

# Cement Industry Readiness Check for Upgraded Environmental Regulations: Final Actions to Implement the Latest MACT, NSPS, and Alternative Fuel Requirements

Carrie Yonley and Mike Remsberg

**Abstract**—As the rulemaking compliance dates come further into effect in 2015, U.S. cement plants will take final actions to upgrade compliance programs for the National Emission Standards for Portland Cement Manufacturing [also known as the Portland Cement Maximum Achievable Control Technology (PC MACT)]. For those facilities using alternative fuels and possibly raw materials, past practices will also require altering to address the non-hazardous secondary material (NHSM) and Commercial and Industrial Solid Waste Incineration (CISWI) rules. Meanwhile, there is continued work by the industry and the U.S. Environmental Protection Agency (EPA) to decipher and clarify final implementation steps of each rule and, in particular, to address the question of “what is a waste,” which drives facility implementation strategies. The Portland cement industry has a long and proven track record in historically implementing the PC MACT rules and in using alternative fuels and raw materials (AFR) for a variety of environmentally and economically beneficial reasons. As the final compliance steps are put in place, there are continuing questions on how the new rules will be successfully implemented, while optimizing plant operations and continuing to grow the important AFR programs. Given that this suite of regulations will forever change the playing field on day-to-day operations, and the historic use of AFR in cement plants in the U.S., there will be critical compliance and financial risk implications on how to best manage final decisions. This paper reviews final approaches for cement plant operators to maximize opportunities and reduce unintentional risks posed by the new rules, by exploring the lessons learned on implementing PC MACT, CISWI, and NHSM rules based on the authors’ work with the Portland Cement Association, individual facilities, and general industry/EPA discussions.

**Index Terms**—Air pollution, cement industry, environmental management-pollution control, fuels.

## I. INTRODUCTION

THE U.S. cement industry has had a long history of adapting plant operations to new and modified environmental rules, and 2015 is another one of those significant regulatory transition years for the industry. In the key regulatory changes,

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spotlight this year are the final actions to implement the upgraded Portland Cement Maximum Achievable Control Technology (PC MACT) rules, as well as the need to finalize the new additional documentation approach for alternative fuels necessitated by the Resource Conservation and Recovery Act non-hazardous secondary material (RCRA-NHSM) rule and/or the need to plan for Commercial and Industrial Solid Waste Incineration (CISWI) compliance, depending on each facility’s alternative fuel program plans.

Addressing the 2015 actions requires a site-specific strategy that proceeds from an initial decision regarding the use of alternative fuels. Each site-specific strategy includes the use of detailed timelines, action lists and approaches to roll out the engineering, operational, and administrative responsibilities necessary to implement the new approach in full compliance with the applicable regulations.

Considerations are provided in this paper for both PC MACT and CISWI facilities, providing a readiness check format for facilities to gauge against their final regulatory implementation actions for the new rules. A few U.S. facilities have their kiln systems covered under the Hazardous Waste Combustor (HWC) MACT rules instead of PC MACT or CISWI. The HWC MACT rules are not being modified on the same schedule as PC MACT and CISWI and therefore are not covered in this paper. However, the nonkiln systems at these facilities are also covered by PC MACT; thus, these provisions apply to all U.S. cement facilities at least in part.

This paper is organized to first walk through the PC MACT readiness check actions and then the CISWI kiln system preparatory actions for facilities accepting non-hazardous solid waste. The additional actions to finalize the programmatic approach to address NHSM documentation for PC MACT facilities using alternative fuel are also reviewed. For a more in-depth understanding of the underlying decision of whether a facility’s kiln system will be regulated in the future scenario under PC MACT or CISWI, the intertwining regulatory path and decision-making approach can be reviewed in [1].

## II. OVERALL READINESS CHECK: THE TIMELINE

On September 9, 2015, all existing U.S. cement manufacturing facilities are to have implemented the portions of the upgraded PC MACT rules that are applicable to their facilities.

Facilities are currently in the process of transitioning from implementing the 1999 original PC MACT rule<sup>1</sup> to the 2013 final rules [2] (which updated the substantially upgraded 2010 version of the rule [3]). Since the implementation date is 2015, we will generally refer to the “2015 rule.”

While all of the planning and activities are rolling out to finalize each facility’s implementation approach, one thing that is consistent with other regulatory rollouts is that the regulations are still under litigation and continuing to be modified and clarified by the U.S. Environmental Protection Agency (EPA). Most recently, the EPA has published a November 14, 2014 PC MACT proposed rule to address and clarify certain provisions, and a separate CISWI rule reconsideration proposal followed closely with a prepublication version released on December 1, 2014.

In order to implement the combination of upgraded requirements, there are a number of areas to address to fit together the regulatory program components. First, for the plant sources other than the kiln system, the PC MACT rules apply to most sources at each facility, as they have in the past. As an example, if a cement plant has an on-site nonmetallic mineral processing facility, then those sources remain excluded from the PC MACT requirements. However, for area sources, the rule covers additional sources, such as the particulate matter (PM) standard for clinker coolers and the total hydrocarbon (THC) standard for raw material dryers. The main regulatory change to the applicable requirements for raw and finish mills and bins and transfer points is the increase of the Method 22 test from 1 to 10 minutes per visual observation. The clinker pile regulatory requirements added in the rule were already implemented early in 2014. The industry is down to a few last months to implement the rest of the PC MACT requirements, unless a facility applies for and is granted a compliance extension.

Focusing on the kiln system(s), each kiln is now subject to one of three major air emission rules (PC MACT, CISWI, or HWC MACT) depending on fuel type, whereas there were only two types in the past, with most U.S. kilns being regulated under PC MACT. The regulatory language allows facilities to change regulatory classification between rules, with some limitation and conditions. For example, a PC MACT facility can become an immediate CISWI facility, but a CISWI facility can only revert to PC MACT six months after the last solid waste is accepted. The ability to change may be critical for some facilities, as lessons are learned on the new rules and facilities further decipher their modified regulatory scenario.

- PC MACT Kiln (40 CFR 63 Subpart LLL): This is the category of facilities that accepts traditional fuels only, or traditional fuels plus alternative fuel documented *not* to be solid waste.
- CISWI Rule (40 CFR 60 Subparts CCCC [new source standards] and DDDD [existing source guideline]): This is the category of facilities that accepts non-hazardous alternative fuels (i.e., a facility is regulated under CISWI

unless they maintain documentation to demonstrate that only alternative fuels that can be documented *not* to be solid waste are accepted), e.g., traditional fuels plus alternative fuel that is solid waste or nonsolid waste.

- HWC MACT Kiln (40 CFR 63 Subpart EEE): Facilities that are also permitted under RCRA and are permitted to use traditional fuels and alternative fuels that are non-hazardous or hazardous waste.

Preparing the applicable compliance program and documentation details for the correct PC MACT versus CISWI regulatory status is critical, and the timeline for each of these regulatory scenarios is different. For CISWI and HWC MACT-regulated kiln systems, implementation of the PC MACT upgrades is still required for the September 9, 2015 compliance date.

Conceptual overall timeline considerations for the PC MACT and CISWI regulatory scenarios are explained as follows.

#### 1) PC MACT 2015

- The September 9, 2015 compliance date is the latest date to implement all of the regulatory additions and changes for kiln systems and other sources, unless a facility has received a compliance extension.
- Pre-testing of new air pollution control and instrumentation performance is recommended prior to the compliance date.
- Continuous emission monitoring system (CEMS)-monitored pollutants require a 30-day compliance test starting the day after the compliance date (and once the instrumentation performance evaluation is complete).
- While being in continuous compliance, the facility has up to 180 days (per Subpart A, 40 CFR Part 63.7 and 63.8) to document compliance through stack emission testing and concurrent establishment of operating limits for non-CEMS-monitored pollutants.
- Corollary New Source Performance Standards (NSPS), Subpart F upgrades must also be considered for some facilities for standards, such as NO<sub>x</sub> and SO<sub>x</sub>, that are not otherwise covered by the PC MACT rule.

#### 2) CISWI Facility

- For existing sources that plan to comply with CISWI versus PC MACT, the (latest) compliance date is February 7, 2018 (40 CFR Subpart DDDD).
- Any facility planning to comply with CISWI instead of PC MACT for the kiln system still needs to comply with the PC MACT upgrades by September 9, 2015, for non-kiln applicable sources.
- CISWI facilities need to ensure that any modification made to the facility prior to 2018 does not trigger the CISWI NSPS modification, reconstruction, or construction definitions, *or*, the compliance date would move up, with the facility being immediately subject to the new source CISWI rules (40 CFR 60 Subpart CCCC), which are already effective. All facilities need to track NSPS modification provisions, and the CISWI rules add another reason to carefully track and prevent unplanned modifications between now and the applicable CISWI compliance date, and into the future.

<sup>1</sup>The 1999 rules required existing cement kilns at that time comply in 2002.

### 3) Alternative Fuel/NHSM Rule Documentation Requirements

- Recordkeeping to document that alternative fuels are not solid waste under the RCRA-NHSM rule needs to be kept as soon as March 9, 2015, for facilities to clearly document their PC MACT versus CISWI status to follow the best path for regulatory updates. This date is six months prior to the PC MACT compliance date, to accommodate the six-month window in the rule for fuel switching and in the definition of waste-burning kiln.
- Facilities operating PC MACT kilns that use alternative fuel must keep documentation for how it is not solid waste (in accordance with the NHSM rules), or the kiln is a CISWI source by definition, with the existing source CISWI rules being implemented by February 2018.
- RCRA-NHSM documentation is not necessarily required for CISWI facilities since they can accept alternative fuels that are solid waste, but “waste tracking” provisions will be required as part of the future CISWI implementation. Note that facilities will be able to fuel switch, such that the kiln regulatory requirements can change from PC MACT to CISWI and vice versa; thus, the type of documentation needed would change at that point.
- The final rule excluded alternative raw materials (“ingredients”) that are fed to the process anywhere except in the flame zone of the kiln or calciner (per CISWI rule definition of waste-burning kiln). The EPA interpretive letter on this subject also referred to the inert nature of raw materials (in this case, insufflated cement kiln dust), and how that still was not considered combustion when fed to the kiln combustion zone. There will likely be only very limited cases where an alternative raw material is not exempt. If a situation arises where the NHSM evaluation is needed, the processing requirements would only be applicable when the subject ingredient was previously discarded (e.g., landfilled) and later recovered, which is not considered the case for most alternative raw materials. The ingredient legitimacy criteria, which need only be addressed if an NHSM evaluation is indicated, include the following:

- managed as a valuable commodity;
- contributes to the process; and
- comparable constituents in the product.

### III. OVERALL IMPLEMENTATION ACTIONS: THE READINESS CHECK

In order to review the new rule actions that facilities must prepare for and implement, the following section of this paper is organized by topic categories. For each topic, a summary of information surrounding the topic is provided based on some historical and current industry practices. The actions, as with any new/modified MACT or NSPS rule implementation program, range from having new air pollution control equip-

ment and instrumentation installed and operational to having the detailed plans and recordkeeping program upgraded for all the new actions. There are other combustion facilities such as power plants and boilers that are also simultaneously implementing new and upgraded MACT requirements, thus putting more demands on the same equipment and support personnel. With this heightened general demand, longer backlogs and turnarounds are possible, which can also impact costs. Planning ahead and having a realistic implementation timeline will help minimize challenges to your compliance program.

#### A. PC MACT Readiness Check

*1) Implementing the New and Revised Emission Standards:* Facilities have been working for the last few years to derive site-specific methods to meet the standards, where new standards are not already achievable. With changes to the PM standards, and the addition of Hg, THC, and HCl standards, and their various compliance options, there are a number of challenges that facilities have been working through to ensure continuous compliance with the emission limitations. Changes that facilities are implementing can include operational changes, raw material changes, and/or new or augmented control systems at some facilities for some hazardous air pollutants (HAPs)/surrogates.

The upgraded rules include many different options and regulatory approaches depending on the site-specific facility configuration. Establishing the site-specific methodology for demonstrating compliance with the standards, much less all of the associated compliance requirements, is a significant challenge for facility planning. A few considerations on the upgraded standards are explained as follows:

- Hg, THC, and HCl are generally intended to be CEMS monitored (at all facilities for Hg and THC and at facilities without a scrubber for HCl); thus, planning for instrumentation operations on a continual basis is key.
- For PM, the THC alternative [organic HAPs (OHAPs)], and the SO<sub>2</sub> CEMS alternate monitoring method for HCl, site-specific operating limits will be established during the stack emission compliance testing. Subsequent operations need to be in continuous compliance, by operating the corresponding process monitor and tracking its performance against the established limit.
- The PM standard correlation with a continuous parameter monitoring system (CPMS) will be used for compliance in lieu of a PM CEMS. The PM standard was revised to be based on clinker versus feed or a feed:clinker ratio.

This dual-tracking approach creates a new paradigm for many operating facilities. There are pollutant-specific challenges to how the testing is performed, combined with process-specific challenges to establishing and tracking an operating limit. The key is to have worked through process specifics to determine the range of operations encountered over a year or longer period of time early in the process (i.e., before you must set formal, final, and enforceable limitations). By critically planning the testing and operating limit regime for your plant,

a facility can work toward creating limits that allow flexibility for longer term operations, in order to prevent a higher level of testing should the limits not create a wide enough operating range or reduce the risk of setting operating limits that restrict production or increase deviations and/or noncompliance. Another consideration is establishing the operating limits for potentially multiple parameters simultaneously during testing, in order to better enable a more flexible operating envelope. Detailed planning for testing versus process operating needs is a critical component of planning for implementing the new rule.

Meanwhile, there is another significant change with implementing the 2015 PC MACT rule, i.e., the change that requires compliance *at all times*, rather than during periods other than startup, shutdown, and malfunction (SSM). In the prior PC MACT rules, each facility has operated under an SSM plan that describes operations and the corresponding regulatory scenario during SSM periods. There were effectively no enforceable emission limitations during these periods. Starting with the 2015 rule implementation, there are work practice standards in lieu of emission limits to be implemented during startup and shutdown for the kiln system, with those time periods specifically defined in the upgraded rules. For other sources, compliance will be at all times, with no exceptions for SSM. Facilities will need to adapt to operations, under this significantly different approach, and will need to address SSM quite differently than in the past.

For cement plants that will need to modify equipment or enhance or add controls, care and planning should be given to ensuring that any permits or permit modifications are obtained prior to implementing those projects. Furthermore, facilities should also proactively review current permit limits for pollutants that the upgraded PC MACT rule might now also be regulating, in order to ensure that conflicts between requirements can be avoided.

2) *Instrumentation and DAS Upgrades, Additions, and Instrument Performance Evaluations*: Facilities are currently installing upgrades and instrumentation additions, in order to have experience operating the new instrumentation by the 2015 compliance date. The overall instrumentation regime in the 2015 rule includes the following:

- *Continuous monitoring system (CMS)*: comprehensive term that may include, but is not limited to, CEMS, COMS, CPMS, or other manual or automatic monitoring used for demonstrating compliance on a continuous basis as defined by LLL;
- *Continuous emission monitoring system (CEMS)*: total equipment that may be required to meet LLL data acquisition and availability requirements, used to sample, condition (if applicable), analyze, and provide record of emissions;
- *Continuous opacity monitoring system (COMS)*: continuous monitoring system that measures opacity of emissions;
- *Continuous parameter monitoring system (CPMS)*: total equipment that may be required to meet LLL data acquisition and availability requirements, which is used to sample, condition (if applicable), analyze, and provide record of process or control system parameters.

Because these instruments and the data they record become the compliance point, they are a critical part of the regulatory program. A few considerations are explained as follows:

- Monitors must be collecting data at virtually all times unless they are in an out-of-control period, which can include certain downtime such as during calibrations or malfunction period (note that this is a different use of the malfunction term than the operating equipment malfunction discussed for the kiln system). The data do not have to be collected or included in the averaging calculations during these periods. However, there may be other requirements depending on the situation, such as the need to estimate emissions using another approach for an emission exceedance.
- The initial compliance demonstration for CEMS is the 30-day test, which has details prescribed in the rule and in the methods.
- For CPMS, the initial compliance starts with establishing the operating limit during testing, with subsequent operations being monitored against the established operating limit.
- The details of the monitors, operations of each, performance evaluations, quality assurance (QA)/quality control programs, and other details are all compiled in a new plan, i.e., the Site-Specific Emissions Monitoring Plan.
- The data acquisition system (DAS) must be programmed to collect and compute all the data for documenting compliance and for regulatory reporting. It is recommended that the DAS mapping and programming be carefully documented to show how all the compliance calculations, conversions, etc., are handled in the system.

The investment in planning, design, testing, and certification of the new CMS is incrementally more significant for cement plant operators under this rule. Continued testing and technical support for the final stages of implementation for the instrumentation part of the upgraded PC MACT rule is one of the critical components of the regulatory program for all cement plant operators.

3) *Upgraded Stack Testing Regime*: At first glance, the 2015 PC MACT rule promised to have streamlined stack testing requirements due to the increased reliance on CEMS. Interestingly, there is the potential for considerably increased testing for certain facilities and certain situations, such as with changes to the facility that could impact emissions. As several large industries are subject to additional similar testing requirements, it may be more of a challenge to find available testing firms, thus booking ahead will be important. Fortunately, with multiple combustion industries operating under similar rules, the learning curve will also ramp up and allow more knowledge transfer in the future.

The upgraded rule requires an initial stack test, and there are continuing test requirements. The combination of possible performance test requirements includes the following:

- 1) initial performance test for PM, THC OHAPs (if the alternative is used), and HCl, depending on which option the

facility is following [dioxin/furan (D/F) testing can also be combined, depending on the timing for the ongoing testing cycle];

- 2) annual stack test for PM to correlate to a CPMS limit;
- 3) non-CEMS pollutants to be tested every 30 months;
- 4) correlating stack test for separate stack configurations;
- 5) additional testing triggered if an operating limit is exceeded:
  - PM: test within 30 days;
  - THC (if used to indicate OHAPs): test with 90 days;
  - SO<sub>2</sub> (if used to indicate HCl): test within 60/90 days;
- 6) additional testing if the facility implements a change, as described in 40 CFR 1348(c), that can increase emissions.

For each round of testing, there are related notifications, preparation of a test plan, and the requirements for the test report and Notification of Compliance. All of the test data will need to be submitted in EPA's online system.

Overall, testing challenges include planning the test schedule and booking ahead for test companies, more detailed plant involvement and QA on test plans, operations during testing, and implementing the results of the test through the established operating parameters.

4) *Operating Plans, Recordkeeping, and Reporting:* The MACT rule-required plans are all impacted by the upgraded rule requirements, thus updating, adding, and deleting past plans. The following plans are required.

- 1) Operations and Maintenance (O&M) Plan: This plan addresses operations of the subject equipment and the pollution control device(s); operations during startup and shutdown periods; corrective actions for malfunctions and deviations; procedures for combustion system annual inspections and other inspections; and recordkeeping and reporting requirements. The PC MACT rule upgrades to the O&M plan will need to be in place at the facility by the compliance date, although the plan does not necessarily need to be submitted to the agency for review and approval until the next review/reissuance of the facility's Title V application. The updated plans will need to incorporate the 2015 PC MACT rule's many updates, including incorporating the startup/shutdown requirements in the new fashion and incorporating affirmative defense approaches to malfunctions (although the affirmative defense provisions in the rule have been removed, environmental managers are still encouraged to continue to document the details of the situation in accordance with general affirmative defense procedures).
- 2) Site-Specific Emissions Monitoring Plan: This plan addresses CMS (including CEMS, CPMS, and COMS). The plan must address setup (location, equipment and instrumentation specifications, performance evaluations, and calibrations) and ongoing operations (monitoring equipment and instrumentation O&M, quality assurance, recordkeeping, and reporting). The plan is to be submitted at least 30 days before the initial CMS evaluation, if requested by the agency.
- 3) Recordkeeping and Reporting: Records will still need to be maintained for five years, for the MACT documentation, with two years of data required to be maintained on

site. The amount of records and data will be increased substantially under the upgraded regulatory regime. Some of the types of data under the upgraded rule include the following:

- instrumentation recordings for all of the CMS;
- daily clinker production and kiln feed;
- date/time/duration of each startup/shutdown;
- date/time/duration of each malfunction and actions taken (both equipment/air pollution control device (APCD) malfunctions and instrumentation malfunctions); and
- date/duration of other exceedances and actions taken.

## B. CISWI Considerations

1) *Implementing Emission Standards:* CISWI facilities have some time to complete the analysis and resolution of any kiln system emission parameters since the final compliance date for existing facilities is not until early 2018. However, careful tracking of any facility changes or state program changes is critical, as these could impact the site-specific timeline.

- 1) Existing facility kiln system considerations for CEMS- and non-CEMS-monitored pollutants include differences between CISWI and PC MACT, in that CISWI addresses CO, NO<sub>x</sub>, SO<sub>2</sub>, and semivolatile metals lead and cadmium (in addition to PM, Hg, D/F, and HCl) but not THC (which is addressed by the PC MACT rule).
  - The pollutants Hg and HCl (if no scrubber is used) are intended to be CEMS monitored, in the same manner as PC MACT.
  - For PM and the SO<sub>2</sub> CEMS monitoring method for HCl, site-specific operating limits will be established during the stack emission compliance testing that is the same as PC MACT.
  - For CO, SO<sub>2</sub>, NO<sub>x</sub>, lead, and cadmium, the rule also provides compliance options for instrumentation and/or methods to demonstrate compliance.
- 2) Establishing operating limits that correlate to the stack test demonstrating compliance is similar to the approach in the PC MACT rule.
- 3) If a facility performs a modification, construction, or reconstruction, the source becomes a new source with lower limits. The PM new kiln limit is under litigation, and the industry hopes to impact the final limit to allow it to be achievable.
- 4) Certain states have earlier dates for submittal of an early compliance item, i.e., the Final Control Plan. The plan is intended to document the facility's future approach to control each pollutant within the CISWI limits and the steps that will be used to bring the facility into compliance as soon as practical (but not later than February 7, 2018.) The CISWI rules also require the Waste Management Plan to be submitted with the Final Control Plan. Hence, despite the longer time frame for implementing the CISWI requirements, there are potential early submittals that require preplanning.

- 5) The CISWI rules are also applicable at all times, with startup and shutdown operations and periods of malfunction subject to the same emission standards as normal operations (as opposed to the workplace standards in PC MACT for startup and shutdowns). During a startup or shutdown, the oxygen correction is not required to be incorporated into data calculations; hence, startup and shutdown data are tracked and averaged separately. The cement industry is still discussing with EPA the possibility of achieving a consistent approach to startup and shutdown in CISWI as PC MACT.
- 6) The CISWI rules are based on the NSPS Subpart 60 requirements, with Subpart A of Part 60 applying as opposed to Subpart A of Part 63 that applies to PC MACT kilns.

2) *Instrumentation Upgrades/Additions and Instrument Performance Evaluations:* The CISWI requirements are similar to PC MACT for the instrumentation and therefore have similar planning considerations, as discussed in the PC MACT discussion earlier. The new CISWI regulations mandate a number of new emission monitors, each with its own specific requirements. CISWI also requires the development and use of an Emissions Monitoring Plan to document instrumentation procedures and information, similar to the PC MACT Emissions Monitoring Plan requirement.

3) *CISWI Stack Testing Regime:* The timing of this regulation creates the opportunity for CISWI facilities to take advantage of lessons learned as the PC MACT facilities bring the new instrumentation and equipment into the full suite of compliance. However, because EPA is rolling out these more demanding emission monitoring requirements across numerous industries and MACT rules, the quest to have operational readiness for compliance with the new rule ahead of the curve will still be important. As with PC MACT facilities, the testing challenges include the need for more detailed plant involvement and QA on test plans and test results. In addition to establishing operating limits for continuous compliance during stack testing, the issue of using representative waste during testing is part of the CISWI regime.

As with PC MACT, the testing frequency will increase with the CISWI rule compliance regime. The rule requires annual stack testing for non-CEMS-monitored pollutants but has the opportunity to reduce the frequency to every three years once a pattern of low emissions are established. The necessity to redo testing also exists for changes in waste type, in addition to if there is an exceedance of the operating limits.

4) *Operating Plans, Recordkeeping, and Reporting:* As with PC MACT, CISWI has the full suite of operating plans and recordkeeping and reporting requirements. A key requirement for the more classic incinerator rule is the operator training requirements. The kiln system will need to be run by trained/qualified operators per operator training plan implemented by the facility. The operator training requirements in the rule spell out the training topics, which address operations of the kiln system and controls to managing the waste fuels. There is also a long list of records that needs to be part of the training and kept for ongoing operations of the facility, including O&M

plans for the kiln and APCDs, procedures for managing the waste fuel, SSM procedures, and more.

### C. NHSM Implementation Readiness Check

Since the original publication of the new RCRA rule for non-hazardous waste, the cement industry has worked diligently to better understand the detailed steps of the solid waste “test” in the regulation and the best approach to perform the evaluation steps. Due to its self-implementing nature, it is particularly important to have confidence in a facility’s analysis and decisions, such that a future inspector will understand and agree with the approach that is used and documented by the facility.

Why is the NHSM documentation so critical? Recall that the CISWI definition states a cement facility is by definition a CISWI source if solid waste fuel is or has been used within the previous six months or if the facility does not keep documentation addressing the NHSM processing and legitimacy criteria. Hence, as long as alternative fuels are documented to not be solid waste, in accordance with the 40 CFR 241 NHSM rules, and they meet other facility permitting and operating requirements, then the fuel can be handled just as it currently is (pre-NHSM and CISWI), while maintaining the NHSM documentation demonstrating why the kiln system remains subject to the PC MACT rules.

The two-part test to demonstrate whether a material is, or is not, a solid waste includes the following:

- 1) sufficient processing to render the waste into a new fuel;
- 2) meeting the legitimacy criteria, which includes addressing:
  - handling as a commodity;
  - contributing energy value to the process; and
  - having comparable constituent concentrations to traditional fuels.

The learning curve on the NHSM rule has been based on several years of facilities requesting clarifications from EPA in addition to the preambles of the original rule proposal, the 2011 original rules, and the 2013 final rules. EPA has issued 25 clarification letters as of December 2014. Additionally, EPA has proposed additional exclusions from the rule in April 2014, with the final rule pending. Facilities wanting to stay out of CISWI and maintain compliance with PC MACT will be necessitated to use best judgment in documenting their material and will continue to need to monitor updated rules and clarifications from EPA for even more regulatory certainty in the future. EPA contemplated in the rule development that it may take time for clarity on this issue. For facilities that accept a wide variety of alternative fuels, one option is always to comply with the CISWI rules instead, thus rendering the “is it solid waste” question as irrelevant. As additional clarity unfolds, CISWI facilities can further determine if switching back to PC MACT is possible for their specific situation or if complying with CISWI for the kiln system is the best long-term option.

#### IV. CONCLUSION

The upgraded PC MACT and new CISWI and NHSM regulations pose a significant challenge to the cement industry for 2015 implementation actions. Each cement kiln manufacturing facility is already grappling with a number of important decisions and actions. First and foremost is the need for a final confirmation, which the regulation will apply to the kiln system(s) at the facility, i.e., PC MACT or CISWI, which have different compliance schedules and requirements. For the remainder of the facility sources regulated under PC MACT at all facilities, meeting the 2015 PC MACT deadline for upgrades will require continued effort to finalize the new implementation regime. Installing and testing the newly required equipment and instrumentation, in addition to implementing the updated operating plans, recordkeeping, and reporting systems, will take significant time and resources.

Planning is the key to effective implementation of all the components of the upgraded compliance program. With a strong plan and a realistic schedule, the cement industry will (yet again) achieve compliance with a new level of complex environmental regulations. In addition, a final readiness check will assist facilities in confirming that the details are in place for a full implementation program by the upcoming regulatory compliance dates.

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