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January 17, 2012

VIA ELECTRONIC MAIL AND U.S. MAIL

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Dr. Donald R. van der Vaart
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RE: *Review of Hearing Officer's Report and Recommendations and Public Comments*
Draft Air Quality Permit No. 07300R08 (Draft Permit)
Facility ID: 6500296
Carolinacement LLC
Castle Hayne, New Hanover County, North Carolina

Dear Director Holman and Dr. van der Vaart:

By this letter, Carolinas Cement Company LLC (CCC) respectfully offers discussion and clarification for consideration by the Department of Environment and Natural Resources, Division of Air Quality (DAQ) related to your review of the Hearing Officer's Report and Recommendations dated December 20, 2011 (Hearing Officer's Report) and public comments received by DAQ during the public comment period, which ended on October 31, 2011. Please consider this discussion and clarification with your final consideration of the Draft Air Permit and the Preliminary Determination. This letter does not provide any new information outside the permitting record. With the addition of this review, CCC hopes that you have sufficient information to issue the final air quality permit.

I. Background

As you know, the proposed air quality permit is an important part of CCC's development of a Portland cement manufacturing facility in Castle Hayne, North Carolina. This project would represent a \$500 million investment in the Castle Hayne community that is projected to provide over 1,000 temporary construction jobs and over 160 permanent full time jobs once the facility begins operation. Regional economic development agencies also estimate that the project will produce 300 to 400 indirect jobs and yield an additional \$180 million in new regional commerce annually. Further, Portland cement is an essential building material that will be used in scores of building applications around the region. The proposed plant will use state of the art technology to supply building materials needed for schools, roads, bridges, libraries, hospitals, universities, military installations, and government buildings throughout North Carolina and the Mid-Atlantic region.

The Draft Permit and the Preliminary Determination reflect the extensive work by DAQ staff over the past four years, gathering and analyzing information and data from a wide range of sources, including the United States Environmental Protection Agency (EPA), other State and federal agencies, members of the public, and CCC. In particular, the Draft Permit and Preliminary Determination reflect the considerable work performed by DAQ staff since the initial Draft Permit was issued for public comment in September, 2009. The Draft Permit and Preliminary Determination published in August, 2011 include significant changes and improvements to the 2009 draft that address the issues raised and comments made by EPA, community groups and members of the public. For example, compared to the 2009 draft permit, kiln emissions would be 93% lower for Particulate Matter, 70% lower for SO₂, 23% lower for NO_x, and 82% lower for mercury.

Moreover, this permit incorporates the new, stringent emission control standards adopted by EPA for Portland cement manufacturing facilities last year. Under the Draft Permit, "best available" and "maximum achievable" control technologies are required to be installed and operated in the facility, and modeling assures that CCC's emissions will not impact in any way New Hanover County's attainment status for National Ambient Air Quality Standards (NAAQS). The Draft Permit requires compliance with the new stringent EPA emissions standards, and CCC plans to construct a cement plant with unequalled pollution controls. The Draft Permit complies with all applicable State and federal requirements and is protective of human health and the environment. As such, DAQ should issue the final permit.

II. Factual Clarification Regarding the Proposed Quarry

While it would not be productive to attempt to correct all of the factual misstatements and misrepresentations made to the Hearing Officer by commenters at the public hearing and in writing, it will be helpful to DAQ and the public to clarify important facts related to the proposed quarry. Certain public comments falsely stated that CCC had "withdrawn" or "abandoned" its plan for the proposed limestone and marl quarry that are planned to be the source of raw materials for cement production. CCC has neither withdrawn nor abandoned its proposed quarry plan relative to the air

permit. Based on the misstatement that CCC has failed to define a proposed quarry area, public commenters have further alleged that the air permit application is incomplete, that proper air modeling was not conducted, and that emissions cannot be predicted, among other allegations. DAQ should dismiss all of these public comments because they are based on the false premise that CCC has failed to provide sufficient information regarding its proposed quarry.

It should first be noted that a substantial amount of the proposed quarry area has been mined for decades and is currently an active quarry operation. CCC has submitted to DAQ information regarding initial boundaries of the proposed project, including the quarry, and such information is more than sufficient for issuance of a final air permit. In 2008, at the time of the initial permit application, CCC submitted proposed project boundary information to DAQ including proposed quarry areas. See Sheet 2 of Plot Plan and Survey Maps (posted to DAQ website April 8, 2008). This proposed quarry area was limited to property owned by CCC or legally controlled by CCC. Later in 2008, in an effort to limit environmental impacts, the proposed quarry area was reduced in size to avoid disturbance of CAMA wetlands areas. However, the project boundaries for compliance purposes remain unchanged. CCC also submitted information regarding the chemical and mineralogical characteristics of the site specific raw materials representative of the proposed quarry area. CCC only seeks an air permit based on the quarry area proposed in 2008.

Public commenters attempt to confuse the Hearing Officer and DAQ by referencing CCC's quarry submissions to the U.S. Army Corps of Engineers (USACE) related to CCC's application for a Clean Water Act Section 404 permit. Some of CCC's submissions to USACE have depicted a larger proposed quarry area than the area submitted to DAQ for air quality permitting purposes. The quarry submissions to USACE for Section 404 permitting purposes are not applicable to the air permitting analysis and are not in any way an indication that CCC has "withdrawn" or "abandoned" its proposed quarry as related to the air quality permit. CCC understands that, should it wish to use raw materials located in other potential quarry areas, it will be necessary to apply for a permit modification, and CCC may be required to evaluate the raw materials from those areas to ensure there is no significant change in material composition that could affect emissions. Furthermore, it is understood that the evaluation and modeling of particulate emissions from any new quarry areas may also be required to ensure compliance with applicable particulate matter standards.

In summary, CCC has not withdrawn or abandoned its 2008 quarry plan for purposes of the air permit, assertions that CCC has not defined the quarry area or evaluated the raw materials are incorrect, and all comments based on such false premise must be dismissed without further consideration. The Hearing Officer has suggested that DAQ expressly state in the final permit that a permit modification would be required if CCC later chooses to use raw materials from a quarry other than the quarry area proposed in the air permit application. CCC agrees in principle to a permit condition along those lines.

III. Discussion of Hearing Officer's Recommendations and Related Public Comments

In an effort to provide DAQ with sufficient information to complete its review and issue a final air permit, CCC offers clarification and explanation related to the recommendations in the Hearing Officer's Report and public comments submitted on the same topical areas. Beyond the discussion

provided below, CCC reserves the right to provide additional discussion related to the Hearing Officer's Report as such information may be developed. Each of the recommendations from the Hearing Officer's Report is set forth below with discussion for consideration by DAQ:

1. *I recommend that the DAQ in conjunction with legal counsel evaluate whether proceeding with the air permitting process prior to completion of an environmental review under NEPA is valid.*

The Hearing Officer's first recommendation appears to be based on the comments of several commenters speciously suggesting that the federal National Environmental Policy Act (NEPA), 42 U.S.C. §§ 4321 – 4345, would prevent issuance of a final air quality permit in this case. This assertion is incorrect. First, NEPA does not apply to the issuance of air quality permits by state agencies, and permitting pursuant to the federal Clean Air Act is statutorily excluded from NEPA jurisdiction. Second, air quality permitting pursuant to the Clean Air Act involves such a thorough and comprehensive review and requires compliance with such strict and highly technical EPA-mandated standards that courts have ruled that the Clean Air Act approval process is equivalent to a NEPA review, such that a NEPA inquiry is not required. Third, the public comments received on this issue primarily deal with the scope of NEPA review related to CCC's application for a Section 404 permit, rather than the air permit. Fourth, the NEPA inquiry associated with the Section 404 permit application will not be prejudiced by the issuance of the air final permit.

First and foremost, DAQ's action on the air permit for the CCC facility does not have to await NEPA review because Congress has expressly exempted actions under the Clean Air Act from NEPA jurisdiction. CCC's air permit application is for a PSD permit pursuant to the Clean Air Act. Congress made it crystal clear that “[n]o action taken under the Clean Air Act [42 U.S.C. 7401 et seq.] shall be deemed a major Federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act of 1969 [42 U.S.C. 4321 et seq.].” 15 U.S.C. § 793(c)(1). This express statutory exemption has been recognized by federal courts as well. *See Nance v. EPA*, 645 F.2d 701, 712 (9th Cir. 1981) (“Actions under the Clean Air Act...are expressly exempted from the requirement of the preparation of an EIS”). CCC has not found any exception to this clear congressional categorical exclusion for air permitting, and no public commenter has cited any case where a NEPA inquiry was required on top of an environmental permit that was statutorily exempt from NEPA. The CCC facility air permitting process is statutorily exempt from NEPA jurisdiction and any NEPA related document preparation requirements. Moreover, any delay of the air permitting process based on a requirement for NEPA review – whether or not so labeled – would violate federal law and the clearly stated intent of Congress that actions under the Clean Air Act are exempt from NEPA review.

Second, even if there were not a clear statutory exemption from NEPA review, no NEPA review is necessary because the comprehensive and extensive air permitting process under the Clean Air Act is the equivalent of NEPA review. The doctrine of “functional equivalency” applies to virtually all government actions pursuant to the Clean Air Act, including the air permitting process, and a NEPA inquiry is not required. From the early years of NEPA, federal courts have recognized that there is “little need in requiring a NEPA statement from an agency whose *raison d’être* is the protection of the environment and whose decision . . . is necessarily infused with the environmental

considerations so pertinent to Congress in designing the statutory framework.” *International Harvester Co. v. Ruckelshaus*, 478 F.2d 615, 650 n.130 (D.C. Cir. 1973). Federal courts have long held that the Clean Air Act is so rigorous in its protection of the environment that any additional NEPA inquiry would be duplicative and unnecessary. *See Getty Oil Co. v. Ruckelshaus*, 467 F.2d 349, 359 (3d Cir. 1972) (“It is apparent that the Clean Air Act itself contains sufficient provisions for the achievement of those goals sought to be attained by NEPA”). Simply put, the thousands of pages of federal air quality regulations are considered sufficient to achieve the required level of environmental protection. Here, the entire air permitting process is one based on environmental considerations, and the agency responsible for the permitting process, DENR, is principally charged with protecting the environmental quality in North Carolina. Accordingly, no NEPA review would be appropriate even if the statutory exemption of 15 U.S.C. § 793(c)(1) were not in place.

Third, the public comments regarding NEPA issues prematurely focus on the scope of the NEPA analysis undertaken during the Section 404 permitting process. CCC readily agrees that the proposed quarry will require a Section 404 permit and the completion of an environmental impact statement pursuant to NEPA through coordination of the USACE. Certain public comments make lengthy allegations that the cement plant operations and the quarry must be reviewed together in one NEPA review. Any questions as to the proper scope of the NEPA review are questions for the USACE, not DAQ. Thus questions of “connected actions” or “independent utility” are questions for the USACE in the Section 404 permitting process and may be resolved in that process. Such questions are not relevant to the air quality permit.

Fourth, while certain public commenters allege that issuance of a final air permit would illegally limit the potential alternatives to be evaluated in the NEPA review associated with the Section 404 permit, they overstate the legal effect of issuance of a final air permit. As a preliminary matter, it must be noted that a NEPA analysis does not require review of every option imaginable, only those alternatives that are reasonable given the needs to which the project proposal is addressed. *See Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council*, 435 U.S. 519, 551 (1978). The U.S. Supreme Court has recognized that common sense dictates that the range of alternatives “cannot be found wanting simply because the agency failed to include every alternative device and thought conceivable by the mind of man. Time and resources are simply too limited to hold that an impact statement fails because the agency failed to ferret out every possible alternative.” *Id.* DAQ’s issuance of a final air permit in this case would not impermissibly limit the choice of reasonable alternatives for the Section 404 analysis. The final air permit would not allow CCC to impact wetlands or surface waters in any way. Such proposed impacts and potential alternatives to such impacts are within the jurisdiction of the USACE and the Division of Water Quality. The USACE will undertake a robust alternatives analysis (including a no-action alternative), regardless of the results of the air permit, and the mere fact that an air permit has been issued will not prejudice the USACE’s analysis of the Section 404 permit application.

- I recommend that the DAQ investigate and provide formal clarification regarding the effect of a change in the zoning ordinances prior to permit issuance and the subsequent effect this has on the permitting process.*

The zoning consistency determination submitted with the permit application in 2008 is valid and the air permit application is complete. The Hearing Officer apparently made this recommendation based on various public comments incorrectly alleging that CCC's air permit application requires a new zoning consistency determination because New Hanover County made certain amendments to its zoning ordinance since 2008. These commenters contend that the prior zoning consistency determination is invalid or nullified by an ordinance amendment adopted by New Hanover County on October 3, 2011 that requires a special use permit for certain uses in the Heavy Industrial zoning district. Such commenters suggest DAQ should not act on CCC's application or return CCC's application as incomplete. However, these comments misconstrue the legal requirements for a zoning consistency determination, misrepresent the zoning consistency requirements of the air permitting process, and misunderstand the new operation of the zoning ordinance amendment.

It is important at the outset clearly to state the zoning consistency requirements for air permitting established by N.C. Gen. Stat. § 143-215.108(f). As set forth in the statute and as described in the DAQ Memorandum: *Zoning Consistency Determination* (July 31, 2000) (DAQ Zoning Memorandum), a permit applicant must include in its application a written request to the local zoning authority for a zoning consistency determination. The local zoning authority may determine that a proposed facility is consistent or inconsistent with the local zoning or subdivision ordinance. DAQ then proceeds with the permitting process regardless of the local jurisdiction's determination on the zoning consistency issue. As noted in the DAQ Zoning Memorandum, "even if the local government has zoning ordinances in effect that would prohibit the source from constructing or operating, [DAQ] may still issue the air quality permit. In those instances the statute simply requires that a condition be placed in the permit stating that prior to construction or operation of the facility the permittee will comply with all lawfully adopted ordinances." See DAQ Zoning Memorandum at 1-2. For issuance of the air permit, there is no requirement that the proposed facility be consistent with local zoning. However, if the project is inconsistent, then a special zoning condition must be included in the final permit.

In this case, in February 2008, CCC submitted to DAQ its written request to New Hanover County for a zoning consistency determination. Subsequently on March 27, 2008, DAQ received the signed zoning consistency determination from New Hanover County. Thus, CCC fully complied with all of the zoning consistency requirements of N.C. Gen. Stat. § 143-215.108(f).

The recent amendments to the New Hanover County zoning ordinance adopted on October 3, 2011 (2011 Amendment) do not change this result. First, the proposed facility remains consistent with the applicable zoning for the subject property. The 2011 Amendment did not alter the zoning of the site for CCC's proposed facility, and it does not prohibit the use proposed by CCC. Rather, the 2011 Amendment simply requires an additional approval process (a special use permit) for certain uses in the Heavy Industrial zoning district. Whereas prior to October 3, 2011, only a building permit was required prior to construction of CCC's proposed facility, the 2011 Amendment purports to require a special use permit as well. The proposed facility is still permissible on the proposed site as currently zoned, but potentially may require a special use permit. As a result, New Hanover County's 2008 zoning consistency determination is still correct and valid. Second, even if New Hanover County had originally determined (or should subsequently determine) that CCC's proposed project is not consistent with the zoning ordinance, DAQ would proceed with permitting

based on established DAQ policy. The proper remedy simply would be the inclusion of a permit condition regarding zoning compliance as described above. Third, there are substantial questions regarding the legal validity of the 2011 Amendment and any possible application of the 2011 Amendment to the CCC project. In summary, CCC has complied with all requirements of N.C. Gen. Stat. § 143-215.108(f), the 2011 Amendment did not alter the zoning or permissible use of CCC's property although a special use permit may be required, and even if local zoning prohibited the use of CCC's property for a cement plant or quarry, DAQ policy requires that DAQ still process the permit application and include in the final permit a proper permit condition regarding zoning compliance. This issue is resolved, and no further review is required.

3. *I recommend that the DAQ review [Executive Order 15] to determine the applicability to this situation and verify that the DAQ has fulfilled any applicable requirements of [Executive Order 15].*

Based on public comments alleging that a 34-year old executive order prohibits the issuance of a final air permit to CCC, the Hearing Officer made this recommendation to DAQ and suggested that DAQ evaluate any applicability to the CCC permit application. Certain public comments suggest that Executive Order 15, issued by Governor Hunt in 1977, imposes additional specific and independent permitting requirements on the proposed CCC air permit – and, by extension, on all State permits in the twenty county coastal zone. The commenters have simply misinterpreted the scope and meaning of Executive Order 15 and have grossly overstated its applicability.

Executive Order 15, to the extent still valid, is a very general policy statement regarding implementation of the Coastal Area Management Act of 1974 (CAMA) and instructs state agencies to take into account coastal policies in the development of regulatory programs. Executive Order 15 was issued in 1977 so it could be considered in 1978 as part of North Carolina's overall coastal management program submitted for federal approval pursuant to the federal Coastal Zone Management Act. Since that time, the state has established hundreds of pages of CAMA rules, regulations, and policies, all twenty coastal counties and over seventy coastal towns have adopted local CAMA land use plans, and the state has developed and implemented a comprehensive CAMA permitting process that involves extensive multi-agency review and coordination. This multi-agency review of CAMA major development permits successfully implements the coordination envisioned by Executive Order 15. The General Assembly, the Coastal Resources Commission, and DENR, through CAMA and related administrative regulations, have specified those development activities and permits that require the type of multi-agency review described in Executive Order 15. As noted above, the order itself is a general policy statement; it does not impose additional independent permitting requirements on specific permit applications and does not create new independent additional permitting criteria to the CCC permit application.¹

¹ DAQ and DENR should note that, if Executive Order 15 were interpreted to impose new additional permitting requirements, this would apply to all State permits issued in the twenty coastal counties. Air permits, Section 401 water quality certifications, stormwater permits, sedimentation and erosion control permits, mining permits, etc. would all be subject to any new permitting requirements created by such an interpretation. For context, there are over 40 air quality permit applications currently pending for facilities in the twenty coastal counties and a vast number of applications for other permits. Imposing new permitting requirements on all state permits in the coastal zone, and potentially reopening thousands of existing permits, would be extremely disruptive to communities in the coastal zone and extraordinarily burdensome to DENR. Additionally, we are not aware of any other air permits in coastal counties for which

Similarly, contrary to suggestions of certain commenters, the New Hanover County CAMA land use plan does not impose additional independent legal requirements on CCC's air permit application. DAQ and DENR have long recognized that it is not their job to enforce local land use regulations. New Hanover County's zoning ordinance contains specific requirements that any project, including CCC's proposed facility, must meet before it is constructed. The general statements and comments in the New Hanover County CAMA land use plan cherry-picked by commenters are not regulatory in nature, and the plan itself clearly states that it is not legally "binding in the sense of an ordinance." See Wilmington – New Hanover County Joint Coastal Area Management Plan 2006 Update at 2.

Additionally, it should be noted that the objection of the commenters regarding compliance with coastal management policies and regulations is premature. The proposed Portland cement facility will require not only an air quality permit, but many other permits and approvals as well. As CCC applies for such additional permits and approvals, it will assure compliance with any and all legal requirements, as may be applicable, associated with CAMA permits, wetlands permits, coastal stormwater permits, sedimentation and erosion control permits, and the New Hanover CAMA land use plan. By obtaining other required permits for the Portland cement facility, CCC will assure compliance with all applicable legal requirements of the North Carolina coastal management program.

4. *I recommend the DAQ notify the appropriate agencies within NCDENR overseeing the alleged chromium spill and leaking underground storage tank to ensure that these issues are being addressed.*

Regarding this recommendation of the Hearing Officer, such issues of alleged contamination are within the purview of the Division of Waste Management and are not relevant to the air permitting issues associated with this project.

5. *I recommend that the DAQ review both the BACT and the MACT analysis and the issues listed in this report be addressed and/or clarified in the air permit and air permit review.*

Please see the discussion of this recommendation and public comments regarding these issues in Attachment A, which is incorporated herein by reference.

6. *I recommend that DAQ review the methodology used to demonstrate compliance with the modeled pollutants and that each of the comments with respect to air dispersion modeling be addressed and clarification be provided in air permit review as well.*

Please see the discussion of this recommendation and public comments regarding air modeling issues in Attachment B, which is incorporated herein by reference.

7. *I recommend that the DAQ continue to review the issue of environmental justice with respect to this project and ensure that environmental justice is maintained.*

This recommendation by the Hearing Officer appears to be based on certain public comments alleging that issuance of a final air permit could result in disproportionate impacts on minority and low-income populations. Even assuming the accuracy of the commenters' demographic information, no further action is required by DAQ or CCC related to this issue or the Hearing Officer's recommendation. First, a final permit for the CCC facility will require full compliance with National Emission Standards for Hazardous Air Pollutants from the Portland Cement Manufacturing Industry, 40 C.F.R. Part 63, Subpart LLL and the New Source Performance Standards for Portland Cement Plants, 40 C.F.R. Part 60, Subpart F. Pursuant to federal Executive Order 12898, EPA evaluated environmental justice issues associated with Portland cement air emissions standards and found that there will not be "disproportionately high and adverse human health effects on minority or low-income populations because [such standards] increase[] the level of environmental protection for all affected populations without having any disproportionately high and adverse human health or environmental effects on any population." See 75 Fed. Reg. 54970, 55033 (Sept. 9, 2010). Thus, based on EPA's own detailed evaluation of environmental justice issues related to Portland cement plant emissions overall, CCC's compliance with the EPA mandated air emissions regulations resolves any possible environmental justice concerns.

Second, as related to PSD permitting specifically, EPA has acknowledged repeatedly that permittee compliance with National Ambient Air Quality Standards (NAAQS) demonstrates a level of public health protection such that there would be no disproportionate impact on minority or low-income populations. See, e.g., In re Shell Offshore, Inc., 13 E.A.D. 357, 404-405 (EAB 2007). Because the NAAQS are health-based standards, they are designed to protect children, the elderly, and sensitive populations. NAAQS standards are based on extensive scientific evidence and are subject to a high level of critical review by EPA, scientific advisory bodies, and the public. Compliance with the NAAQS means that no adverse health impacts would be expected, thus no disproportionate impacts would be expected to any group, whether minority, low-income, or otherwise. Regarding CCC's air permit application, the extensive air quality modeling and predictive calculations submitted to DAQ show that CCC's proposed facility will comply with NAAQS and applicable PSD increments. Additionally, CCC's modeling shows that the facility will not cause or contribute to any NAAQS violation. As a result, there are no further environmental justice issues to consider.

Third, CCC is not aware of any independent state legal requirement for review of environmental justice issues associated with the processing of an air quality permit application. Similarly, no public commenter has cited to any such state legal requirement. DAQ's PSD permitting guidance document, *North Carolina PSD Modeling Guidance* (April 1, 2011), does not mention environmental justice issues. Because this matter does not raise any environmental justice concerns, DAQ should consider this issue resolved.

8. *I recommend that the air permit explicitly specify that a permit modification application is required if CCC chooses to utilize limestone from a different quarry other than what the application is based upon.*

As discussed in Part II of this letter, CCC has not withdrawn or abandoned its 2008 quarry plan for purposes of the air permit. The Hearing Officer has suggested that a final permit contain language to clarify that a permit modification would be required if CCC later chooses to use raw materials from a quarry other than the quarry area proposed in the air permit application. CCC agrees in principle to a permit condition along those lines.

9. *I recommend that the DAQ review and address comments made by the applicant with respect to the air permit and associated permit review.*

CCC agrees with this recommendation of the Hearing Officer.

IV. Additional Discussion of Issues Raised in Public Comments

Several additional public comments were submitted to DAQ raising concerns that were not the subject of the Hearing Officer's recommendations. While CCC has addressed some of these points in prior submittals, the additional discussion below may be helpful the public and to DAQ as it makes its final review prior to issuance of the air permit.

A. Emissions from the CCC Plant will not Impact Attainment Status for SO₂

During the public hearing and in written comments, certain commenters suggested that SO₂ emissions from the CCC plant may affect the NAAQS attainment status for all or part of New Hanover County. Such comments reflect a misunderstanding of the New Hanover County SO₂ attainment issue as it relates to new sources of SO₂ emissions. The county's attainment status is based on emissions from existing sources. Under State and federal air permitting regulations, any new source must demonstrate that its SO₂ emissions will not cause or contribute to a violation of the 1-hr SO₂ standard. CCC has done that in this case. CCC has demonstrated, using conservative models and protocols approved by DAQ and EPA, that SO₂ emissions from the proposed plant will not cause or contribute to any exceedance of the 1-hr SO₂ standard in New Hanover County. Compliance with this requirement is discussed in detail in the Preliminary Determination prepared by DAQ. Furthermore, the Draft Permit addresses compliance by mandating a maximum 1-hr SO₂ emission rate and monitoring of SO₂ emissions with a continuous emission monitor. Additionally, if EPA designates New Hanover County, or portions thereof, to be non-attainment for 1-hr SO₂ due to existing sources, CCC's emissions will not hinder the county from achieving attainment status in the future as it addresses those existing sources. Simply put, New Hanover County's attainment status regarding the 1-hr SO₂ NAAQS is and would not be affected in any way by CCC's proposed SO₂ emissions. Despite this fact, some public commenters continue to allege that SO₂ emissions remain an open issue regarding the air permit. CCC concurs with DAQ and the Hearing Officer that this issue is resolved and closed.

B. Mercury

Throughout the CCC air permitting process, significant emphasis has been placed on mercury emissions issues. Opponents of the CCC project have focused on potential mercury emissions from

the CCC plant, and CCC has devoted substantial resources and attention to this issue to address concerns articulated by members of the public.

1. Compliance with NESHAP MACT for Mercury

Some public commenters have questioned whether the mercury emissions control technology required by the Draft Permit represents the “maximum achievable” controls. In 2010, EPA established stringent new standards for mercury emissions in revisions to air quality rules known as the National Emission Standards for Hazardous Air Pollutants from the Portland Cement Manufacturing Industry, 40 C.F.R. Part 63, Subpart LLL. In such rules, EPA determined the “maximum degree of reduction that is achievable” for mercury emissions, which is equal to the best controlled source in the United States. The Draft Permit requires CCC to meet this new federally mandated mercury emission limit and to install and operate a carbon injection system to control mercury emissions. In addition, the operation of a wet scrubber, required primarily to control SO₂ emissions, will also reduce mercury. The mercury emissions limit in the Draft Permit and this specified control technology will meet the stringent mercury emissions standards determined by EPA to be the “maximum achievable.” As a result, under the Draft Permit, mercury emissions will be 82% lower than the limit included in the 2009 draft permit for CCC. This meets all State and federal legal requirements.

2. Mercury Emissions

Many public commenters expressed concern regarding potential mercury emissions from the CCC plant. During DAQ’s review of the first draft permit, CCC submitted additional information regarding potential mercury emissions. Despite the fact that there is no legal requirement to conduct a risk assessment associated with PSD permitting, CCC commissioned a thorough *Human Health Risk Assessment of Mercury Emissions from the Proposed Carolinas Cement Facility, Castle Hayne, North Carolina* (Intertox, March 30, 2009) (Risk Assessment). This was done voluntarily and outside the scope of the permit application in an effort to provide sound scientific information to the public regarding potential impacts from mercury emissions. We understand that DAQ has obtained a copy of the Risk Assessment, as the document was made available to the public by CCC.

The Risk Assessment evaluated potential impacts to mercury levels in fish based on a study by Entrix. See Risk Assessment Appendix E, *Entrix Memorandum* (March 10, 2009). Additionally, the Risk Assessment took into account a *Mercury Modeling and Deposition Analysis* (February 26, 2009), prepared by Environmental Quality Management, Inc. (EQM). See *Risk Assessment*, Appendix B. The Risk Assessment makes clear that estimated mercury emissions, even using higher mercury emissions limits from the 2009 draft permit, will not adversely affect human health. The Risk Assessment is discussed in greater detail in two previous letters to DAQ, namely (i) *Letter to Dr. Donald R. van der Vaart from Russell A. Fink*, dated January 14, 2011; and (ii) *Letter to Dr. Donald R. van der Vaart from Russell A. Fink*, dated March 26, 2010. However, CCC would like to re-emphasize the following points regarding the Risk Assessment, Mercury Modeling and Deposition Analysis, and Entrix Memorandum and make clear that the estimated mercury

emissions from the proposed facility will not adversely affect human health and will be well within accepted parameters:

- The Risk Assessment was conducted with approved methodology in accord with EPA recommended best practices methods from the 2005 guidance entitled *Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities*, EPA530-R-05-006. See Risk Assessment, p. 11.
- The Risk Assessment employed a multipathway exposure model and evaluated risks associated with exposure to mercury emissions from the proposed CCC facility through eating, breathing, and drinking. *Risk Assessment*, p. 5.
- Based on “standard practice for non cancer agents,” the assessment utilized EPA defined reference doses to characterize the potential significance of estimated exposures. *Risk Assessment*, p. 11.
- As a precautionary measure, the Risk Assessment utilized “conservative or cautious (i.e., health protective) assumptions” to ensure the unlikelihood “that health risks are understated.” See Risk Assessment, p. 5.
- The Risk Assessment used estimated fish consumption rates by local residents that were over and above the EPA default model of seven portions per week. *Risk Assessment*, p.6.
- Ultimately, the Risk Assessment found no adverse health effects. Specifically, it “concluded that an emission rate of 263 pounds of mercury per year is not expected to cause any adverse health effects to the population (including sensitive subgroups) in the town of Castle Hayne and other populations in New Hanover and Pender Counties from any or all pathways, for the adult and child subsistence farmers, subsistence fisher and resident scenarios.” *Risk Assessment*, p. 6. The emission limit in the Draft Permit is now 82% lower at maximum potential mercury emissions of 46 pounds per year.
- The Risk Assessment was peer reviewed by a panel of independent unbiased experts, including the former State Toxicologist for the State of North Carolina. See Risk Assessment, Appendix H.

Based on the Risk Assessment and related documents and the discussion in the letters dated January 14, 2011 and March 26, 2010, CCC has analyzed the potential impact of mercury emissions from the proposed facility and determined that mercury emissions will not cause adverse health effects to the local population.²

² CCC is aware that after the public comment period closed on October 31, 2011, a document entitled, *Air Quality Modeling and Health Impacts Assessment for Southeastern North Carolina: Technical Memorandum*, prepared by ICF International, dated November 7, 2011, was submitted to DAQ. Naturally, such document was submitted outside of the public comment period, is not part of the permitting record, and cannot be considered. In the event that such document should become part of the record in this matter, CCC reserves the right both to (a) object to the document becoming part of the record, and (b) provide additional information to rebut the assertions of such document.

Sheila Holman, DAQ Director
Dr. Donald R. van der Vaart, Permits Section Chief
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In closing, CCC appreciates the hard work by DAQ staff and the constructive changes staff members made to the Draft Permit during the review process. CCC looks forward to issuance of the final air quality permit, and moving forward with building a cement plant that will bring tremendous benefits to North Carolina.

Sincerely,



James S. Willis, P.E., P.G.
Corporate Environmental Manager

cc: Mr. Tom Mather (via e-mail – tom.mather@ncdenr.gov)
Mr. Booker Pullen (via e-mail booker.pullen@ncdenr.gov)

ATTACHMENT A

The Hearing Officer identified several issues raised in the public comments regarding the “best available control technology” (BACT) to be applied to emissions of particulate matter (PM), sulfur dioxide (SO₂), nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOCs), and greenhouse gases (GHG). Certain public comments question either the preliminary determinations reached by DAQ regarding the technology or emission limits that it determined to be BACT, or the adequacy of DAQ’s evaluation of technology in reaching its determinations.

CCC is providing the information set forth herein to assist the DAQ in reviewing and addressing or clarifying the issues raised by commenters regarding the BACT analyses and preliminary determination, as requested by the Hearing Officer. This information generally highlights information previously provided to DAQ by CCC, and references information published by the EPA, including the New Source Review Workshop Manual, 1990, (NSR Manual), AP-42 Emission Factor Guidelines for Portland Cement facilities, rules establishing the National Emission Standards for Hazardous Air Pollutants from the Portland Cement Manufacturing Industry, 40 C.F.R. Part 63, Subpart LLL (NESHAP) and the New Source Performance Standards for Portland Cement Plants, 40 C.F.R. Part 60, Subpart F (NSPS), as well as decisions of the EPA Environmental Appeals Board (EAB) regarding PSD permits.

Many of the public comments received by DAQ pertaining to the BACT analyses and preliminary determinations were submitted by the Southern Environmental Law Center (SELC) on October 31, 2011 (SELC Comments). Accordingly, the information presented below, at times, refers to the SELC Comments to fully reflect the issues summarized in the Hearing Officer’s Report. Representatives of CCC are available to discuss these issues with DAQ staff and further clarify the issues identified by the Hearing Officer.

1. The BACT Analyses Properly Took into Account the NSPS Standards

SELC alleges that DAQ improperly adopted NSPS standards as the best available control technology, and failed to conduct appropriate analyses to determine, on a case-by-case basis, the “best available” control technologies and performance levels for the CCC Portland cement manufacturing facility, as required by applicable PSD permitting requirements. SELC claims the Preliminary Determination “adopts Titan’s reverse engineering that is based on the NSPS and its BDT (best demonstrated technology) analysis, rather than the case-by-case BACT analysis required by the Act.” SELC Comments at 10-11. However, there is no basis in the record to support the assertion that DAQ failed to conduct the required case-by-case analysis and, instead, defaulted to the NSPS standards, or that it conducted sham analyses intended to reach pre-determined conclusions. Rather, the record reflects that DAQ conducted proper BACT analyses for PM, SO_s, NO_x, CO, VOCs and GHGs in accordance with all applicable requirements.

The Control Technology Analysis (April 2011) prepared by CCC and submitted to DAQ as part of its permit application identified, considered, and ultimately selected control options based upon a review of information contained in: (1) the RACT/BACT/LAER Clearinghouse (RBLC) database, (2) surveys of available literature in technical journals, (3) recent EPA rulemakings regarding Portland cement facilities, including the NSPS and NESHAP rules adopted on September 9, 2010, (4) and a review of PSD permits issued for Portland cement

facilities. See Control Technology Analysis at 4. The Preliminary Determination prepared by DAQ summarizes and evaluates all of this information, not only the information pertaining to the NSPS rulemaking.

The NSPS rulemaking is, however, a valuable source of timely and relevant information, because it represents EPA's very recent analysis of the best technologies and control options available to control emissions from Portland cement facilities. In establishing "best demonstrated technology" (BDT) standards for the NSPS rule in 2010, EPA considered substantially the same information that DAQ may consider in establishing BACT limits for the CCC air permit. In its proposed NSPS rule, EPA explained:

Common sources of information as to what constitutes best demonstrated technology, and for assessing that technology's level of performance, include best available control technology (BACT) determinations made as part of new source review, emissions limits that exist in State and Federal permits for recently permitted sources, and emission test data for demonstrated control technologies collected for compliance demonstration or other purposes.

73 Fed. Reg. 34072, 34073 (June 16, 2008). The EPA NSR Manual expressly directs permit applicants and permitting authorities to consider this same information in making BACT determinations. See NSR Manual at B-11. Moreover, EPA discussed the similarities between BDT and BACT in the proposed NSPS rule, as follows:

In determining BDT we generally look at the controls and control performance of new sources. In the case of cement kilns we reviewed recently issued permits and BACT determinations issued by States to identify emission limits more stringent than the current (NSPS). We believe that the use of State permit data and BACT determinations developed as part of new source review is appropriate because a BACT determination evaluates available controls, their performance, cost, and non-air environmental impacts. The main difference between those determinations and a BDT determination for purposes of a new source performance standard is that a BACT determination is made on a site-specific basis (and may reflect site-specific considerations).

73 Fed. Reg. 34072, 34075 (June 16, 2008). The exhaustive evaluation of available controls for the development of BDT standards in the NSPS rule that EPA completed in 2010 focused on recent BACT determinations and PSD permits, just as DAQ's BACT analyses for the Draft Permit considered recent BACT determinations and PSD permits. In sum, EPA and DAQ conducted a similar analysis of similar information over a similar time period in their respective evaluations of available controls for new Portland cement facilities and their level of performance, so it is not surprising that they each reached similar conclusions. This does not mean, and the record does not reflect, that DAQ abdicated its responsibility to conduct an independent, site-specific review of CCC's permit application pursuant to applicable PSD requirements, and SELC's assertion that DAQ simply adopted the NSPS standards by default is without merit and without support in the record.

2. DAQ's BACT Analyses Independently Evaluated Appropriate Information

SELC mistakenly asserts that DAQ's BACT analyses lack the necessary independent evaluation of information submitted by CCC and that DAQ's review of information was restricted to the RBLC database and subsequently lacked the information and analysis necessary to critique CCC's application. SELC Comments at 12-13.

There is no basis in the record to support SELC's assertion that DAQ's BACT analyses and preliminary determination lacked independence or was limited to the consideration of information in the RBLC database. At the outset we note the apparent conflict between SELC's assertion that DAQ's BACT analysis relies only upon the information contained in the RBLC database, and its previous assertion that DAQ relies only upon the EPA's analysis of BDT in the NSPS rulemaking, which considered substantial information beyond that contained in the RBLC database. Thus, it is not possible that DAQ considered only the information in the RBLC database and only the information considered by EPA in the development of the NSPS rule.

Further, with respect to the independence of DAQ's analysis, the NSR Manual counsels that, as a first step in the evaluation of control technologies, "the applicant should make a good faith effort to compile appropriate information from available information sources, including any sources identified as necessary by the permit agency. The permit agency should review the background search and resulting list of control alternatives presented by the applicant to check that it is complete and comprehensive." NSR Manual at B-11. The NSR Manual further provides that, "It is important to note that, regardless of the control level proposed by the applicant as BACT, the ultimate BACT decision is made by the permit issuing agency after public review." Id. at B-53.

In this case, CCC presented a comprehensive list of available control technologies in its Control Technology Analysis initially submitted to DAQ on February 25, 2008, and revised and resubmitted to include additional information and analyses several times at DAQ's request, most recently on April 5, 2011. As noted above, the Control Technology Analysis identified and considered control options based upon a review of a broad range of applicable information. For example, in addition to the information contained in the RBLC database, the analyses considered PSD permits recently issued for Portland cement facilities, and these permits are identified on page 17 (PM), page 39 (SO₂), page 60 (NO_x), page 70 (CO), and page 71 (VOCs).

The Preliminary Determination prepared by DAQ summarizes and evaluates all of the information that CCC presented, and reflects DAQ's determination that the list of available technologies identified is "complete and comprehensive," as suggested by the NSR Manual. Although the Preliminary Determination does not robotically repeat every word of CCC's Control Technology Analysis, DAQ plainly considered all of the information contained therein, which has been posted on its website and part of the record since at least April 2011, and summarized the key points on pages 85 through 124 of the Preliminary Determination.

Accordingly, there is no merit to the SELC's assertion that DAQ's BACT analyses lacks independence. DAQ did not blindly accept CCC's BACT analyses, but evaluated the information provided by CCC against its vast experience reviewing PSD permit applications, the substantial body of information about control options for Portland cement facilities that was recently compiled by EPA, and other relevant information. Several times, DAQ requested and received additional information and analyses. Thus, there is no basis in the record to support

SELC's assertion that DAQ abdicated its responsibility to properly examine the information provided by CCC in support of its PSD permit application.

3. DAQ Properly Evaluated the Range and Performance of Potential Control Technologies

SELC also broadly asserts that, “[s]everal of the technologies evaluated in the BACT analysis have a range of efficiencies, yet were evaluated for a single efficiency, which was calculated based on BDT. ... the control technologies proposed by Titan and reviewed by DAQ can and have achieved greater efficiencies in practice than DAQ has included in the Draft Permit.” SELC Comments at 12. SELC frames its critique as a failure to properly *evaluate* a wider range of technologies and control efficiencies, but at bottom its comment concentrates, not so much on what range of control efficiencies DAQ did or did not evaluate, but on its decision not to accept as BACT the higher control efficiencies observed in a handful of individual performance tests conducted at other Portland cement facilities.

The adequacy of DAQ's BACT analyses and determinations are further addressed in the specific context of each control option and performance level discussed further below, however, as a general matter, the record shows that DAQ properly evaluated technologies and performance levels. For example, the NSR Manual provides that:

Many control techniques, including add-on controls and inherently lower polluting processes, can perform at a wide range of levels. Scubbers, high and low efficiency ESPs and low VOC coatings are examples of just a few. It is not EPA's intention to require analysis of each possible level of efficiency for a control technique, as such an analysis would result in a large number of options. Rather, the applicant should use the most recent regulatory determinations and performance data for identifying the emissions performance level(s) to be evaluated in all cases.

NSR Manual at B-24.

In this case, CCC and DAQ evaluated the most recent regulatory determinations and performance data, including but not limited to the recent PSD permits issued for other Portland cement facilities, as noted on pages 17, 39, 60, 70, and page 71 of the Control Technology Analysis, and the performance data cited by EPA in the recent adoption of BDT and MACT standards. The determination of performance levels that have been demonstrated and represent BACT were guided by these recent regulatory decisions and performance data. The NSR Manual further suggests that, “Manufacturer's data, engineering estimates and the experience of other sources provide the basis for determining achievable limits.” NSR Manual at B-24. DAQ evaluated the manufacturers data and engineering estimates that CCC provided in its permit application and supporting materials, including, for example, the data and calculations reflected in Tab C of the application materials.

At various points in its comments, SELC notes certain performance tests conducted at other Portland cement facilities that are purported to have shown lower observed emission rates than the emission limits DAQ has proposed as BACT in the Draft Permit. SELC points to these performance tests in an attempt to show that the BACT limits for PM, SO₂ and NO_x proposed in the Draft Permit do not represent BACT or that DAQ failed to properly consider these performance tests in its evaluation. These assertions are incorrect. First, we understand DAQ

has, in fact, considered all of the performance test data cited by SELC and concluded that it does not compel different BACT determinations than those proposed in the draft PSD permit, which reflect DAQ's consideration of the information referenced above.

Second, we believe SELC confuses "emission rates" observed in performance tests with "emission limitations" established as BACT in PSD permits, which must also account for applicable long-term, site-specific variability due to materials and operating conditions. While performance test data can be useful, particularly to verify that BACT limits established in PSD permits have been achieved in practice, such test data represent only the emission rate observed at a specific time and place, and does not ordinarily represent a BACT limit that can be achieved continuously over the life of a facility. See NSR Manual at B-23, and NSPS Proposed Rule at 73 Fed. Reg. 34072, 34075. SELC erroneously asks DAQ to establish BACT limits for the CCC facility based upon the emission rates observed in limited individual performance tests conducted at other Portland cement facilities, without regard for whether those emission rates have been demonstrated to be achievable continuously over the long term. Moreover, SELC cherry picks performance test results and asks DAQ to accept these emission rates as BACT, without indicating, much less demonstrating, whether these tests were conducted under comparable operating parameters, using the same raw materials, test methods, averaging times and other variables as those specified in the draft PSD permit for CCC. SELC Comments at 16.

The EPA Environmental Appeals Board (EAB) recently described the establishment of BACT performance levels, including the use of specific performance test results to establish BACT limits, as follows:

The BACT analysis, however, must be solidly grounded in what is presently known about the selected technology's effectiveness at controlling pollutant emissions. We have observed that in reaching the facility-specific result, the emission limitations achieved by other facilities, and corresponding control technologies used at other facilities are an important source of information in determining what constitutes best available. Likewise, the word achievable used in the statute and regulations, although forward looking, also constrains the permit issuers discretion by prohibiting BACT limits that would require pollution reductions greater than what can be achieved with available methods. ...

We have recognized that the available data on the past performance of the selected technology may show that the control efficiency achievable through the use of technology may fluctuate so that it would not always achieve its optimal control efficiency. In addition, test method variability may result in observed emission rate fluctuations. Further, due to characteristics of individual plant processes, we recognize that application of identical technology may not yield identical emission limits.

We recently explained that the underlying principle in all of these cases is that PSD permit limits are not necessarily a direct translation of the lowest emission rate that has been achieved by a particular technology at another facility, but that those limits must also reflect consideration of any practical difficulties associated with using the control technology. Thus, we have held that a permit writer is not required to set the emission limit at the most stringent emission rate that has been demonstrated by a facility using similar emissions control technology.

Instead, permit writers retain discretion to set BACT levels that do not necessarily reflect the highest possible control efficiencies but rather, will allow permittees to achieve compliance on a consistent basis.

In essence, the Agency guidance and our prior decisions recognize a distinction between, on the one hand, measured “emission rates,” which are necessarily data obtained from a particular facility at a specific time, and on the other hand, the “emission limitation” determined to be BACT and set forth in a permit, which the facility is required to continuously meet throughout the facility’s life. ... Accordingly, because the “emission limitation” is applicable for the facility’s life, it is wholly appropriate for the permit issuer to consider, as part of the BACT analysis, the extent to which the available data demonstrate whether the emission rate at issue has been achieved by other facilities over a long term. Thus, the permit issuer may take into account the absence of long term data, or the unproven long term effectiveness of the technology in setting the emission limitation that is BACT for the facility. (Internal citations omitted.)

In Re: Newmont Nevada Energy Investment LLC, TS Power Plant, 12 E.A.D. 429, 441-442 (EAB 2005).

The *Newmont* decision and other applicable EAB precedents support the proposed BACT emission limits proposed in the draft PSD permit, and DAQ’s decision to reject as BACT emission rates observed in individual tests, based on its conclusion that those rates cannot be achieved continuously, over a long period of time, and under the site-specific conditions present at the CCC facility See also: *In re Masonite Corp.*, 5 E.A.D. 551, 560 (EAB 1994); *In re Pennsauken County NJ Res. Recovery Facility*, 2 E.A.D. 768, 769-770 (Adm’r 1989); *In re Knauf Fiberglass GmbH*, 9 E.A.D. 1, 15 (EAB 2000); *In re Steel Dynamics, Inc.*, 9 E.A.D. 165, 188 (EAB 2000).

4. DAQ Properly Evaluated and Determined BACT for PM

a. DAQ conducted a proper BACT analysis for PM-2.5

SELC asserts that CCC “failed to submit and DAQ failed to conduct a PM-2.5 BACT analysis,” and that DAQ “cannot lawfully issue a permit for this facility until this pollutant is properly addressed.” SELC Comments at 13. SELC’s comment is factually incorrect. The subsequent revision of the BACT analysis submitted by CCC to DAQ in February 2011 and updated in April 2011 address PM, PM-10 and PM-2.5, and collectively refers to them as PM, but applies to each fraction individually. According to the EPA Emission Factor Guideline for Portland Cement Manufacturing, PM-2.5 represents approximately 45% of the PM emitted by a dry process portland cement kiln with a fabric filter control. However, the revised CCC BACT analysis for PM assumes that all PM emitted by the kiln system is PM-2.5, based on the demonstrated emission profile of a membrane bag and wet scrubber. This is also supported by particle size distribution studies conducted by the Portland Cement Association. See *Development of PM-2.5 NAAQS Compliance Demonstration Tool*, 2009, PCS R&D Serial No SN3126. The control options selected by DAQ for the kiln system – membrane bag filters and a wet scrubber – represent the maximum reduction of PM-2.5 achievable. This also represents the

maximum reduction achievable for PM-10 and larger size particles. In addition, all condensable PM from the cement kiln in accordance with standard practice is assumed to be PM-2.5, and the Draft Permit establishes a separate limit for condensable PM-2.5. For the bag filters proposed to control all other sources of PM at the facility, 90% of the PM (all of which is filterable) is assumed to be PM-2.5.

To identify the control options and performance levels for PM-2.5 emitted by Portland cement kiln systems that represent the maximum degree of reduction achievable, CCC reviewed the RBLC database, recent PSD permits issued for new Portland cement facilities, technical literature, and EPA's recent NSPS and NESHAP rulemaking for Portland cement facilities. The review revealed limited information regarding control technologies and corresponding performance levels specifically designed or established for PM-2.5. For example, CCC did not identify a PM-2.5 BACT limit set for a Portland cement plant in its review of recent regulatory decisions, including recent BACT determinations and EPA's recent analysis of "maximum achievable" and "best demonstrated" PM controls on Portland cement plants. A further review of the RBLC database conducted by CCC on January 16, 2012 did not reveal any new information. This is not surprising. EPA began regulating PM-2.5 separately from PM-10 for PSD purposes, beginning with the adoption of the PM-2.5 Implementation Rule on May 16, 2008, 73 Fed. Reg. 28,321, however, the PSD requirements in this rule were administratively stayed until late 2010. State permitting agencies have, in turn, only begun regulating PM-2.5 through State Implementation Plans in the past year. Accordingly, while advances have been made in methods to measure PM-2.5, allowing emission limits to be set for PM-2.5, including condensables, without relying upon PM-10 as a surrogate, limited information about control technologies and corresponding emission limits designed specifically to control PM-2.5 from Portland cement plants has been documented in regulatory decisions. The EPA's discussion of particulate matter controls throughout the recent NSPS and NESHAP rulemaking for Portland cement manufacturing facilities acknowledges this state of affairs, and is underscored by its decisions not to set separate standards for PM-2.5.

In this case, the CCC BACT analysis for PM-2.5 concluded that the most stringent performance levels achievable for PM-2.5 is a membrane bag filter to capture more than 99% of the filterable PM-2.5, and wet scrubber to control the condensable portion of PM-2.5. DAQ reviewed and properly selected these control options as BACT for PM-2.5 for the kiln system emissions. By controlling the finest measurable fractions of PM to the maximum degree achievable, these control options also represent BACT for PM-10 and larger particles, which will be controlled to at least the same degree by these control technologies.

b. DAQ properly addressed condensable PM

SELC further asserts that DAQ must quantify the reduction of condensable PM provided by the wet scrubber, and set a BACT limit accordingly. SELC Comments at 14. This assertion is incorrect. With respect to the condensable portion of PM-10 and PM-2.5, EPA concluded in 2010 that there is currently insufficient data available to evaluate emissions and the best available controls for condensable PM. In publishing the final NESHAP and NSPS for Portland cement facilities, EPA decided not to establish separate limits for condensable PM. See 75 Fed. Reg. 54970, 55020 (September 9, 2010). The lack of available data has not changed in the months since EPA reached this conclusion, making it difficult to quantify the capabilities of various potential control technologies. In addition, the EPA Environmental Appeals Board has

considered similar issues and held that permitting agencies are not required to conduct a separate BACT analysis or establish BACT limits for “condensables.” See Newmont at 24.

At the same time, while no BACT determination of the available control options for condensable PM is required, DAQ requires all PSD permits to include limits for both filterable and condensable PM. Therefore, the Draft Permit includes a PM-10/PM-2.5 condensable limit requiring 50% removal efficiency across the wet scrubber using Reference Method 202, which corresponds to a limit of 0.08 lb/ton of clinker. See Draft Permit at 48. This limit is based upon estimated condensable inlet concentrations and engineering estimates of the removal efficiency of the wet scrubber. For these reasons, the record does not support SELC’s assertion that DAQ failed to properly address the condensable portion of PM in the Draft Permit.

c. DAQ did not improperly rely on the NESHAP/MACT standard

SELC asserts that DAQ failed to conduct a BACT analysis for PM and instead relied entirely upon the PM standards adopted by EPA in 2010 in its NSPS/NESHAP regulations, and in so doing DAQ failed to consider performance tests reviewed by EPA in those rulemakings that in some cases showed PM emission levels below 0.0145 lbs/ton of clinker, the limit DAQ determined to be BACT for the CCC facility. SELC Comments at 14. However, as discussed at length above, DAQ conducted an appropriate BACT analysis for PM and did not improperly rely on the NSPS/NESHAP standards adopted by EPA last year. Rather, DAQ and EPA each reviewed similar regulatory decisions and performance data over a similar time period and reached similar conclusions in their respective analyses of the best available controls for PM emissions from Portland cement facilities. For example, in its NSPS proposal, EPA points out that fabric filters and Electrostatic Precipitators (ESPs) “continue to be the most effective PM controls in use, capable of removing over 99.9 percent of the PM from exhaust gas.” 73 Fed. Reg. 34072, 34076. Based upon DAQ’s review of recent BACT determinations and performance data, the Draft Permit and Preliminary Determination similarly require the installation of a fabric filter designed to achieve a control efficiency of at least 99.9% and an emission limit of 0.0145 lbs/ton of clinker, which is approximately equivalent to 0.0008 gr/dscf on a 30-day rolling average, based on Reference Method 5. See Control Technology Analysis at 12, 19.

Moreover, in its extensive analysis of available control options for its NSPS rulemaking, EPA reviewed “data on PM limits in eight recently issued permits for new cement kilns, all of which were equipped with fabric filters. The PM limits ranged from 0.093 to 0.28 lbs/ton of clinker, and the average was 0.16 lbs/ton.” 73 Fed. Reg. 34072, 34076. Significantly, the BACT limit for PM in the CCC Draft Permit is lower than the PM limits in each of these permits recently issued for new Portland cement plants. EPA also reviewed performance tests in the development of the NSPS standards. EPA reviewed 21 emission tests of Portland cement kilns equipped with fabric filters using membrane bags in which PM emissions ranged from 0.0023 up to 0.4724 lbs/ton of clinker, with a median of 0.1360 lbs/ton. EPA further reviewed 37 emission tests for PM from Florida kilns equipped with fabric filters where the bag type was unknown, which showed a range from 0.015 lbs/ton to 0.153 lbs/ton. EPA also reviewed 19 emission tests conducted on four Portland cement kilns constructed in the last ten years with “the latest fabric filter design.” Individual test results showed PM emissions ranging from 0.0023 lbs/ton to 0.1076 lbs/ton of clinker, with an average of 0.0357 lbs/ton. 73 Fed. Reg. 34072, 34076-34077.

As more fully outlined above, most control devices operate on a range of control efficiencies and performance levels that may vary from one source to another based on site-

specific conditions, and may also vary for the same source over time based on fluctuations in operating conditions. Therefore, EPA has long recognized that a BACT limit that must be met continuously over a long term is not necessarily the direct translation of the lowest emission rate ever observed on a similar source. The performance data cited by SELC does not support its position; rather, the data reveals the wide variation in performance from one source to another based on site-specific conditions, and variations for the same source over time based on fluctuations in operating conditions. In this case, DAQ properly concluded that the BACT limit it proposed for PM in the Draft Permit is not in tension with the range of performance test data reviewed by EPA in the development of NSPS and NESHAP standards. SELC does not argue or explain how these tests compel a different BACT determination in this case; rather SELC merely cites the existence of the tests and claims that DAQ did not consider them, and as such SELC does not provide any valid basis to change the BACT determination.

For the reasons summarized above, any assertions that the stringent PM limit proposed by DAQ in the Draft Permit is not BACT are without merit.

5. DAQ Properly Evaluated and Determined BACT for SO₂

a. DAQ properly considered raw materials

SELC asserts that DAQ has an obligation to consider requiring raw materials substitution, in this case, the importation of limestone from other quarries, to achieve lower SO₂ emission rates, and argues that DAQ erred by not evaluating this as a control option in its BACT analysis for SO₂. SELC Comments at 15-16. SELC's argument is without merit and misapprehends the applicable PSD requirements by overlooking EPA guidance and judicial precedent. As discussed below, DAQ was not required to consider raw materials from beyond the project as it appears in the air permit application.

In an earlier NESHAP rulemaking, EPA explicitly recognized that Portland cement manufacturing facilities are routinely located near quarries that supply limestone and other raw materials. In considering mercury emissions, for example, EPA noted that cement plants should not be required to consider limestone beyond the proposed quarry:

Portland cement plants are typically located at or near a limestone quarry because the economics of the Portland cement industry require minimal transportation costs. If we were to now require sources to ship raw low mercury limestone over potentially long distances to reduce mercury emissions, it would change the economics of the plant so significantly that the plant would not be the same class or type of source compared to facilities that happened to have low-mercury limestone located nearby (or, at least, had happened on a vein of low mercury limestone at the time of its performance test). Because limestone's composition varies with location, limestone must be processed locally to be profitable, Portland cement plants must formulate the mixture of limestone with other materials to attain the desired composition and performance characteristics of their product, and access to limestone is exclusive to each Portland cement plant (i.e., no plant typically can gain access to another plant's limestone).

National Emission Standards for Hazardous Air Pollutants From the Portland Cement Manufacturing Industry, Proposed Rule, 70 Fed. Reg. 72333 (December 2, 2005).

EPA has consistently applied its longstanding policy against redefining, in a BACT analysis, the basic design of a proposed source. The NSR Manual states, “Historically, EPA has not considered the BACT requirement as a means to redefine the design of the source when considering available control alternatives.” NSR Manual at B-13. The EAB has affirmed that, “EPA has not generally required a source to change (i.e., redefine) its basic design.” *In re Knauf Fiber Glass, GmbH*, 8 E.A.D. 121, 136 (EAB 1999). Here, any BACT determination for a mine-mouth plant that required the use of raw materials from another mine or quarry would impermissibly redefine the basic design of the proposed plant.

Additionally, judicial precedent supports this position. In *In re Prairie State Generating Co.*, PSD Appeal No. 05-05 (August 24, 2006), EPA squarely addressed this policy in the context of a proposed mine-mouth plant, a power plant co-located with a coal mine, similar to the CCC proposed facility. In reviewing a petition by third parties challenging Illinois EPA’s BACT determination for SO₂ that did not consider the use of lower sulfur coal available from more distant locations, the EAB rejected this assertion because it would change the basic project covered by the application. *See Prairie State* at 16. Applying the “redefining the source doctrine,” the EAB affirmed the decision of the Illinois EPA not to consider raw materials substitution as part of its BACT analysis for SO₂. The EAB decision in *Prairie State* was affirmed by the Seventh Circuit in *Sierra Club v. EPA*, 499 F. 3d 653 (7th Cir. 2007).

Finally, even if DAQ were to evaluate raw materials substitution as a possible SO₂ control option, the prohibitively high costs would be immediately recognized as so obviously excessive in relation to the potential SO₂ removal that it “may be rejected without engaging in exhaustive cost-effectiveness calculations.” *In re Masonite Corp.*, 5 E.A.D. 551, 566 (EAB 1994). For all of these reasons, SELC’s position that DAQ’s BACT analysis is flawed because it did not investigate raw materials substitution is without merit. Under the Draft Permit, the CCC SO₂ emission rates will be 95% lower than was typical for older wet plants, such as the former Ideal Cement plant, and 70% lower than the SO₂ limit proposed in the 2009 draft permit for CCC.

b. DAQ properly evaluated control technologies for SO₂ emissions and established an appropriate BACT level

The Draft Permit establishes a BACT limit for SO₂ of 0.4 lb per ton of clinker, or alternatively, requires a 90% control efficiency across the wet scrubber. Draft Permit at 46. SELC has asserted that the 90% option is only available for those facilities that cannot reduce SO₂ emissions below 0.4 lbs/ton of clinker and that the 90% control efficiency option is intended only to apply where the sulfur content of the raw materials is so high that kiln cannot meet an emissions limit of 0.4 lbs/ton of clinker. SELC Comments at 18.

SELC is correct insofar as the 90% control efficiency alternative standard in the NSPS rule and in DAQ’s BACT determination is intended to apply when raw materials with very high sulfur content are used. In such a case, a well-operating wet scrubber would be expected to reliably capture 90% of the SO₂, and SO₂ emissions would still be above 0.4 lb per ton of clinker. Based on the sulfur content of raw materials that CCC will use, CCC does not anticipate that the 90% reduction alternative would be applicable. However, it is appropriate for DAQ to

include this alternative limit in the PSD permit, in the unlikely event that very high-sulfur raw materials are encountered, as recognized and supported by EPA in the NSPS rule.

DAQ conducted a detailed evaluation of a range of control technologies for SO₂ emissions. See Preliminary Determination at 95-102. Despite this thorough review, certain written comments critique the scope of the DAQ evaluation. SELC asserts that “DAQ failed to evaluate use of a wet scrubber designed to work at 90% efficiency” and “there is no basis for DAQ’s finding that 85% control represents BACT.” SELC Comments at 16. That assertion is factually incorrect. DAQ set a SO₂ BACT limit of 0.4 lbs per ton of clinker based on its evaluation of the specific sulfur inputs and expected scrubber efficiency for the CCC kiln system. See Permit Application Materials at Tab D, dated April 5, 2011. This evaluation considered the effectiveness of wet scrubbers relative to the SO₂ inlet concentrations. Specifically, DAQ’s BACT analysis documents that kiln systems with high SO₂ inlet concentrations, such as the Portland cement plants cited in performance test data referenced by the SELC, can reliably achieve 90% or more removal effectiveness with a wet scrubber; however, the BACT analysis documents that for plants with a relatively low SO₂ inlet concentration, such as the CCC plant, the wet scrubber can only be anticipated to perform reliably at 85% efficiency. DAQ applied this 85% control efficiency to the projected SO₂ inlet concentrations for the CCC plant yielding the BACT limit of 0.4 lbs per ton of clinker. CCC will design the wet scrubber to achieve the greatest practical SO₂ removal under all conditions, while the SO₂ removal efficiency may vary with variations in inlet concentrations due to natural variations in the raw materials and the kiln operating conditions (i.e., raw mill on or off). To account for variability, expected worst-case conditions have been evaluated in DAQ’s analyses. Higher actual removal efficiencies are expected to occur under various conditions, but cannot be continuously achieved and are therefore not appropriately set as BACT limitations. This approach to process or control device variability is consistent with the guidance EPA provides in the NSR Manual and decisions of the EAB. See NSR Manual at 23-24; *In re Masonite Corp.*, 5 E.A.D. 551, 560 (EAB 1994).

Next, SELC asserts that DAQ improperly excluded certain control technology and cites limited performance test data from kilns in Iowa, Texas, and Michigan. SELC appears to cite these limited examples to support its position that, if one test of a wet scrubber could achieve 99% removal of SO₂ on one occasion, then all facilities should be able to achieve 99% removal at all times under all conditions. See SELC Comments at 16. As some of the performance data referenced by SELC shows, higher efficiencies have been achieved at certain places and times, depending upon the raw materials used and other variables. However, the evidence in the record does not demonstrate that these levels would be met continuously over the life of the CCC facility, and therefore they do not represent BACT. For example, higher inlet concentrations of SO₂ will ordinarily result in higher wet scrubber control efficiencies, and conversely, lower inlet concentrations will yield lower control efficiencies. EPA expressly recognizes this relationship between SO₂ inlet concentrations and wet scrubber control efficiencies in the recently adopted NSPS rule. See EPA Proposed NSPS Rule, 73 Fed. Reg. 34072, 34080-34081. In this way, the control efficiency of a wet scrubber may vary depending upon the sulfur content of the raw materials used, which itself may vary within a single quarry. Thus, the very high control efficiency achieved by the referenced Texas facility is likely attributable in part to the very high sulfur content of the limestone quarried in that location, and the resulting high inlet concentration to the scrubber. In the BACT analysis, CCC and DAQ evaluated this performance test information. Control Technology Analysis at 26-27. In fact, in April 2011 at DAQ’s request,

CCC prepared and submitted additional evaluations regarding the effectiveness of wet scrubbers with low, moderate, or high SO₂ input. Furthermore, the table of recent BACT determinations included in the Control Technology Analysis identified certain Portland cement manufacturing plants in the United States that have lower SO₂ emission limits. In these few instances, the lower SO₂ emission rates are the result of very low sulfur concentrations in the site-specific limestone. These Portland cement plants do not operate any special control technology to achieve lower SO₂ emission limits, rather the SO₂ emissions are the result of naturally very low pyritic sulfur in the limestone.

DAQ evaluated all of the above data and concluded that for the CCC facility a BACT limit of 0.4 lb. per ton of clinker based on a wet scrubber designed to achieve at least a 85% control efficiency is appropriate. As demonstrated by the discussion above, DAQ properly considered the limited performance tests conducted at other Portland cement plants that indicated lower SO₂ emissions or higher removal rates for wet scrubbers. SELC's assertion to the contrary is without merit.

c. DAQ properly evaluated cost-effectiveness of control options

DAQ properly evaluated the cost-effectiveness of emissions control options in its BACT analysis of SO₂. However, comments to DAQ mistakenly criticize DAQ's analysis. First, with no factual support for its position whatsoever, SELC claims that the projected capital costs for the wet scrubber are "inflated." SELC Comments at 17. On the contrary, the capital costs were projected using the methodology in the EPA Control Cost Manual, and the wet scrubber costs are based on the cost estimates EPA developed for the proposed Portland Cement NSPS, scaled up to CCC's production rate. The kiln system proposed by CCC is about twice the production capacity of the kiln EPA used to model costs and other parameters. See Summary of Environmental and Cost Impacts of Proposed Revisions to Portland Cement New Source Performance Standards (40 CFR Part 60, subpart F), Docket Number EPA-HQ-OAR-2007-0877 (May 29, 2008).

Second, SELC further claims that DAQ improperly excluded as BACT certain technically feasible SO₂ control options, in addition to a wet scrubber, based upon economic considerations. SELC claims the justification is lacking because it relies upon a comparison of "incremental" cost-effectiveness calculations to show that the costs for each of several control options beyond a wet scrubber are excessive. This argument is without merit.

"To justify elimination of an alternative on (economic) grounds, the applicant should demonstrate to the satisfaction of the permitting agency that the costs of pollutant removal (e.g., dollars per ton removed), for the control alternative are disproportionately high when compared to the cost of control for the pollutant in recent BACT determinations. Specifically, the applicant should document that the cost to the applicant of the control alternative is significantly beyond the range of recent costs normally associated with BACT for the type of facility (or BACT control costs in general) for the pollutant." NSR Manual at B-45. In *In re Steel Dynamics*, 9 E.A.D. 165, 202 (EAB 2001), the Environmental Appeals Board summarized the task this way:

The agency will compare a control option's cost-effectiveness with what other companies in the same industry have been required to pay in recent BACT determinations to remove a ton of the same pollutant. In most cases, a control option is determined to be economically achievable if its cost-effectiveness is

within the range of costs being borne by other sources of the same type to control the pollutant.

In this case, CCC documented in its SO₂ BACT analysis that most Portland cement facilities have been required to meet the maximum degree of SO₂ reduction achievable by reliance upon the inherent scrubbing ability of the naturally alkaline raw materials used in the cement manufacturing process, without the installation of add-on controls. See CCC's Control Technology Analysis at 39; DAQ's Preliminary Determination at 95-96. According to the EPA Emission Factor Guideline for Portland Cement Manufacturing, "[d]epending upon the process and the source of the sulfur, SO₂ absorption ranges from 70 percent to 95 percent." AP-42 Emission Factor Guideline at 11.6-6. In addition to inherent scrubbing, recent BACT determinations have required Portland cement facilities with high sulfur raw materials to install wet scrubber or lime injection systems to control SO₂. Based on our research, no Portland cement facility has ever been required to install and operate further SO₂ controls, in addition to inherent scrubbing and a wet scrubber or a lime injection system. CCC's BACT analysis relied on recent BACT determinations and other available data, including EPA's recent analysis of maximum achievable and best demonstrated technologies for its NSPS and NESHAP standards.

For the CCC plant, DAQ set a BACT emission limit of 0.4 lbs per ton of clinker based upon inherent scrubbing and the installation and use of a wet scrubber system. Applying the methodology set forth in the EPA Pollution Control Cost Manual, CCC projects the capital cost for this control option is \$35.8 million, with annualized costs of \$8.2 million and a cost-effectiveness of \$3,337 per ton of SO₂ reduced. In its BACT analysis, CCC evaluated further SO₂ control deemed to be technically feasible, insofar as they are available and applicable, including wet absorbent addition, dry absorbent addition, D-Sox cyclone and lime hydrator. Capital costs for each of these control options ranged from \$1.1 million to \$4.5 million (with even higher costs to install multiple devices), and an incremental cost-effectiveness ranging from an additional \$5,776 per ton of SO₂ removed to \$17,156 per ton of SO₂ removed. It is appropriate to focus on incremental costs when considering, as here, multiple add-on controls aligned in series.

In its BACT analysis, CCC documented that no other Portland cement facility has ever been required to install SO₂ controls in addition to inherent scrubbing and a wet scrubber or a lime injection system, and incur the corresponding additional incremental costs associated with such controls. Accordingly, CCC concluded that the cost-effectiveness of these controls is "significantly beyond the range" and "disproportionately high" when compared with "what other companies in the same industry have been required to pay in recent BACT determinations to remove a ton of the same pollutant." Moreover, although not determinative, this is consistent with EPA's determination that SO₂ removal costs in this range are not cost-effective in the context of its analysis of best demonstrated technology for the NSPS rulemaking. See Proposed NSPS Rule, 73 Fed. Reg. 34072, 34081 (June 16, 2008). CCC properly excluded these additional control options as not economically reasonable.

The CCC BACT analysis of additional control options beyond the wet scrubber did not proceed to evaluate other impacts once the economic evaluation indicated that these options were not reasonable. However, these additional controls would also have adverse product quality and environmental impacts. Adding additional lime to the kiln system will: (1) change the process chemistry by increasing "burnability" and thereby require the use of additional fuel; (2) increase NO_x and CO emissions due to increased burnability and fuel use; (3) adversely impact product

quality by increasing the amount of free-lime in the product; and, (4) reduce the removal efficiency of the wet scrubber by reducing the SO₂ inlet concentration. Such adverse environmental and product quality impacts provide further support for excluding these additional control options.

Thus, as discussed above, the DAQ's SO₂ BACT analysis and determination of SO₂ BACT limits are well grounded and supported by the record. SELC's claims to the contrary are without merit.

6. DAQ Properly Evaluated and Determined BACT for NO_x

Certain public comments also allege short-comings in the DAQ analysis and determination of BACT for NO_x. However, as discussed below, DAQ properly conducted the BACT analysis, and the objections are unfounded.

a. The NO_x BACT analysis properly rejected Selected Catalytic Reduction (SCR) technology

SELC contends that the NO_x emission limit specified in the Draft Permit and the use of the Selective Non-Catalytic Reduction (SNCR) technology to control NO_x emissions does not represent the "best available" control technology, because DAQ did not consider and should have required the use of Selected Catalytic Reduction (SCR), which is capable of achieving lower NO_x emission rates. See SELC Comments at 19-21. There is no merit to these contentions because EPA recently considered this very issue in its adoption of the NSPS rule in 2010 and determined that generally SCR is not an effective NO_x control technology for this type of source.

Although SCR control technology has been installed on several Portland cement plants in Europe, these are considerably smaller facilities with very different process parameters and emission profiles than the CCC plant and most Portland cement plants operated in the United States. EPA itself thoroughly evaluated these applications of SCR technology to small European plants, but rejected the technology concluding it would not be effective on most new Portland cement plants. EPA based this decision on several technical considerations that are explained in detail in EPA's "Alternative Control Techniques Document Update - NO_x Emissions from New Cement Kilns," November 2007, and in the preamble to the NSPS rule published September 9, 2010. See 75 Fed. Reg. 54970, 54994-54995 (Sept. 9, 2010). EPA concluded that "SCR currently is not demonstrated in the United States." See "Summary of Environmental and Cost Impacts of Final Revisions to Portland Cement New Source Performance Standards," August 6, 2010, at 4. Accordingly, DAQ properly concluded, that SNCR is the "best available" NO_x emission control technology for the CCC plant.

The evaluation of technologies for NO_x control, including SCR and SNCR, is thoroughly discussed in the Preliminary Determination. See Preliminary Determination at 112-113. Although SCR has been applied in a few special cases for cement plants overseas, they have not worked reliably, they are not applicable to the type of plant proposed for CCC, and they have never been applied in the U.S. A German cement plant one-third the size of CCC with both SNCR and SCR systems has not used the SCR system due to operational difficulties since 2006, has very low sulfur and alkalis in their raw materials which when present clog SCR media and are present in CCC's raw materials, and their NO_x emission rate limit is higher than CCC's limit.

An Italian cement plant one-third the size of CCC has operated a SCR system but only must meet a NO_x emission rate limit that is more than twice the limit for CCC. Another Italian plant with an SCR system is an older semi-dry kiln and does not compare to the modern pre-heater/pre-calciner kiln for CCC. There is one cement manufacturer who has agreed as part of a consent order to build one SCR unit at a U.S. cement plant, but the agreement is written in such a manner that it is not definite when or where this would be built. Furthermore, under that consent order all other affected plants are only required to install SNCR, and as such, the SCR system should be considered as an experimental or demonstration project. For these reasons, DAQ properly determined that the use of SCR was technically infeasible, and this determination is firmly supported by EPA's evaluation conducted during the NSPS rulemaking.

b. DAQ properly evaluated control efficiencies for Selected Non-Catalytic Reduction (SNCR) technology

Opponents of the CCC project have also asserted that DAQ failed to evaluate properly the range of control efficiencies above 50% that an SNCR system may achieve. For example, SELC references a Portland cement plant in Seattle, WA, that “has achieved 80-90% efficiency from its SNCR,” and “two Swedish kilns achieving 80-85% NO_x removal efficiency.” See SELC Comments at 22. SELC further alleges that DAQ used a baseline for uncontrolled NO_x emissions in the evaluation that was too high (2.8 lbs/ton of clinker) compared to three other kilns that used baseline emission rates of 1.62 lbs/ton, 1.88 lbs/ton and 1.97 lbs/ton. See SELC Comments at 22-23. These comments are off the mark as well.

The efficiency of SNCR is site-specific and the results for the Seattle plant and the two Swedish plants are not comparable to CCC. For instance, the Seattle plant referenced is only 1/3 the capacity of CCC and burned only 10% of its fuel in the calciner (compared to 60% for CCC), and has a very different temperature profile and residence time than CCC. In addition, the Seattle plant did not have an alkali bypass that CCC will have (i.e., a portion of the exhaust stream that cannot be treated). Furthermore, as EPA points out in its analysis of the performance tests cited by SELC, the Seattle results were based on “limited short-term data” from a week long test where the results ranged from 27% to 90% NO_x removal. The EPA analysis cited by SELC also provides data on numerous other plants with SNCR with widely varying NO_x removal efficiencies, further demonstrating the site-specific nature of the effectiveness of SNCR.

For CCC, the installed location of SNCR injection points will be based on achieving the optimum temperature range and the presence of excess oxygen in the flue gases, and the specific ammonia injection rate will be adjusted after construction to optimize the control efficiency of the SNCR system, as much as possible, while limiting excess ammonia reactant that can increase the potential for visible ammonia slip. Higher injection rates of ammonia that may be evaluated to increase removal may not only increase ammonia slip, but may increase other permitted emissions, such as CO. Higher actual removal efficiencies may be achieved under various conditions, but they cannot be guaranteed or relied upon in setting pre-construction BACT limits.

Further, the baseline for CCC's NO_x is based on the calciner design and burnability of the fuel and mix components, which is highly site-specific. See Preliminary Determination at 107-108; CCC BACT Analysis at 42-43. The NO_x baseline (2.8 lbs/ton of clinker) used in

CCC's analysis is in the same range that EPA used in its model kiln for developing New Source Performance Standards. EPA estimated that "Though new kilns on average will have (NOx) emission of 2.5 lb/ton prior to the application of add-on controls, there may be situations where specific raw materials properties will result in higher NOx emissions. For this reason, [EPA] assumed a maximum baseline of 3.0 lb/ton and 50% emission reduction by SNCR to establish a 1.5 lb/ton control level." See "Summary of Environmental and Cost Impacts of Final Revisions to Portland Cement New Source Performance Standards," August 6, 2010, at 4. EPA also notes in the NSPS that this limit applies only to the main kiln exhaust gases and not the portion of exhaust that goes to a bypass, and for the same technical reasons, one would have to consider the effect of bypass gases in a BACT evaluation. Despite the SELC objections, the proposed BACT limit for NOx is lower than any recent known NOx BACT determination. BACT limits for NOx included in the RBLC database reviewed by DAQ were 1.95 lbs/ton of clinker to 2.85 lbs/ton of clinker range, while the BACT limit in the Draft Permit is dramatically lower at 1.4 lbs/ton of clinker.¹ See Preliminary Determination at 108, 116. Further, it must be noted that under the Draft Permit, the NOx emission rates for the CCC plant will be 80% lower than was typical for older wet plants such as the former Ideal Cement plant, and BACT for NOx will be nearly 18% lower than in the 2009 draft permit for the CCC project.

c. Fuel mixture impact on NOx emissions is highly variable

The final objection to the NOx analysis is the contention that DAQ only conducted a cursory review of NOx emissions from fuel, and that a greater use of pet coke instead of coal would further reduce NOx emissions. See SELC Comments at 19. However, such comments misapprehend the affect of fuel on NOx formation. The public comment regarding fuel mixture appears to be based upon an assumption that NOx emissions would be lower if pet coke, which has a higher heat or BTU value, were used instead of coal, because less fuel might be burned. However, NOx formation is a complex process that involves multiple variables, and the use of a fuel with a higher BTU value in the main kiln system of a Portland cement manufacturing facility may not always result in lower NOx emissions. Coke properties are source-specific and coke grinding influences the fuel particle size and, therefore, the burning characteristics in the calciner to a greater extent than coal. The higher burning temperatures that are possible using coke may produce more thermal NOx and thereby offset any reduction in NOx emissions achieved by reducing the amount of fuel burned. Further, as noted above, the baseline for CCC's NOx is based on the calciner and burner designs and burnability of the raw mix components, which is site-specific.

7. DAQ Properly Evaluated and Determined BACT for CO and VOCs

Public commenters also objected to the BACT analysis claiming that DAQ failed to identify the source of raw materials to be used, to determine the organic content of those materials, and to evaluate the control capability of activated carbon injection. See SELC Comments at 23-24. There is no merit to these assertions.

¹ CCC proposed a BACT limit for SO2 of 1.5 lbs/ton of clinker as discussed in its submittals to DAQ and as noted in CCC's comments dated October 31, 2011 on the Draft Permit and Preliminary Determination. CCC reserves all rights with relation to this BACT limit.

With respect to the raw material to be used, CCC provided emission estimates evaluated on the chemical and mineralogical characteristics of the site-specific raw materials that influence emissions and are representative of the quarry areas over which CCC has legal control. Additional analysis may be required in the event CCC proposes in the future to use raw materials from other areas of the quarry. Thus, any assertion that DAQ failed to evaluate the raw materials is incorrect. Further, to the extent SELC implies that DAQ should have considered off-site sources of raw materials, we note that consideration of such material substitution in a BACT analysis is essentially prohibited under the “redefining the source doctrine” discussed above.

In addition, SELC contends that DAQ should have analyzed the ability of activated carbon injection (ACI) systems to control VOCs. We are confused by this suggestion because the Draft Permit already requires CCC to install and operate a ACI system to control mercury, which will also control VOCs. EPA reviewed control options for CO/VOC emissions last year and determined:

We are not establishing limits for CO or volatile organic compound (VOC) emissions from cement kilns. VOC emissions from new cement kilns will mainly result from organics in the raw materials. Organic constituents in the raw materials can be driven off in the kiln preheater prior to reaching temperature zone that would result in combustion. All new cement kilns will be subject to a continuous 24 ppmvd THC emissions limit by the Portland Cement NESHAP previously discussed. Because most of the THC are also VOC, the THC limit also directly limits VOC, and serves as the baseline for the NSPS analysis. This limit is also the new source limit based on the best performing source. *Therefore we determined that no additional regulation of VOC emissions is necessary or feasible.*

As noted at proposal, the only control technology identified to reduce CO emissions is a RTO (which also would concurrently reduce any VOC emissions). However, we believe application of an RTO as BDT for CO would result in significant cost and adverse energy impacts. *Therefore, we determined that no additional regulation of CO emissions is feasible. We also noted that in no cases had add-on controls for CO (or VOC) been required as BACT under new source review.*

Final NSPS/NESHAP Rule, 75 Fed. Reg. 54970, 54996 (Sept. 9, 2010)(emphasis added).

As such, DAQ properly evaluated available control options for CO and VOC. The BACT analysis was properly conducted, and there is no merit to SELC’s contentions to the contrary.

8. DAQ properly evaluated greenhouse gases

DAQ conducted a proper evaluation of greenhouse gas emissions related to the proposed CCC facility. See Preliminary Determination at 116-123. The BACT analysis summarized in the Preliminary Determination identifies and evaluates eight potential control options, including their technical feasibility, cost and energy impacts, consistent with applicable EPA Guidance. Accordingly, there is no merit to SELC’s contention that DAQ failed to conduct a sufficiently probing analysis of available control options for greenhouse gas (GHG) emissions. See SELC Comments at 24.

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ATTACHMENT B

The Hearing Officer identified several issues raised by public comments regarding the air quality analysis prepared by CCC and evaluated by DAQ. Certain public comments question either the methodology of air quality modeling or the adequacy of such modeling. A brief response to each of the issues listed by the Hearing Officer follows. CCC is providing the discussion set forth herein to assist DAQ in reviewing and addressing or clarifying the issues raised by commenters regarding the air quality modeling analysis, as requested by the Hearing Officer. This information generally highlights information previously provided to DAQ by CCC, and references information published by EPA or DAQ, including the New Source Review Workshop Manual, 1990, (NSR Manual), North Carolina PSD Modeling Guidance (NC PSD Guidance), EPA Model Change Bulletin MCB#4 for AERMOD (dated 11059) (February 28, 2011), EPA Memorandum Re: Modeling Procedures for Demonstrating Compliance with PM_{2.5} NAAQS (March 23, 2010), and other public sources.

1. CCC Used a Proper Receptor Grid for Modeling

The Hearing Officer noted that certain commenters alleged that the receptor grid used in CCC's modeling analysis, including a 100 meter spacing of receptors at the fence line, may not adequately evaluate maximum impacts. SELC, for one, requests that DAQ require CCC to use a more refined receptor grid. See SELC Comments at 26. However, the grid spacing used in CCC's modeling analysis adequately identifies potential impacts and is consistent with modeling guidance provided in DAQ's NC PSD Guidance and EPA's NSR Manual. The NC PSD Guidance provides "receptor resolution may vary; however, receptors near the facility fence line and in the area of maximum impact must be no greater than 100 meters." This guidance regarding grid receptor resolution is also included in the April 1, 2011 and January 6, 2012 versions of the NC PSD Guidance, which were published subsequent to CCC's submission of the modeling. The EPA NSR Manual provides similar guidance, stating that 100 meter spacing represents "a relatively fine receptor grid." NSR Manual at C-40.

In this case, CCC used the receptor grid resolution recommended in guidance documents published by DAQ and EPA. In areas where maximum impacts were identified within a coarser receptor grid, CCC conducted additional modeling within a refined 100 meter grid to ensure that maximum modeled impacts were properly evaluated. With respect to short term runs for NO₂, the highest modeled concentrations were located approximately 15 km from CCC and not along the fence line receptors. DAQ reviewed and, based on its expertise, approved the modeling protocol in advance. The receptor grid was appropriate and proper.

2. CCC Used Proper Meteorology Data

The Hearing Officer also noted public comments questioning CCC's use of meteorology data in the air modeling. Specifically, SELC commented that "modeling is based on a combination of 1988-1992 meteorological inputs from Wilmington and Charleston," and asked DAQ to "explain and support why these inputs are representative for the facility." SELC Comments at 26. DAQ may respond by noting that the NC PSD Guidance requires permit

applicants conducting air quality modeling to use “five years of AQAB approved surface and upper air meteorological data,” and prefers the use of pre-approved AERMOD processed data sets, which are posted on the AQAB website, to site-specific data. NC PSD Guidance at 9. The NSR Manual similarly requires that the “[m]eteorological data used in air quality modeling must be spatially and climatologically (temporally) representative of the area of interest.” NSR Manual at C-39.

In this case, CCC obtained representative meteorological data sets from DENR in accordance with the guidance, and DAQ approved the data sets used in the modeling as appropriate for the CCC site. Additionally, the meteorological data sets used properly accounted for site characteristics based on current DAQ guidance by running AERSURFACE to select the proper DAQ pre-processed data set. The meteorology data used by CCC was proper.

3. The Air Modeling Used Proper Background Concentrations and SO₂ Emission Rate

Commenters also questioned the background concentrations used in the modeling analysis and the SO₂ emission rate used in the short-term significant impact level (SIL) analysis. The background concentrations used in the modeling were proper. As noted in the Preliminary Determination, “NAAQS modeling included off-site source emissions and background concentrations from inventories and data provided by DAQ.” Preliminary Determination at 81. DAQ provided the 2009 background concentrations to CCC for its use in the modeling analysis because it was the most current quality-assured data set available in the North Carolina DAQ monitoring network, particularly for NO₂ values. Further, the background concentrations provided by DAQ were derived from the Mecklenburg County monitoring station. New Hanover County is significantly less urbanized, so these values are more conservative, as more urbanized areas would yield much higher monitored background values.

Regarding the SO₂ emission rate used in the short-term SIL analysis, the emission rate is the maximum 1-hour SO₂ rate expected under worst-case operating conditions. Thus, both the background concentrations and SO₂ emission rate were appropriate for air modeling purposes.

4. NO_x Modeling was Proper

The Hearing Officer’s Report also notes the public comment, presumably from SELC, that “the most recent version of AERMOD includes significant changes and therefore the modeling should be revised.” Hearing Officer’s Report at 10. However, neither the Hearing Officer nor SELC further identifies the “significant changes” in the model or indicates how those changes could potentially affect the modeling conducted by CCC or would result in a materially different outcome. The modeling conducted by CCC followed the most current guidance and used the latest version of AERMOD at the time it was submitted to DAQ. Changes to AERMOD since the modeling submittal to DAQ are described in EPA Model Change Bulletin MCB#4 for AERMOD (dated 11059) (February 28, 2011) and relate to the use of the PVMRM with area sources and the use of the subroutine EMFACT. These options (area sources and emission factors) were not used as part of the modeling for NO₂ and, therefore, these changes would not alter or affect the modeled results. Thus, the changes to AERMOD do not impact modeling results for NO₂, and this comment, like the others, is unfounded.

5. PM-10 Modeling was Proper

The Hearing Officer also noted public comments that for PM-10 modeling, “the source contribution analysis is for one receptor, but it is not clear whether that was the only receptor with a modeled exceedance value.” Hearing Officer’s Report at 11. The source contribution analysis was performed for the highest modeled receptor after the refined grid modeling (hot-spot analysis) was conducted. The refined grid modeling yielded a total of five (5) potential exceedances. This refined grid run also included source groupings for CCC-only sources, which provides CCC’s contribution to each of these potential exceedances. The results of this modeling demonstrates that CCC’s contribution to each of the potential exceedances is well below the SIL values. This is illustrated by Table 7 in the modeling report. CCC provided, and DAQ reviewed, the full contribution modeling analysis. It should be noted that all off-site sources included in the modeling demonstrations for PM10 were based upon available PM data, which yields a more conservative emission rate for these offsite sources and in turn a more conservative modeling demonstration.

6. PM-2.5 Modeling was Proper

Despite acknowledging that “PM-2.5 modeling does not include off-site emissions sources because ‘off-site inventories and monitoring data are currently not available,’” certain public comments inexplicably contend that modeling should include off-site PM-2.5 data. See SELC Comments at 26. The PM-2.5 modeling analysis was proper and followed all applicable DAQ guidance. DAQ determined that off-site source modeling for PM-2.5 was not required for this demonstration based in part on EPA Memorandum Re: Modeling Procedures for Demonstrating Compliance with PM2.5 NAAQS (March 23, 2010), which recognized the lack of available inventory data. The EPA Memorandum also acknowledged that for PM-2.5 modeling, background monitored concentrations would provide better representation to the cumulative impacts due to the secondary formation of PM-2.5. This modeling was appropriate and proper.

7. Consideration of New Sources

Certain commenters appear to contend that the CCC models should be updated every time a new off-site source also seeks a permit, such as the Elementis Chromium site. Again, it must be recognized that CCC conducted all modeling in accordance with EPA guidance, DAQ guidance, and approved protocols using available inventory data. Sources permitted for both the Elementis Chromium and Invista facilities were evaluated and included within the off-site emissions at the time of CCC modeling submission. Based on DAQ and EPA guidance, PSD modeling would not include potential future sources from off-site facilities, as this is the responsibility of those facilities when they make application to permit proposed new sources. Furthermore, for those receptors where current modeling indicated that other sources may contribute to elevated concentrations, the CCC contributions to those modeled receptors were shown to not contribute significantly. Adding potential new or increased off-site emission sources would not affect CCC contributions at these modeled locations.

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