Warren St.	Glens Fall	NY	12801	313 Lower Warren St.	Glens Falls	NY	12801	PO Box 440	Glens Falls	NY	12801	Jeremy Tatarzyn	Kiln Engineer	518-792-1137	jtatarzyn@lehighcement.com				
15	Kiln	Lehigh Southwest Cement, Tehachapi, CA	13573 Thachapi Blvd.	Tehachapi	CA	93561	13573 Tehachapi Blvd.	Tehachapi	CA	93561					David Whitney	Environmental Engineer	661-822-4445	dwhitney@lehighcement.com				
10	1	Lehigh Southwest, Redding, CA	2300 Clayton Road, Suite 300	Concord	CA	94520	15390 Wonderland Blvd.	Redding	CA	96003					Michael Meinen	Environmental Engineer	530-275-1581	mmeinen@lehighcement.com				
40	1	Lone Star Industries dba Buzzi Unicem USA--Maryneal	PO Box 1639	Sweetwater	TX	79556	202 CR 306	Maryneal	TX	79535	PO Box 1639	Sweetwater	TX	79556	Daniel B. Nugent	Vice President, Environmental Affairs	610-882-5000	daniel.nugent@buzziunicemusa.com				
40	2	Lone Star Industries dba Buzzi Unicem USA--Maryneal	PO Box 1639	Sweetwater	TX	79556	202 CR 306	Maryneal	TX	79535	PO Box 1639	Sweetwater	TX	79556	Daniel B. Nugent	Vice President, Environmental Affairs	610-882-5000	daniel.nugent@buzziunicemusa.com				
40	3	Lone Star Industries dba Buzzi Unicem USA--Maryneal	PO Box 1639	Sweetwater	TX	79556	202 CR 306	Maryneal	TX	79535	PO Box 1639	Sweetwater	TX	79556	Daniel B. Nugent	Vice President, Environmental Affairs	610-882-5000	daniel.nugent@buzziunicemusa.com				
41	3	Lone Star Industries dba Buzzi Unicem USA--Oglesby	PO Box 130	Oglesby	IL	61348	490 Portland Avenue	Oglesby	IL	61348	490 Portland Avenue	Oglesby	IL	61348	Daniel B. Nugent	Vice President, Environmental Affairs	610-882-5000	daniel.nugent@buzziunicemusa.com				
42	1	Lone Star Industries dba Buzzi Unicem USA--Pryor	PO Box 68	Pryor	OK	74362	2430 South 437	Pryor	OK	74362	PO Box 68	Pryor	OK	74362	Daniel B. Nugent	Vice President, Environmental Affairs	610-882-5000	daniel.nugent@buzziunicemusa.com				
42	2	Lone Star Industries dba Buzzi Unicem USA--Pryor	PO Box 68	Pryor	OK	74362	2430 South 437	Pryor	OK	74362	PO Box 68	Pryor	OK	74362	Daniel B. Nugent	Vice President, Environmental Affairs	610-882-5000	daniel.nugent@buzziunicemusa.com				
42	3	Lone Star Industries dba Buzzi Unicem USA--Pryor	PO Box 68	Pryor	OK	74362	2430 South 437	Pryor	OK	74362	PO Box 68	Pryor	OK	74362	Daniel B. Nugent	Vice President, Environmental Affairs	610-882-5000	daniel.nugent@buzziunicemusa.com				
57	Kiln 1-DE-3	TXI Operations, LP--Hunter, TX	1341 W Mockingbird Ln., STE 700W	Dallas	TX	75247	7781 FMR 1102	New Braunfels	TX	78132	7781 FMR 1102	New Braunfels	TX	78132	Soc Lindholm		512-396-4244	slindholm@txi.com				
56	Kiln E2-22	TXI Operations, LP--Midlothian, TX	1341 W Mockingbird Ln., STE 700W	Dallas	TX	75247	245 Ward Road	Midlothian	TX	76065	PO Box 1170	Midlothian	TX	76065	Nancy Garnett	Enrivonmental Manager--Central Region Cement	972-647-3414	ngarnett@txi.com				

FacID	KilnID	PMControl
2	Kiln1	fabric filter
2	Kiln2	fabric filter
5	1	cold-side electrostatic precipitator (ESP)
5	2	cold-side electrostatic precipitator (ESP)
5	3	cold-side electrostatic precipitator (ESP)
6	1	cold-side electrostatic precipitator (ESP)
6	2	cold-side electrostatic precipitator (ESP)
9	8	cold-side electrostatic precipitator (ESP)
10	1	fabric filter
11	1	cold-side electrostatic precipitator (ESP)
12	39	fabric filter
13	E02-001	fabric filter
14	White Cement Kiln	cold-side electrostatic precipitator (ESP)
15	Kiln	fabric filter
16	1	cold-side electrostatic precipitator (ESP)
16	2	cold-side electrostatic precipitator (ESP)
16	3	cold-side electrostatic precipitator (ESP)
17	005	fabric filter
18	3	dust collector
19	1	fabric filter
20	K1	fabric filter
21	5	fabric filter
22	1	cold-side electrostatic precipitator (ESP)
22	2	cold-side electrostatic precipitator (ESP)
23	Kiln 1	cold-side electrostatic precipitator (ESP)
24	Kiln 2	fabric filter
24	Kiln 3	fabric filter
25	K1	cold-side electrostatic precipitator (ESP)
25	K2	fabric filter
26	1	cold-side electrostatic precipitator (ESP)
26	2	cold-side electrostatic precipitator (ESP)
27	1	fabric filter
28	1	fabric filter
29	1	cold-side electrostatic precipitator (ESP)
30	1	fabric filter
32	Kiln 1	cold-side electrostatic precipitator (ESP)
32	Kiln 2	cold-side electrostatic precipitator (ESP)
33	Kiln 4	cold-side electrostatic precipitator (ESP)
33	Kiln 5	cold-side electrostatic precipitator (ESP)
34	Kiln 7	cold-side electrostatic precipitator (ESP)
34	Kiln 8	cold-side electrostatic precipitator (ESP)
34	Kiln 9	cold-side electrostatic precipitator (ESP)
35	Kiln 1	fabric filter
36	Kiln 1	fabric filter
37	Kiln 1	cold-side electrostatic precipitator (ESP)
37	Kiln 2	cold-side electrostatic precipitator (ESP)
38	19	fabric filter
38	20	fabric filter
38	21	fabric filter
38	22	fabric filter
38	23	fabric filter
39	Kiln 1	fabric filter
39	Kiln 2	fabric filter
40	1	fabric filter

FacID	KilnID	PMControl
40	2	fabric filter
40	3	fabric filter
41	3	Electrostatic Precipitator (ESP)
42	1	fabric filter
42	2	fabric filter
42	3	fabric filter
43	Kiln 1	Electrostatic Precipitator (ESP)
43	Kiln 2	Electrostatic Precipitator (ESP)
44	Kiln 1	fabric filter
45	Kiln 1	fabric filter
45	Kiln 2	fabric filter
46	Kiln 2	fabric filter
46	Kiln 3	fabric filter
47	Kiln 4	fabric filter
48	Kiln 1	fabric filter
49	Kiln 1	Electrostatic Precipitator (ESP)
50	Kiln 1	fabric filter
50	Kiln 2	fabric filter
51	Kiln 1	fabric filter
51	Kiln 2	fabric filter
52	Kiln P003	fabric filter
53	Kiln 00K-01	fabric filter
54	Kiln 1	fabric filter
55	Kiln #1	None
55	Kiln #2	None
55	Kiln #3	None
56	Kiln E2-22	fabric filter
57	Kiln 1-DE-3	Electrostatic Precipitator (ESP)
58	K1	fabric filter
58	K2	fabric filter
59	K6	fabric filter
60	K1	fabric filter
60	K2	fabric filter
60	K3	fabric filter
60	K4	fabric filter