Illinois Environmental Protection Agency
Bureau of Air
March 2008

Responsiveness Summary for Public Comments and Questions on the Heat Recovery Coke Plant Project Proposed for United State Steel's Granite City Works in Granite City, Illinois

Application from Gateway Energy and Coke Company, LLC, c/o Sun Coke Company,
For a Heat Recovery Coke Plant adjacent to the Granite City Works
Application No.: 06070020, ID No.: 119040AAN

and

Application from United States Steel Corporation
For a Coke Conveyance System at the Granite City Works
Application No.: 06070088, ID No.: 119813AAI

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DECISION

On March 13, 2008, the Illinois Environmental Protection Agency (Illinois EPA) Bureau of Air issued a permit to Gateway Energy and Coke Company (Gateway) to construct a Heat Recovery Coke Plant adjacent to United States Steel Corporation's (US Steel's) Granite City Works in Granite City, Illinois. The Illinois EPA also issued a permit to US Steel to construct the associated Coke Conveyance System that would transfer coke from the proposed plant to the blast furnace facility at the Granite City Works. At the same time, the Illinois EPA issued this Responsiveness Summary to address questions and comments submitted to the Illinois EPA concerning the proposed issuance of permits for this project.

The issued permits include a number of additional requirements for the proposed project coke compared to the draft permits, as well as various clarifications to conditions, based on public comments. In particular, the issued permit for the proposed coke plant contains more stringent emission limits for emissions of particulate matter and additional requirements for emissions testing, monitoring and recordkeeping to verify compliance with applicable emission limits.

BACKGROUND

Gateway submitted an application to the Illinois EPA, Bureau of Air for construction of a heat recovery coke plant adjacent to US Steel's Granite City Works. The Granite City Works is an integrated iron and steel mill producing flat rolled steel products. The proposed plant would supply metallurgical coke to US Steel for use in the blast furnaces at the Granite City Works in which iron is produced. Metallurgical coke is produced by "cooking" coal in coke ovens. In the ovens, appropriate coal that is suitable for coking is heated at high temperature. This drives off volatile components in the coal, which are burned to provide heat for the coking process. The solid material that remains after the volatile matter is driven off is the coke, which contains primarily carbon, along with the ash or mineral matter originally present in the coal.

The proposed coke plant would have three batteries or banks of 40 ovens each, for a total of 120 ovens. The plant would be designed to process 1.1 million tons of coal per year, yielding approximately 740,000 tons of coke per year. Heat recovery steam generators (HRSGs) would recover the heat energy from the coke manufacturing process as high-pressure steam, which would be used to generate electricity. Other operations at the proposed plant would include coal and coke handling, storage, and processing.

In conjunction with this project, US Steel submitted an application to construct a conveyor system to transport coke from the Gateway plant to the blast furnace facility.

Another project is also currently planned by US Steel for the Granite City Works, i.e., the construction of a cogeneration boiler. That project is not the subject of this Responsiveness Summary. Comments submitted to the Illinois EPA on the draft permit prepared by the Illinois EPA for that project were addressed in a separate Responsiveness Summary, which the Illinois EPA released on January 30, 2008 when it issued a construction permit for the cogeneration boiler.

COMMENT PERIOD AND PUBLIC HEARING

The Illinois EPA, Bureau of Air evaluates applications for permits for proposed sources of emissions. An air pollution control permit application must appropriately address compliance with applicable air pollution control laws and regulations before a permit can be issued. Following its initial technical review of the applications from Gateway and US Steel, the Illinois EPA Bureau of Air made a preliminary determination that the applications met the standards for issuance of a construction permit and prepared draft permits for public review and comment.

US Steel and Gateway requested that the Illinois EPA hold a public hearing on the Coke Conveyance System and Heat Recovery Coke Plant project. The public comment period opened with the publication of a hearing notice in the Granite City Press Record Journal on September 23, 2007. The hearing notice was published again in the Granite City Press Record Journal on September 30 and October 7, 2007. The public hearing was held on November 8, 2007, at the Knights of Columbus Hall in Granite City. The purpose of this public hearing was to accept oral comments into the written hearing record and answer questions about the proposed project. The comment period was originally scheduled to close on December 8, 2007. In response to a request from several environmental organizations, the close of the comment period was extended until December 22, 2007.

AVAILABILITY OF DOCUMENTS

Copies of the construction permits for the Coke Conveyance System and the Heat Recovery Coke Plant issued to US Steel and Gateway, respectively, and this Responsiveness Summary are available by the following means:

1. From the Illinois Permit Database on the Internet:

   www.epa.gov/region5/air/permits/ilonline.htm
   (Find the documents under All Permit Records (sorted by name), Construction Permit Records).

2. By viewing documents at one of the following repositories:

Six Mile Regional Library District 2001 Delmar Avenue Granite City, IL 62040 618/452-6238	Illinois EPA Collinsville Regional Office 2009 Mall Street Collinsville, IL 62234 618/346-5120	Illinois EPA 1021 N. Grand Ave., East Springfield, IL 62794 217/782-7027

3. By contacting the Illinois EPA by telephone, facsimile or electronic mail:

   Illinois EPA
   Bradley Frost, Office of Community Relations Coordinator
   888/372-1996 Toll Free – Environmental Helpline
   217/782-7027 – Desk Line
   217/782-9143 – TDD
   217/524-5023 – Facsimile
   brad.frost@illinois.gov

APPEAL PROVISIONS

The construction permits being issued for the proposed project grant approval to construct pursuant to the federal rules for Prevention of Significant Deterioration of Air Quality (PSD), 40 CFR 52.21. Accordingly, individuals who submitted comments on the draft permits or participated in the public hearing may petition the United States Environmental Protection Agency (USEPA) to review the PSD provisions of the issued permits. In addition, any person who failed to file comments or failed to participate in the public hearing on the draft permit may petition for administrative review but only to the extent changes were made to the draft permit by the final permit decision.

As comments were submitted on the draft permits for the proposed project that requested a change in the permits, the issued permits do not become effective until after the period for filing of an appeal has passed. The procedures governing appeals are contained in the Code of Federal Regulations, "Appeal of RCRA, UIC and PSD permits," 40 CFR 124.19. If an appeal request will be submitted to USEPA by a means other than regular mail, refer to the Environmental Appeals Board website at www.epa.gov/eab/eabfaq.htm#3 for instructions. If an appeal will be sent by regular mail, it should be sent on a timely basis to the following address:

U.S. Environmental Protection Agency
Clerk of the Board, Environmental Appeals Board (MC 1103B)
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460-0001
Telephone: 202/233-0122

COMMENTS AND QUESTIONS WITH RESPONSES BY THE ILLINOIS EPA

1. How does the proposed coke plant differ from the existing coke plant at the Granite City Works?

The proposed plant would have heat recovery coking technology. The design and operation of heat recovery coke ovens, which are wide and relatively shallow, are different than that of traditional byproduct coke ovens, which are tall and narrow. A byproduct coke oven is designed and operated so that the volatiles and combustion products driven off the coal are collected downstream of the oven and processed in a "byproduct plant" to recover chemicals such as benzene, toluene, xylene, coal tar and ammonia. The combustible "coke oven gas" that remains after the byproducts plant is then returned to the coke ovens for use as fuel in the heating system in the brickwork of the ovens. More coke oven gas is produced than can be used in the ovens and the surplus is used in other combustion units at a source. Byproduct coke ovens must be kept at a positive pressure to prevent air from entering the ovens, which would oxidize recoverable products and overheat the ovens. In contrast, in a heat recovery coke oven, coal volatiles are oxidized or burned inside the oven and associated afterburner tunnels. The ovens are operated under negative pressure, adding air from the outside to oxidize volatile matter and enable combustion to occur in the oven system. As a consequence, byproduct coke ovens and heat recovery coke ovens have substantially different characteristics with respect to their emissions and the requirements for control of emissions.

2. The construction of the proposed coke plant is unwise given its emissions of particulate matter$_{2.5}$ ($PM_{2.5}$) and the current levels of $PM_{2.5}$ already in the air in Granite City. $PM_{2.5}$ is a pollutant with the potential for significant impacts on and damage to the health of the public.[1] The air quality in the Greater Metropolitan St. Louis Area does not currently comply with the applicable National Ambient Air Quality Standards (NAAQS) for $PM_{2.5}$ and the highest levels of $PM_{2.5}$ in the area are measured in Granite City, which is no coincidence given the magnitude of the emissions of $PM_{2.5}$ and $PM_{2.5}$ precursors from the Granite City Works.[2]

The Illinois EPA shares the concerns expressed by this comment about the current levels of $PM_{2.5}$ air quality in Granite City and the Greater St. Louis Area. However, current $PM_{2.5}$ air quality is being appropriately addressed by activities to lower emissions and come into compliance with the NAAQS for $PM_{2.5}$. These activities are separate from the permitting of the proposed project and must proceed irrespective of the proposed project to bring the area into attainment. In this regard, the health and well-being of the public is generally addressed by the process that starts when an area is designated nonattainment, which requires the State and/or USEPA to take needed measures to reduce emissions, improve air quality, and bring the area into attainment. This process includes a detailed evaluation of the role that different sources and categories of sources have in contributing to nonattainment status, so as to allow a comprehensive set of control measures to be developed that will prove both effective and feasible in achieving the ultimate result of attainment. This detailed evaluation is a critical step in the process, as the contribution of sources to nonattainment status may be affected by their location and influenced by specific sets of meteorological conditions, so that certain reductions in emissions are more effective in actually improving $PM_{2.5}$ air quality. For example, a key action to improve air quality both on a regional basis and throughout the eastern United States has been the adoption of the Clean Air Interstate Rule (CAIR) by USEPA. CAIR addresses the emissions of sulfur dioxide (SO_2) and nitrogen oxides (NO_x) from coal-fired power plants, as SO_2 and NO_x are precursors to the formation of $PM_{2.5}$ in the atmosphere and contribute to background levels of $PM_{2.5}$, most critically in urban areas.

This process to bring an area into attainment, which is triggered by an area being designated nonattainment, does not include a prohibition on the construction of new emission units in the area. The provisions of the federal

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[1] $PM_{2.5}$ is widely recognized as posing significant public health risks, including premature death from heart and lung disease and aggravation of heart and lung diseases, with associated hospital admissions, doctor and emergency room visits, medication use, and school and work absences. High levels of $PM_{2.5}$ in the air can also trigger asthma attacks. $PM_{2.5}$ air quality also possibly has a role in lung cancer, infant mortality, and developmental problems, such as low birth weight in children. Unlike total suspended particulate, which is very effectively filtered out of the air by the upper respiratory system, the small size of $PM_{2.5}$ lets it easily be inhaled deeply into the lungs where it can remain embedded for long periods of time before being absorbed into the bloodstream. Individuals particularly sensitive to fine particle exposure include older adults, people with heart and lung disease, and children. To address the potential impacts pf PM2.5 on public health, the USEPA in 2006 revised the short-term NAAQS for PM2.5, lowering it to 35 micrograms per cubic meter, annual average.

[2] In a November 2007 presentation explaining its recommendation to designate the Metro-East region nonattainment for the 24-hour $PM_{2.5}$ National Ambient Air Quality Standard (NAAQS), the Illinois EPA highlighted the Granite City Works as one of the top five sources of $PM_{2.5}$ emissions in the region, as well as one of the top few sources of each of the $PM_{2.5}$ precursors – nitrogen oxides, sulfur dioxide, volatile organic material, and ammonia.

Clean Air Act accommodate construction activity in a nonattainment area as economic activity is also important to the well-being of the public. Instead, additional requirements are imposed on major projects by the rules for Nonattainment New Source Review (NA NSR). These rules are designed to ensure that a proposed major project will not interfere with the ongoing work to bring the area into attainment.

3. The emissions of US Steel and other manufacturing facilities in Madison County disproportionately affect poor and minority populations who live nearby.

The presence of poor and minority populations in the area is another reason why the emissions of existing sources need to be reduced as quickly as reasonably practicable to improve air quality and bring the area into attainment with the NAAQS while also minimizing disruption to the local economy on which area residents also depend.

4. The draft permits would improperly and unlawfully address emissions of $PM_{2.5}$ from the project as if they were PM_{10}. The draft permits would not set any limits on the project's $PM_{2.5}$ emissions. They also would not address the offsets and LAER requirements applicable to a major project for a nonattainment pollutant in terms of emissions of $PM_{2.5}$. The draft permit for the coke plant would allow emissions of 267.77 tons per year of "$PM_{10}/PM_{2.5}$," without offering a breakdown as to how much PM_{10} and how much $PM_{2.5}$ will be emitted. The coke plant and conveyance system permits state that the coke plant project would be a major new stationary source of $PM_{2.5}$, subject to the Illinois nonattainment New Source Review ("NSR") regulations, 35 IAC Part 203, as well as a major new emitting facility with respect to PM_{10}, subject to the federal Prevention of Significant Deterioration (PSD) rules, 40 CFR 52.21.

   However, neither Gateway nor US Steel nor Illinois EPA actually applied the nonattainment NSR requirements to the project's $PM_{2.5}$ emissions. Rather, emissions of $PM_{2.5}$ were treated as if they were PM_{10}, and the requirements of NA NSR were applied to the project's PM_{10} emissions. Both permits justified that decision as follows: "For purposes of Nonattainment New Source Review… regulations, PM_{10} serves as a surrogate for $PM_{2.5}$, consistent with current USEPA guidance." None of the emission limits in either the coke plant or coke conveyance system draft permits applies to $PM_{2.5}$. The particulate limits are expressed either as "PM" or "PM_{10}." Illinois EPA's decision to use PM_{10} as a surrogate, rather than to craft $PM_{2.5}$-specific permit requirements, violates both federal and Illinois law. Gateway and US Steel should be required to re-submit their permit applications to address $PM_{2.5}$ emissions as $PM_{2.5}$, and to apply all nonattainment NSR requirements – including but not limited to offsets and LAER – to the project's $PM_{2.5}$ emissions.

The requirements of NA NSR for the proposed coke plant project for emissions of particulate matter[3] have been appropriately addressed. As explained in the

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[3] **Particulate matter emissions consist of particles of various sizes (generally less than 40 micrometers) that remain suspended in the atmosphere for an extended period of time. PM_{10} emissions consist of filterable and condensable particulate with an aerodynamic diameter of 10 micrometers or less. Particles greater than 2.5 micrometers (but less than 10 micrometers) within the PM_{10} fraction are considered the "coarse" fraction of PM_{10}. Particles with an aerodynamic diameter of 2.5 micrometers or less are considered the "fine" fraction of PM_{10} and are separately addressed as $PM_{2.5}$.**

Project Summaries accompanying the draft permits, for this purpose, emissions of PM_{10} were used as a surrogate for emissions of $PM_{2.5}$, for which the Greater Metropolitan St. Louis area is designated nonattainment. This approach is appropriate as it is consistent with formal USEPA guidance that is currently in effect. In particular, USEPA indicates that emissions of PM_{10} should be used for implementation of the NA NSR program until it completes rulemaking that sets forth how NA NSR should be implemented in terms of emissions of $PM_{2.5}$, which has not yet occurred. Using this approach, the proposed project is a major project subject to NA NSR for emissions of particulate matter.

5. The use of PM_{10} as a surrogate for $PM_{2.5}$ violates applicable law because the federal Clean Air Act imposes specific requirements on areas that are designated nonattainment for a pollutant. In this regard, since 1997, the USEPA has distinguished $PM_{2.5}$ from PM_{10}, with adoption of separate NAAQS for $PM_{2.5}$.[4] USEPA has made separate attainment and nonattainment designations for $PM_{2.5}$ and PM_{10}. Thus, Granite City is in an area that is attainment of the PM_{10} NAAQS but nonattainment for $PM_{2.5}$. Illinois's regulations follow this scheme.[5] However, the Illinois EPA prepared draft permits as if the region was both PSD and nonattainment for PM_{10}, and as if there was no separate NAAQS for $PM_{2.5}$. As a result, the draft permit for the coke plant did not satisfy the requirements of NA NSR for the proposed plant's emissions of $PM_{2.5}$. In particular, the draft permit for the proposed coke plant would authorize construction of a major new source of $PM_{2.5}$ emissions in a nonattainment area without offsetting reductions for its permitted emissions of $PM_{2.5}$ and without emission control requirements based on LAER for $PM_{2.5}$ emissions.

The Illinois EPA has appropriately addressed emissions of $PM_{2.5}$ in the permitting of the proposed coke plant project. The Illinois EPA did not assume that the project will emit only PM_{10} and ignore $PM_{2.5}$. $PM_{2.5}$ is a subset of PM_{10} and its consideration is inherent in a consideration of PM_{10}. The Illinois EPA required PM_{10} to be used as a surrogate for $PM_{2.5}$ in the determination of applicability of NA NSR for $PM_{2.5}$, which is both a reasonable and an acceptable approach at this time. In particular, there is not currently a NA NSR program for emissions of particulate matter in terms of $PM_{2.5}$. The Clean Air Act does not directly impose NA NSR requirements on proposed projects for emissions of $PM_{2.5}$ as suggested by this comment. Rather the Clean Air Act requires that states or USEPA adopt an implementation plan for a nonattainment area that includes a NA NSR program for emissions of nonattainment pollutant(s), which has not yet occurred for emissions of $PM_{2.5}$.

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[4] USEPA has stated that "The characteristics, sources, and potential health effects of larger or "coarse" fraction particles (from 2.5 to 10 micrometers in diameter) and smaller or "fine" particles (smaller than 2.5 micrometers in diameter) are very different." In the Final PM2.5 Implementation Rule, USEPA told states that because of the significant differences between PM10 and PM2.5, they would have to use different regulatory controls to protect air quality and public health. "In contrast to PM10, EPA anticipates that achieving the NAAQS for PM2.5 will generally require States to evaluate different sources for controls, to consider controls of one or more precursors in addition to direct PM emissions, and to adopt different control strategies." And as discussed more fully below, pollution control measures designed to capture PM10 emissions do not effectively control PM2.5 emissions.

[5] Illinois' regulations define "ambient air quality standard" as "those standards promulgated from time to time … by the United States Environmental Protection Agency (USEPA)…" 35 IAC 201.102. The construction or major modification in a nonattainment area of a source that is "… major for the pollutant for which the area is designated a nonattainment area…" without a permit is prohibited. 35 IAC 203.201. See also 35 IAC 203.207(a).

Moreover, the proposed project was determined to be a major project subject to NA NSR for emissions of particulate based on an evaluation of applicability in terms of the project's emissions of PM_{10}. Substantive requirements of NA NSR have been applied to the project for particulate. The construction permits issued for the coke plant project appropriately address the offset and LAER requirements of NA NSR for the project's particulate emissions, as well as appropriately addressing other requirements of NA NSR.

6. The Illinois EPA based its approach to the coke oven project's $PM_{2.5}$ emissions on "USEPA's interim guidance for implementation of Nonattainment New Source Review for $PM_{2.5}$."[6] However, Illinois EPA's reliance on this USEPA guidance for this project is misplaced because USEPA's recommended use of PM_{10} as a surrogate for $PM_{2.5}$ expired by its own terms when USEPA published the final $PM_{2.5}$ implementation rule in September 2007, before the draft permit was placed on public notice.

This comment misrepresents the current status of USEPA guidance for implementation of NSR for $PM_{2.5}$. While USEPA has completed certain portions of its implementation rulemaking for $PM_{2.5}$, which address certain matters related to emissions and air quality for $PM_{2.5}$, it has not yet completed the essential rulemaking for implementation of NSR for $PM_{2.5}$. The USEPA guidance memo ("Interim Implementation of New Source Review Requirements for $PM_{2.5}$," April 5, 2005) is a "memorandum to address how States should implement major NSR for $PM_{2.5}$ until we [USEPA] promulgate the $PM_{2.5}$ implementation rule." As of the date of issuance of this permit, the $PM_{2.5}$ implementation rule has not been completed in full. This was clearly stated by USEPA in the preamble to the rulemaking when it adopted part of the $PM_{2.5}$ implementation rule (Clean Air Fine Particle Implementation Rule; Final Rule, 72 FR 20586, April 25, 2007):

> **(Note that this rule does not include final $PM_{2.5}$ requirements for the new source review (NSR) program; the final NSR rule will be issued at a later date.) Page 20586**

This status was confirmed on September 21, 2007 in a subsequent rulemaking proposal by USEPA related to implementation of the $PM_{2.5}$ NAAQS, "40 CFR Parts 51 and 52 Prevention of Significant Deterioration (PSD) for Particulate Matter Less Than 2.5 Micrometers ($PM_{2.5}$)—Increments, Significant Impact Levels (SILs) and Significant Monitoring Concentration (SMC); Proposed Rule." In the preamble for this proposed rule, USEPA again states that:

> **The NSR part of the implementation rule is anticipated to be promulgated in September 2007. Additionally, once this proposed rulemaking is finalized, States will be able to fully implement a $PM_{2.5}$ NSR program. 72 FR 54116 (Sept. 21, 2007)**

In fact, the NSR part of the $PM_{2.5}$ implementation rule was not actually adopted in September 2007 as indicated in the proposed rule. Absent the NSR part of

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[6] In response to a request for the specific guidance upon which it was relying, the Illinois EPA provided four documents: (1) Memorandum by John S. Seitz, EPA, "Interim Implementation of New Source Review Requirements for $PM_{2.5}$" (Oct. 23, 1997) ("Seitz Memo"); (2) Memorandum by Stephen D. Page, "Implementation of New Source Review Requirements in $PM_{2.5}$ Nonattainment Areas" (Apr. 5, 2005) ("Page Memo"); (3) USEPA, Proposed Rule to Implement the Fine Particle National Ambient Air Quality Standards, 70 FR 66057 (Nov. 1, 2005) ("Proposed $PM_{2.5}$ Implementation Rule"); and (4) USEPA, Clear Air Fine Particle Implementation Rule, 72 FR 20586 (Apr. 25, 2007) ("Final $PM_{2.5}$ Implementation Rule").

the $PM_{2.5}$ implementation rule, Illinois EPA is neither required nor able to implement NA NSR for $PM_{2.5}$ except as it is made possible by the USEPA guidance to which this commenter takes objection in other comments.

7. USEPA's guidance recommending use of PM_{10} as a surrogate for $PM_{2.5}$ has expired. The Illinois EPA is improperly relying on outdated USEPA guidance documents as emissions of PM_{10} are used as a surrogate for emissions of $PM_{2.5}$ from the project, effectively "pretending" that all $PM_{2.5}$ emissions are PM_{10}. The 1997 Seitz memo only provided interim guidance for implementing the newly promulgated $PM_{2.5}$ NAAQS. It stated that sources could use PM_{10} as a surrogate for $PM_{2.5}$ in meeting NSR requirements until certain difficulties were resolved, primarily with respect to monitoring, emissions estimation, and modeling. This position was reaffirmed by USEPA specifically for NA NSR permitting in a 2005 memorandum by Stephen Page, Director of USEPA,[7] which noted that USEPA was recommending the use of PM_{10} as a surrogate for $PM_{2.5}$ "until we promulgate the $PM_{2.5}$ implementation rule." On November 1, 2005, USEPA published a proposed $PM_{2.5}$ implementation rule that made clear that use of PM_{10} as a surrogate for $PM_{2.5}$ would no longer be acceptable when the proposed rule was finalized.[8] In April 2007, USEPA published the final $PM_{2.5}$ implementation rule. Although the final rule stated that additional NSR guidance would be forthcoming, the rule clearly affirmed USEPA's rejection of the surrogacy approach as it discussed permitting under Title V of the Clean Air Act.[9]

USEPA's guidance recommending use of PM_{10} as a surrogate for $PM_{2.5}$ has not expired. The USEPA's statements in its April 2007 rulemaking with respect to Title V permitting are not relevant to implementation for NA NSR. Moreover,

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[7] Memorandum, April 5, 2005, Stephen Page, Director USEPA, "Implementation of New Source Review requirements in PM-2.5 Nonattainment Areas"

[8] "…The requirements applicable to NSR SIPs [State Implementation Plans] for and the obligation to subject sources to NSR permitting for $PM_{2.5}$ direct and precursor emissions are codified in the existing federal regulations, and can be implemented without specific regulatory changes. The existing regulations require NSR for any NAAQS pollutant for which an area is designated attainment or nonattainment. …For nonattainment areas, permits must comply with the nonattainment NSR requirements for $PM_{2.5}$, either in a State's approved part D program or, where that is lacking, as set forth in 40 CFR part 51, Appendix S, pursuant to § 52.24(k). …Once this $PM_{2.5}$ implementation rule is finalized, States will have the necessary tools to implement a major NSR program for $PM_{2.5}$ States will no longer be permitted to implement a nonattainment major NSR program for PM_{10} as a surrogate for the $PM_{2.5}$ nonattainment major NSR program…." 70 FR 66044, 66045 and 66058, November 1, 2005

[9] In discussing the implementation of permitting under Title V of the Clean Air Act, USEPA states, "In the preamble to the proposal, the USEPA stated that in the past some permitted entities have been using PM_{10} emissions as a surrogate for $PM_{2.5}$ emissions in permit applications, or in corrections or supplements to applications. The USEPA stated that upon promulgation of this rule, the USEPA will no longer accept the use of PM_{10} as a surrogate for $PM_{2.5}$.
Circumstances necessitating the quantification of $PM_{2.5}$ emissions and the submittal of this information include: (1) Determining all of the pollutants for which a source is major; (2) determining whether an applicable requirement or program applies, e.g., determining the applicability of a SIP requirement or a PSD or nonattainment NSR program, etc.; or (3) determining what fees a source owes a permitting authority as a result of considering $PM_{2.5}$ emissions. ….
In summary, the purpose of the statements made in the preamble to the proposal was to notify sources that as of the promulgation of this final rule, the EPA will no longer accept the use of PM_{10} emissions information as a surrogate for $PM_{2.5}$ emissions information given that both pollutants are regulated by a National Ambient Air Quality Standard and therefore are considered regulated air pollutants." 72 FR 20659 – 20060, April 25, 2007

even for Title V permitting, the USEPA indicates that the extent to which $PM_{2.5}$ emissions will need to be quantified in a Title V application will depend upon the circumstances of the application.[10] Because the NSR portion of the $PM_{2.5}$ rule has not been finalized, the Illinois EPA must continue to use Illinois nonattainment major NSR program for particulate matter, which addressed emissions of PM_{10}, as the means to address the requirements of NA NSR for emissions of $PM_{2.5}$. As also explained elsewhere in this Responsiveness Summary, the requirements of NA NSR were appropriately applied to the proposed project using emissions of PM_{10} as a surrogate for emissions of $PM_{2.5}$.

8. Illinois EPA's reliance on "USEPA interim guidance" in this case is misplaced because the technical difficulties upon which USEPA initially justified the use of PM_{10} as a surrogate for $PM_{2.5}$ have been resolved.[11] When USEPA published the Proposed $PM_{2.5}$ Implementation Rule in November 2005, it stated that the technical difficulties referenced in the Seitz Memo had been resolved or were addressed in the proposal rule.[12] Over the past decade since the "Seitz memo" was issued, concerns about measuring and modeling $PM_{2.5}$ have been largely resolved. $PM_{2.5}$ monitoring stations have been in operation for many years; measurement methods are in place; and adequate modeling techniques have been developed.

Since 1997, many of the technical difficulties posed for the implementation of the $PM_{2.5}$ NAAQS have been resolved, especially as related to ambient monitoring and development of computer models to prepare attainment demonstrations. However, certain critical technical issues for direct implementation of NA NSR in terms of emissions of $PM_{2.5}$ have not. While USEPA has provided guidance on testing of emissions of $PM_{2.5}$ with publication of a Conditional Test Method for emissions of $PM_{2.5}$, it has not completed rulemaking to adopt a Reference Test Method. This is an important step for authoritative emissions testing to be performed for a pollutant and is especially critical for $PM_{2.5}$ as a physical separation of collected particles based on their sizes must be made during testing. Lacking a Reference Method, one cannot be assured of consistent and reliable measurements among the tests that have been conducted, which have been conducted by different methods and which may not reflect the test methodology eventually adopted by USEPA. As stated elsewhere in this Responsiveness Summary, the permitting for the proposed project has appropriately addressed the potential applicability of NA NSR to this project for its emissions of

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[10] **With respect to Title V permit applications, USEPA also states, "The degree of quantification of $PM_{2.5}$ emissions required in an application (including an initial, modification or renewal application), or in a correction or supplement to an existing application, depends on the types of determinations that a permitting authority needs to address for a particular source, the requirements of title V, and the information needs and requirements of the particular State in question." 72 FR 20660, April 25, 2007.**

[11] In 1997, in the Seitz Memorandum in which USEPA recommended use of PM_{10} as a surrogate for $PM_{2.5}$, it explained that this interim approach was based on technical concerns. "In view of the significant technical difficulties that now exist with respect to $PM_{2.5}$ monitoring, emissions estimation, and modeling…, EPA believes that PM_{10} may properly be used as a surrogate for $PM_{2.5}$ in meeting NSR requirements until these difficulties are resolved." Seitz Memorandum, Paragraph 1.

[12] "The 1997 guidance stated that sources would be allowed to use implementation of a PM_{10} program as a surrogate for meeting $PM_{2.5}$ NSR requirements until certain difficulties were resolved, primarily the lack of necessary tools to calculate the emissions of $PM_{2.5}$ and related precursors, the lack of adequate modeling techniques to project ambient impacts, and the lack of $PM_{2.5}$ monitoring sites. As discussed in this preamble, those difficulties have been resolved in most respects, and where they have not been, the proposal contains appropriate provisions to account for it. These issues will be finally resolved by the Agency upon promulgation of these proposed revisions." 70 FR 65984. at 66043 (November 1, 2005).

particulate matter using PM_{10} as a surrogate of emissions of $PM_{2.5}$.

9. Gateway has effectively conceded that the technical difficulties noted by USEPA in its 1997 guidance regarding implementation of the NAAQS for $PM_{2.5}$ have been overcome. To support use of reductions in emissions of sulfur dioxide (SO_2), initially for netting and then for offsets, for the $PM_{2.5}$ emissions of the proposed plant, Gateway had computer modeling performed to evaluate the effect of reductions in SO_2 emissions on ambient concentrations of $PM_{2.5}$. In its application, Gateway reports data for PM_{10} and $PM_{2.5}$ concentrations at the ambient monitoring stations in Granite City. In its application, Gateway also provides separate emission calculations and emission data for PM_{10} and $PM_{2.5}$ emissions from various emission units.

These actions by Gateway do not demonstrate that the relevant issues for direct implementation of NA NSR in terms of $PM_{2.5}$ emissions have been overcome. The computer modeling that was performed for emissions of SO2 addressed conversion of SO_2 to "indirect" sulfate particulate in the atmosphere and is not relevant to the determination of "direct" emissions of $PM_{2.5}$ that have been and can be made for different types of units. The submittal of ambient air quality data for $PM_{2.5}$ that was collected at ambient monitoring stations operated by the Illinois EPA, which measure $PM_{2.5}$ in the atmosphere, also does not address technical issues that are present with measurement of emissions of $PM_{2.5}$.

At most, the only action by Gateway that potentially has any relevance to permitting of the proposed plant and implementation of NA NSR in terms of $PM_{2.5}$ is the submittal of $PM_{2.5}$ emissions data for the various units of the plant. However, closer review of the submitted data reveals that it does not show that the technical issues posed for permitting in terms of $PM_{2.5}$ have been resolved. That is, it does not show that there is credible data, with a sound technical basis, for emissions of the proposed plant in terms of $PM_{2.5}$. Among other things, the $PM_{2.5}$ emission data provided by Gateway for the main stack, which is the principal source of particulate at the plant, merely repeats the emission data provided for PM_{10}. Equally important, implementation of NA NSR in terms of $PM_{2.5}$ would require credible data for the $PM_{2.5}$ emissions of existing units. $PM_{2.5}$ data for units at existing coke plants would be essential for the determination of Lowest Achievable Emission Rate (LAER) for the new emission units at the proposed plant to be made in terms of $PM_{2.5}$. To reasonably implement the emission offset requirement of NA NSR in terms of $PM_{2.5}$, solid emission data in terms of $PM_{2.5}$ data would be needed for existing units at Granite City Works and other existing units in the area that could potentially provide the emissions offsets for the proposed plant.

10. US Steel has also shown by certain actions on its part that the technical difficulties noted by USEPA in 1997 with respect to $PM_{2.5}$ have been resolved. In particular, US Steel has submitted Annual Emissions Reports to Illinois EPA that present separate and distinctly different data for emissions for PM_{10} and $PM_{2.5}$.[13] The Illinois EPA also has sufficient information regarding $PM_{2.5}$ emissions to identify the region's highest-emitting sources and the extent of their emissions.

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[13] In the 2003 Annual Emission Report submitted to Illinois EPA, US Steel separately reported PM_{10} and $PM_{2.5}$ emissions from all point sources at the Granite City Works that combusted coke oven gas or blast furnace gas including Slab Furnaces 1 through 4, Boilers 1 through 12, and the existing blast furnace gas flare. For most emission points, US Steel used emission factors to calculate $PM_{2.5}$ emissions that were distinctly different from the PM_{10} emission factors.

The various actions and events identified in this comment, which are not directly related to applicability of NA NSR, do not show that it is inappropriate to use emission of PM_{10} as a surrogate for emissions of $PM_{2.5}$ for purposes of evaluating applicability of NA NSR and implementing the requirements of NA NSR. In particular, the fact that US Steel has provided $PM_{2.5}$ data in its annual emission report does not show that such data is of suitable quality for use in a permit application and permitting. A source may update an Annual Emission Report to reflect new information merely by submitting a revised report. By way of contrast, the emission information submitted by a source in a permit application routinely leads to the establishment of enforceable limits that reflect the information in the application. Those limits may only be changed by issuance of a revised permit by the Illinois EPA. In the event underlying data changes, the limits in a permit do not automatically change to reflect the new data and enforcement may be initiated for failure to comply with the established limits. Similarly, statements by Illinois EPA concerning the $PM_{2.5}$ emissions of different sources have no binding consequences and will change with time as more accurate data becomes available.

11. Experts in other cases involving permitting of proposed new source have demonstrated that the technical concerns noted by USEPA in 1997 regarding measuring, modeling, and defining appropriate pollution control for $PM_{2.5}$ emissions have been resolved.

The material accompanying this comment does not support the position taken in this comment that the technical issues with regard to permitting of emissions of $PM_{2.5}$ have been resolved. The submitted report of Hal Taylor in a proceeding concerning the proposed Highwood Generating Station near Great Falls, Montana merely claims that permitting for this proposed coal-fired utility boiler could have been conducted for particulate matter in terms of $PM_{2.5,}$ accompanied by general observations about applicable laws and the nature of emission control technology for particulate. It does not provide specific data for emissions of $PM_{2.5}$ from existing coal-fired generating units. It also does not provide any engineering analysis and detailed documentation, as one would reasonably expect from an individual claiming technical expertise in emission control systems, to support a specific $PM_{2.5}$ emission limit that should have been set for the proposed boiler.

Indeed, the circumstances of the proposed Highwood Generating Station are similar to those of the proposed coke plant. PM_{10} was used as a surrogate for $PM_{2.5}$ in the permitting of that proposed major source by the Montana Department of Environmental Quality. The emissions of sulfur dioxide (SO_2) and particulate matter from the proposed boiler, which will burn low-sulfur Western coal, will be controlled by a spray dryer absorber system followed by a fabric filter baghouse, like the main stack of the proposed coke plant. The permit issued in May of 2007 sets BACT limits for the particulate emission of the boiler that are similar to, if not distinctly higher than, the limits set as BACT for the main stack at the proposed plant.[14]

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[14] **The BACT limits for the proposed Highwood boiler are set in terms of pounds of pollutant per million Btu heat input (lb/mmBtu), as appropriate for a boiler. The particulate limits are 0.012 and 0.026 in lbs/mmBtu for filterable PM and total PM_{10} (combined filterable and particulate). Using an average of the standard F-factors from USEPA Method 19 for bituminous coal and lignite, 9,525 dscf per mmBtu, equivalent emission rates in gr/dscf would be 0.0088 and 0.019 for filterable PM and total PM_{10}, respectively. These equivalent rates, in gr/dscf, are similar to the BACT limits for the**

12. The Illinois EPA's reliance on "USEPA interim guidance" in this case is also misplaced because USEPA guidance cannot subvert the clear requirements of federal and state law and regulation, which establish $PM_{2.5}$ as a pollutant separate and distinct from PM_{10}, requiring specific permit requirements and emissions controls for $PM_{2.5}$. USEPA guidance memoranda are not regulations and do not have the force of law. They may not be relied on to avoid complying with statutes and regulations. As non-legislative rules that are not subject to notice and comment, guidance documents do not establish "binding norm[s]," are not "finally determinative of the issues or rights to which they are addressed" and may leave agency officials "free to exercise discretion to follow, or not to follow, the [announced] policy in an individual case." In recognition of this, the Seitz Memo states clearly that it does "not bind State and local governments and the public as a matter of law." As USEPA stated in the Final $PM_{2.5}$ Implementation Rule, "…the EPA will no longer accept the use of PM_{10} emissions information as a surrogate for $PM_{2.5}$ emissions information given that both pollutants are regulated by a National Ambient Air Quality Standard and therefore are considered regulated air pollutants." USEPA promulgated the $PM_{2.5}$ NAAQS by regulation in 1997. Neither Illinois EPA nor US Steel may justify ignoring the $PM_{2.5}$ NAAQS by reliance on informal USEPA guidance (even if it supported their position, which it does not at this time).

The Illinois EPA's reliance on USEPA guidance in this case is not misplaced. This comment does not demonstrate that the USEPA guidance is contradicted by the express terms of the Clean Air Act, other than to note that PM_{10} and $PM_{2.5}$ are considered different air pollutants under the statutory framework of the Clean Air Act. The Illinois EPA has appropriately addressed NA NSR for the emissions of particulate matter from both the proposed coke plant and associated coke conveyance system, which are being permitted as a major project subject to the requirements of NA NSR. For purposes of applying NA NSR to this project, emissions of PM_{10} have been used as a surrogate for emissions of $PM_{2.5}$ for certain purposes, e.g., setting LAER limits. As explained elsewhere in this Responsiveness Summary, this approach to the project is technically justified for a variety of reasons.

13. The convoluted permit application history since July 2006 raises troubling questions and makes meaningful public comments difficult. Simply understanding the chronology of Gateway and US Steel's permit applications is not a task for the faint of heart.[15] Of particular

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main stack at the proposed coke plant in the draft permit (0.008 and 0.015) and distinctly higher than the BACT limits in the issued permit (0.005 and 0.011).

[15] In July 2006, US Steel initially filed two applications, one for various projects to reduce emissions, including construction of a coke oven gas desulfurization system and one for a new cogeneration boiler and coke conveyor system. At the same time, Gateway Energy and Coke Company (Gateway) filed an application to construct a new heat recovery coke plant at the Granite City Works. In its applications, US Steel described the Gateway plant as "directly related" to its applications. US Steel also claimed that its proposed new emission units would net out entirely of NSR. Gateway claimed the coke plant that would net out of NSR for pollutants other particulate matter based on emission decreases at the Granite City Works.

In December 2006, US Steel revised its application, transferring four activities from the application for emission reduction projects to the cogeneration boiler application. US Steel continued to maintain that the coke plant was related to its cogeneration boiler project: "The three applications were submitted together because all the projects are related to the development of a heat-recovery coke oven battery and

concern is that in August 2007, US Steel submitted a replacement application for the cogeneration boiler project. This application showed that the boiler project was a separate project from Gateway's proposed coke oven plant and would net out entirely of NSR. Before this, both US Steel and the Illinois EPA had treated both projects as being parts of a single larger project that was major for emissions of particulate matter.[16] This suggests that the projects were restructured to minimize applicable emission control requirements, which is troubling for a source that already has a large impact on ambient air quality.

It is not uncommon for permit applications for netting projects to have several revisions or addenda. In this case, the formal separation of the cogeneration boiler project and the coke plant project did not occur until US Steel submitted necessary information to fully explain the absence of any significant functional or economic relationships between the two projects. In fact, given the lack of such information in the initial application, the Illinois EPA originally understood that both projects were part of a single larger project. It was not until later in the review of the projects that it became apparent to US Steel that the cogeneration boiler project and coke plant project were appropriately treated as separate projects, with relevant supporting information then supplied to the Illinois EPA by US Steel and Gateway. This realization by US Steel and its submittal of additional material was a direct result of the Illinois EPA's response to the initial application for the cogeneration boiler project, which did not treat the project as separate from the proposed coke plant because US Steel had not provided an application with relevant information to support the project being a separate project from the proposed coke plant.

The Illinois EPA was aware that this change in the definition of the projects could be confusing. This is why it was decided that US Steel should submit a complete, new application for the Coke Conveyance System in August 2007 rather than simply submit another addendum to the original application.

14. The Illinois EPA conducted separate public comments periods on the draft permit for the proposed cogeneration boiler project and the draft permits for the proposed coke plant project. Public hearings were held on successive, but different days. This was done to emphasize US Steel's August 2007 decision that the cogeneration boiler project was unrelated to the coke plant project. However, the permitting of Gateway's proposed coke plant would rely on emissions decreases at US Steel's Granite City

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associated cogeneration facility." Then, in January 2007, US Steel supplemented its application for the cogeneration boiler project with a LAER and BACT analysis for PM emission, stating that this analysis was submitted based on guidance from Illinois EPA staff.

In August 2007, the definition of the projects took another turn. US Steel submitted a replacement application, redefining the nature of the project. US Steel now asserted that its cogeneration boiler project was quite separate from the Gateway heat recovery coke oven project. US Steel again claimed that the cogeneration boiler project would net out entirely of NSR.

[16] It is noteworthy that in its January 2007 second addendum to the application, US Steel stated that because of the interrelationship between the proposed Gateway coke oven plant and the proposed cogeneration boiler project and emission reduction activities, the coke plant project's emissions were considered in its overall netting analysis. As a result, US Steel could not net out of PM_{10} and $PM_{2.5}$ emissions for the cogeneration boiler project and submitted a BACT and LAER analysis as required for a major projects for PM_{10} and $PM_{2.5}$. In July 2007, Illinois EPA provided US Steel a preliminary draft permit which reflected the cogeneration boiler project being major project for $PM_{2.5}$ emissions, subject to the requirements of NA NSR, including LAER.

Works to escape PSD and NA NSR, and US Steel would implement an ongoing road sweeping program to generate the emission offsets required under NA NSR for emissions of $PM_{2.5}$. Together with the convoluted history of the permit applications, this suggests that the projects were structured to minimize pollution control requirements, which would be troubling for a source that already has a large, adverse impact on air quality, as well as outstanding emission violations.

As this comment observes, separate public comment periods were held for the proposed cogeneration boiler project and the proposed coke plant project. This was done to emphasize the distinct and separate nature of these two projects. This was a reasonable course of action by the Illinois EPA. The cogeneration boiler project is a project that only involves US Steel. The proposed heat recovery coke plant involves both US Steel and Gateway.

The handling of the projects was not intended to obscure the nature of the proposed coke plant. As clearly explained, this proposed plant would be part of the future operation of the Granite City Works, as it would supply coke to the mill. The permitting of the plant is based on it being a project that is occurring at the Granite City Works. As such the permitting of the project reasonably relies upon emissions decreases that would be occurring at the Granite City Works. Gateway and US Steel are entitled to proceed in this manner by rules that govern permitting.

While the results may be different than what would have occurred if the proposed coke plant were a free-standing source, separate from US Steel, it does not mean that the results are worse for the environment. In particular, if the proposed coke plant were a separate source, US Steel would not need to install and operate a desulfurization system on its existing coke ovens. This new system will provide a decrease in SO_2 emissions that is far greater than the SO_2 emissions of the new coke plant. Moreover, irrespective of how the proposed coke plant is permitted, with the Granite City Works or on its own, US Steel will have to reduce its emissions so that in conjunction with emission reductions from other sources and sectors, air quality in Granite City complies with the NAAQS for $PM_{2.5}$.

15. The draft permit for the coke plant would not apply the requirements of PSD or NA NSR to emissions of pollutants other than PM_{10} and PM2.5.[17] This would be because of contemporaneous emissions decreases at US Steel's Granite City Works. In the Project Summary for the coke plant, this is justified because the proposed plant is considered "a support facility for US Steel's Granite City Works" but further explanation is not provided as to why this is the case or, more importantly, significant. The Project Summary also does not provide any discussion on the criteria that a company must satisfy for applicability of NSR to be determined relying upon another company's emission decreases.

    The approach to applicability of PSD and NA NSR in the draft permit for the proposed coke plant treats the plant as a modification of the existing Granite City Works, rather than as a separate source. A proposed modification may net out of NSR requirements if the net change in emissions, considering contemporaneous emission decreases at the

[17] Absent reliance on emissions decreases at the existing Granite City Works, the proposed coke plant would be a major new source subject to PSD for emissions of nitrogen oxides (NOx), carbon monoxide (CO), sulfur dioxide (SO_2), and sulfuric acid mist and to NA NSR for emissions of NOx.

> source, is below specified significance thresholds. However, Gateway may only use emission decreases from US Steel if both are considered to be the same source.[18] In this case, Gateway may not use US Steel's decreases because they are not "under the control of the same person" and therefore not part of the same source.[19]

The proposed coke plant would be under common control by US Steel, so as to satisfy this criteria for pollutant emitting activities at the plant to be considered part of a single source with the Granite City Works. While the NSR rules do not define common control, many USEPA determinations provide guidance on how this term should be applied. For example, in a Memorandum by Richard R. Long, Director Air and Radiation Program, USEPA, Region 8, October 1, 1999, USEPA generally explains that in addition to direct ownership, common control can be established by contracts or functional relationships.

> **…ownership of two entities by the same parent corporation or subsidiary of the parent corporation. EPA has also considered whether control has been established by a contractual arrangement giving one entity decision-making authority over the operations of a second entity. EPA also has looked for a contract for service relationship between two entities, in which one sells all of its product to the other under a single purchaser contract. Finally, EPA has considered whether there is a support or dependency relationship between the two entities, such that one would not exist 'but for' the other.**

In this case, common control will be established by a contract that will involve both decision-making authority and a service relationship between the two entities. A recent letter from SunCoke confirms that a contractual agreement will exist between US Steel and Gateway such that the entities are commonly controlled. As explained in this letter, the capacity of the proposed coke plant has been designed and will ultimately be developed based on coke tonnage requirements of US Steel. The quality of the coke provided to US Steel is determined based on requirements established by US Steel. The coal blends used in coke production will be determined by US Steel. In the event the coke quality does not meet those standards designated by US Steel, US Steel is entitled to pricing credits and additional remedies if Gateway fails to meet its obligations. Finally, with regard to operation, US Steel has audit rights over the proposed plant.

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[18] The PSD rules define a "stationary source" as "…any building, structure, facility, or installation which emits or may emit any a regulated NSR pollutant." (40 CFR 52.21(b)(5)). "Building, structure, facility, or installation" is defined as "…all of the pollutant-emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control) except the activities of any vessel. Pollutant-emitting activities shall be considered as part of the same industrial grouping if they belong to the same 'Major Group' (i.e., which have the same first two digit code) as described in the Standard Industrial Classification Manual, 1972, as amended by the 1977 Supplement (U.S. Government Printing Office stock numbers 4101-0066 and 003-005-00176-0, respectively)." (40 CFR 52.21(b)(6)). Similar definitions are found in the NA NSR rules.

[19] In order for the proposed coke plant to be considered a single source with the Granite City Works, three criteria must be met for the pollutant-emitting activities at the proposed plant: (1) They must belong to the same industrial grouping; (2) They must be located on one or more contiguous or adjacent properties; and (3) They must be under the control of the same person (or persons under common control)

In addition, the contract between US Steel and SunCoke would reflect a functional, support/dependency relationship. The proposed coke plant would support US Steel by providing it with all the coke produced by the plant. US Steel is obligated to accept all the coke regardless of any interruptions in operations at US Steel. In fact, the proposed plant would not be developed with the physical ability to supply coke to any other party, as the plant would lack the necessary facilities to send coke to another party, such as an area to stockpile coke, rail access, or additional land. Since the proposed coke plant would not be able to ship coke to other customers, the plant would be a wholly-dedicated support facility for US Steel. The coke product provided by Gateway would be integral to the operation of the Granite City Works, which currently has onsite coking capacity to make less than half of the coke that is used by this mill. Finally, the contract would provide for US Steel to sell the property upon which the proposed coke plant would be located to Gateway for the specific purpose of developing the plant. According to Gateway, such sale is "integral to the overall coke sales transaction," further evincing that the coke plant would not exist but for actions by US Steel.

Another USEPA determination, Memorandum, William A. Spratlin, Re: Single Source Determinations, September 18, 1995, addresses a situation in which one company would be constructing a new facility at an existing source that is operated by another company.

> Typically, companies don't just locate on another's property and do whatever they want. Such relationships are usually governed by contractual, lease, or other agreements that establish how the facilities interact with one another. Therefore, we presume that one company locating on another's land establishes a 'control' relationship.

This memorandum goes on to suggest a series of questions that should be asked if this presumption is to be overcome. Only if each question can be satisfactorily answered, should the new facility be considered a separate source, rather than a facility that is under the control of the existing source, or under common control by both companies. If the questions cannot be satisfactorily answered, the proposed new facility cannot be considered a separate source for permitting purposes. As applied to the proposed coke plant, the answers to three of these questions confirm that the proposed coke plant is appropriately considered under common control by both Gateway and US Steel, so that permitting for the plant should treat it as proposed modification to the existing Granite City Works.[20]

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[20] The Spratlin Memorandum poses a number of questions, each of which is followed by the answer that applies for the proposed coke plant:

Question: "Do the facilities share intermediates, products, byproducts, or other manufacturing equipment? Can the new source purchase raw materials from and sell products or byproducts to other customers? What are the contractual arrangements for providing goods and services?" Answer: In this case, US Steel will purchase all of Gateway's coke output coke, subject to certain quality requirements. US Steel will participate in the selection of raw material. Gateway would have no other customers nor would it have a means to load out coke other than by the coke conveyor leading directly to US Steel. As expected, a contractual agreement is pending between US Steel and Gateway.

Question: "Who accepts the responsibility for compliance with air quality control requirements? What about for violations of the requirements?" Answer: Because of the operational relationship between the proposed plant and the Granite City Works, US Steel could also be the subject of an enforcement action brought against Gateway for violations of applicable emission control requirements, depending on the nature of and reasons for those violations.

16. For the proposed coke plant project, neither the draft permit nor the accompanying project summary address the critical question whether the proposed plant would be under common control by US Steel. At the public hearing for US Steel's cogeneration boiler project, Illinois EPA indicated that it did not specifically investigate the subject of common control or seek any documentation from either Gateway or US Steel on this subject. Instead, the Illinois EPA "expected" that Gateway and US Steel would enter into a contractual relationship that would establish common control between them. This was based on experience with other projects in which one company would be building a new facility at an existing source to supply a feedstock for the existing source, such as hydrogen, or handle a byproduct from the source, such as slag. However, the construction permit for the proposed plant provides a singular opportunity, likely the only opportunity in the long life of the plant, to set stringent BACT and LAER limits and to evaluate and, where appropriate, further limit the impacts on air quality. Accordingly the Illinois EPA may not squander this opportunity without solid proof that the proposed coke plant is under common control by US Steel.

As discussed above, the Illinois EPA has investigated this subject and has confirmed that the proposed coke plant would be under common control with US Steel. Accordingly, Gateway is entitled to rely on emissions decreases at the Granite City Works in the permitting of the proposed plant.

17. There are good reasons in this case to conclude that the proposed coke plant is not under common control with US Steel. In particular, in its replacement application for the cogeneration boiler project submitted in August 2007, which sought to have the cogeneration boiler project permitted separately from the coke plant project, US Steel provided Illinois EPA with significant facts indicating that the coke plant project is not under common control by US Steel.[21] These facts show that the proposed coke plant is not under common control by US Steel.

The information cited by this comment does not demonstrate that the proposed coke plant is not under common control by US Steel. In fact, as explained in this comment, US Steel's purpose in submitting the cited information was to demonstrate that the cogeneration boiler project was a separate project from the coke plant project. The information was not submitted to answer nor does

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Question: "What is the dependency of one facility on the other? If one shuts down, what are the limitations on the other to pursue outside business interests?" Answer: If the Granite City Works would shut down, US Steel would still be required to accept the coke from the plant. In addition, Gateway would not have the necessary facilities to supply coke to other customers.

[21] In material submitted to the Illinois EPA in the application for the cogeneration boiler project, US Steel states "US Steel and Sunoco, Inc. are publicly held corporations. US Steel and Sunoco, Inc. are completely separate corporate entities and neither corporation can control or directly influence the financing decisions of the other. …
US Steel and Gateway (as well as related entities, Sun Coal & Coke Company, and Sunoco, Inc., i.e. Sun Entities) are completely separate corporate entities. Neither US Steel nor the Sun Entities hold a financial or ownership interest in the other.…
…[N]either the COGEN Project nor the Coke Oven Project is technically dependent on the other for its existence. Further, two completely different corporate owners will finance the projects separately. Finally, each project is economically independent of the other with regard to its on-going operations. Therefore, the COGEN Project and the Coke Oven Project should not be aggregated for the purposes of PSD permitting, but should instead be permitted separately."

it answer the question whether the coke plant project is under common control with US Steel, which is a different question. As applied to that question, the cited information merely demonstrates that US Steel does not have common control over the proposed coke plant by means of direct ownership. It does not show the proposed coke plant is not under common control by US Steel, as common control can be established by means other than ownership, e.g., by a contract and functional relationships.

18. One must conclude that the proposed coke plant is not under common control with US Steel, as the Project Summary for the coke plant also states that the coke produced by the proposed plant might be used by US Steel in Granite City and/or it might be "sold for use elsewhere."

This fact also does not demonstrate that the proposed coke plant is not under common control by US Steel. The relevant issue is whether the proposed plant can send its coke to an entity other than US Steel. The fact that US Steel can ship the coke to its other mills, as well as use the coke at the Granite City Works, does not alter the dependency of the proposed plant on US Steel. Indeed, it does the opposite as it confirms that US Steel will manage the coke output from the proposed plant.

19. One must also conclude that the proposed coke plant is not under common control with US Steel because US Steel states in its application that it "could continue to operate its Granite City Works without coke from the Gateway Coke Plant, as it can continue to purchase coke for its operations from current suppliers."

This fact also does not demonstrate that the proposed coke plant is not under common control by US Steel. In this case, common control is not established by the dependency of the Granite City Works on the proposed plant, but the dependency of the proposed plant on US Steel. In addition, US Steel's ability to "import" coke as needed by the Granite City Works does not show that it is advantageous for US Steel to continue this practice. Indeed, circumstances show that US Steel would like to increase the coke-making capacity of the Granite City Works, with the development of the proposed coke plant.

20. The Illinois EPA may not proceed on the current record to issue a construction permit for the coke plant that would let Gateway net out of NSR by relying on emissions decreases generated by US Steel. If Gateway or US Steel now provide documentation to demonstrate common control, then Illinois EPA must prepare a new draft permit for public comment.

Consistent with 40 CFR 124.17(b), the record has been supplemented to respond to concerns raised in comments about the relationship between Gateway and US Steel for the proposed plant. This was reasonable and appropriate to respond to those comments.

21. Based on the present record, US Steel and Gateway have not demonstrated a relationship of common control. To the contrary, they have provided Illinois EPA with sufficient basis to conclude that the requisite common control does not exist. Therefore, Illinois EPA may not allow Gateway to use US Steel-generated emission decreases to net out of NA NSR and PSD.

Based on the circumstances of the proposed coke plant and the documentation that has been provided, the proposed plant will be under common control by US Steel.

22. US Steel improperly calculated baseline actual emissions for the proposed project using data that does not reflect actual emissions from the units with emissions decreases. Both NA NSR and PSD evaluate whether a modification involves a "significant net emissions increase" by comparing "actual emissions" prior to the project with actual or potential emissions with the project. Both programs make clear that the pre-project "actual emissions" are to reflect the amount of pollutants that units in fact emitted during the pre-project or baseline, timeframe. However, without accurate baseline information, it is impossible to demonstrate that claimed decreases reflect actual decreases in emissions.

US Steel provided an acceptable determination in its application of the actual emissions of existing emission units. While emission data from continuous emission monitoring equipment or data from more recent stack tests on more of the subject units would certainly have been preferable, in practice, that level of data is only rarely available for a netting analysis. Available emission factors must routinely be used with appropriate operating data to determine actual emissions of existing units and this practice is clearly accommodated by the relevant rules.[22]

23. For Boilers 1 through 10, US Steel calculated baseline NO_x emissions using an emission factor based on a stack test conducted a number of years before the baseline period. A one-time stack test conducted before the baseline period cannot serve per se in lieu for actual emissions data during this period. Stack tests are conducted under "optimal" conditions and do not capture the variability inherent in the operation of combustion units from variability in fuel quality and combustion conditions.

The data from this stack test was appropriately used to establish a NO_x emission factor for burning of coke oven gas. This emission factor was then used with data on actual usage of coke oven gas during the baseline time period to calculate actual emissions associated with burning of coke oven gas during the baseline time period. The test was not used nor could it ever be used by itself to directly determine the actual emissions during the baseline time period. Notwithstanding possible variability in the operation of emission units and the nature of stack testing, this emission factor from testing of a representative emission unit burning coke oven gas generated at the Granite City Works, the source under review, is preferable to a generic emission factor for the determination of actual emissions.

24. US Steel's use of NO_x emission data from emissions testing conducted on Boiler 12 and Slab Furnace 4 calculate baseline emissions for Boilers 1 through 10 and Slab Furnaces 1 through 3 is questionable. The sizes and ages of the boilers are significantly different.[23] Second, the Emission

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[22] **Both NA NSR and PSD provide that "…Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored or combusted during the selected time period…." 35 IAC 203.104 and 40 CFR 52.21(b)(21)(ii) .**

[23] Boiler 12, with a rated heat input capacity of 225 mmBtu/hour, is a "large" boiler while Boilers 1 through 10, with rated heat input capacity of 60 mmBtu/hour each, are "small" boilers, which places the boilers in different emission categories with substantially different emission factors under USEPA's *Compilation of Air Pollutant Emissions Factors*, AP-42. Boiler 12 is also much newer than the boilers that are to be shut down, which date back to the 1920s. Slab Furnace 4 with a rated heat input capacity of 495 mmBtu per hour is larger than Slab Furnaces 1 through 3, which are each rated at 322 mmBtu per hour.

Reduction Credit Permit Application indicates that the baseline coke oven gas NO_x emission factor for the slab furnaces was calculated base on a natural gas stack test on Furnace 4 and two stack tests on Boiler 12 (natural gas and coke oven gas). The application also does not explain why test results from a boiler with a rated heat input capacity of 225 mmBtu per hour are representative of emissions from furnaces rated at 495 and 322 mmBtu per hour.

When determining actual emissions, preference is given to emission factors from stack tests as such factors are generally considered more reliable than generic emission factors. This principle is relevant here because fuel bound nitrogen contributes to the NO_x emissions from burning of coke oven gas, unlike natural gas and blast furnace gas for which fuel-bound nitrogen is not significant. Accordingly, US Steel used stack tests to develop a site-specific emission factor that is applicable for the coke oven gas that is produced from its existing coke oven battery. This factor was derived from stack tests on Boiler 12, which has its own stack and can burn both 100 percent natural gas and 100 percent coke oven gas, which the slab furnaces are unable to do. The resulting emission factor is reasonably applied to all units burning coke oven gas as it reflects the significant contribution of fuel bound NO_x to the NOx emissions from burning of coke oven gas.

25. For Boilers 1 through 10 for emissions of pollutants other than NO_x, (e.g., CO and VOM), US Steel calculated actual emissions using emissions factors from USEPA's *Compilation of Air Pollutant Emissions Factors*, AP-42, rather than historic emission data for the subject period. US Steel also used emission factors from AP-42 to calculate baseline emissions from the shutdown of the Coke Oven Gas Pump system. This also does not satisfy the requirement that baseline emissions be "actual." Further, AP-42 emission factors are industry wide averages; so that the actual emission rates from some units are lower and the actual rates from other higher. Thus, these factors cannot be used to determine actual emissions.

Unit-specific emission factors, developed from emission testing on the specific units, would be preferable to the use of generic emission factors from AP-42 or testing on similar units. However, lacking such better emission factors, as is the case here, generic emission factors from AP-42 may be used in the calculation of historic actual emissions of units during the baseline time period.

26. Gateway may not rely on US Steel's inaccurate baseline data to net out of NA NSR and PSD requirements. The Illinois EPA may not rely on US Steel's inaccurate baseline data to allow either US Steel or Gateway to net out of NA NSR and PSD requirements.

US Steel provided an acceptable determination in its application of the actual emissions of existing emission units. While emission data from continuous emission monitoring equipment or data from more recent stack tests on more of the subject units would certainly have been preferable, in practice, that level of data is only rarely available for a netting analysis. Available emission factors must routinely be used with appropriate operating data to determine actual emissions of existing units and this practice is clearly accommodated by the relevant rules.[24]

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[24] **Both NA NSR and PSD provide that "…Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed,**

27. In the netting analysis for the proposed coke plant, Gateway and US Steel improperly rely on certain decreases in NO_x emissions at the Granite City Works from the shutdown of Boilers 1 through 10 and the installation of low-NO_x burners at Slab Furnaces 1 through 4 that are not surplus. A significant portion of these emissions decreases cannot be used for netting because they must be made under state and federal regulations that require Reasonably Available Control Technology (RACT) for emissions of NOx.[25] In particular, Illinois EPA has drafted proposed NO_x RACT rules[26] that would require the decreases in NO_x emissions from these units that US Steel is claiming are "voluntary" or surplus reductions. Additionally, these emissions decreases are already counted to demonstrate reasonable further progress under Illinois' ozone State Implementation Plan. 35 IAC 203.208(c)(4) precludes the use for netting purposes of emissions decreases previously relied upon for demonstrating attainment or reasonable further progress in the nonattainment area affected by the decreases. For this purpose, the Illinois EPA has made a commitment to implement NO_x RACT in the St. Louis Metro-East Nonattainment Area. The various corrections to the netting analysis for NO_x emissions recommended by comments change the net change in NO_x emissions for the project from a net decrease of 681 tons/year to a net increase of 408 tons/year. Accordingly, the coke plant is a major project for NOx emissions under both NA NSR and PSD review. BACT and LAER for NOx from the coke ovens would be selective catalytic reduction (SCR) designed to achieve 90% NOx reduction.

The emissions decreases relied upon for the coke plant project are not required at the present time and accordingly are surplus. This is because, as the comment observes, there are currently no state or federal regulations that require these emissions decreases. As observed by the comment, the Illinois EPA has only drafted proposed NOx rules. The Illinois EPA is still receiving comments from certain stakeholders on its proposal. When the proposal is finalized, it will still have to be submitted to the Pollution Control Board for rulemaking. The Pollution Control Board is a governmental body separate from the Illinois EPA, that has the authority to adopt emission standards in Illinois. It has the responsibility to hear testimony from potentially affected sources and other interested parties and to adopt emissions limits that it determines will be technically feasible and economically reasonable to comply with based on the record of the rulemaking. There is not any certainty that the rules and emissions limits proposed by the Illinois EPA will be those adopted by the Pollution Control Board. Accordingly, the NO_x emissions decreases calculated by US Steel for the netting analysis are surplus and it is

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stored or combusted during the selected time period…." 35 IAC 203.104 and 40 CFR 52.21(b)(21)(ii).

[25] Because the St. Louis Metro-East area is designated a moderate nonattainment area for the 8-hour ozone NAAQS, effective June 15, 2004, Illinois is required to develop a State Implementation Plan for the area and implement certain requirements under the Clean Air Act, including implementation of Reasonably Available Control Technology (RACT) to control emissions of NO_x from major source, pursuant to Section 182(f) of the Clean Air Act. (The only exception to this requirement would be if the USEPA approves a NO_x RACT waiver for the Metro-East area, which has not occurred.) US Steel's Granite City Works are a major source of NO_x emissions, with reported NO_x emissions of 3910, 2315 and 3767 tons in 2002, 2003, and 2004, respectively.

[26] The Illinois EPA released a draft of its proposed NO_x RACT rules for public comment on July 30, 2007.

not appropriate to adjust those decreases as suggested by this comment.

In addition, assuming for purposes of argument that such unilateral action by the Illinois EPA would be sufficient to affect the status of emissions decreases, the Illinois EPA has not relied upon these decreases for attainment planning. In particular, the reductions required for the proposed coke plant were not included in the future year inventory in the draft 8-hour ozone attainment demonstration for the Metro-East Nonattainment Area.[27]

28. None of the NO_x emissions decreases from the Slab Furnaces is creditable because they are required by RACT and are not surplus. The netting analysis for the draft permit includes NO_x decreases of 427.94 tons from the installation of low-NO_x burners on Slab Furnaces 1 through 4 (Refer to Attachment 1). The draft NO_x RACT rule would apply to these four units. US Steel submitted detailed netting calculations for the slab furnaces. US Steel calculated baseline actual NO_x emissions to be 1152.03 tons per year. US Steel calculated future NO_x emissions of 724.09 tons per year which is established as an annual emissions limit in the emissions reduction credit permit (Permit 06070022). However, application of NO_x RACT would require lower future emissions from these units.[28] The NO_x limit for the furnaces in the draft of proposed NO_x RACT rules is 0.18 lb NO_x/mmBtu. Future NO_x emissions allowed with this RACT limit, calculated using the same method used by US Steel with a future total fuel usage of 7,169,150 mmBtu per year[29], would only be 645.22 tons per year, not 724.09 tons per year. Thus, none of the NO_x decreases claimed from the installation of low-NO_x burners on the slab furnaces is creditable.

While adoption of NO_x RACT rules could potentially affect the status of certain decreases in NOx emissions for netting, at this time, NO_x RACT rules have not been finalized. These emission decreases do not cease to be surplus because of the preparation of a draft regulatory proposal. While the slab furnaces are targeted for further control under the draft NO_x RACT rule proposal, Gateway and US Steel are entitled to rely upon these decreases because rules have not been finalized. In addition, these decreases have not been included in the future year emissions inventory.

29. Some of the NO_x emission decreases from the shutdown of Boilers 1 through 10 are not creditable for netting because the decreases are required by NO_x RACT. A proposed NO_x RACT rule, 35 IAC 217.164, would apply to these boilers requiring use of combustion tuning. The Illinois EPA assumed in its attainment demonstration modeling for the Metro-East ozone nonattainment area that combustion tuning would result in a 30 percent reduction in NO_x emissions. Accordingly, a NO_x emissions decrease of 278.89 tons per year from the shutdown of existing Boilers 1 through 10, based on the historic actual emissions of these boilers, cannot be relied as would occur in the draft permit. Instead, the emissions decrease from the shutdown of these boilers must be reduced by 30 percent, with only a decrease of 195.22 tons of NO_x from these boilers claimed as surplus and used for netting. This is because the netting analysis must discount the actual NOx emissions by this factor for implementation of this NO_x RACT

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[27] http://www.epa.state.il.us/air/sip/metro-east-8hr-attainment-demo-draft.pdf, **see page 27.**

[28] Proposed 35 IAC 217.244 would establish NO_x RACT limit for reheat furnaces with rated heat input capacity equal to or greater than 100 mmBtu per hour at 0.18 lb/mmBtu. All four slab furnaces are rated heat at greater than 100 mmBtu per hour, with Slab Furnaces 1 through 3 at 322 mmBtu each and Slab Furnace 4 at 495 mmBtu.

[29] 0.18 lb NO_x/mmBtu) x (7,169,150 mmBtu/year) x (1 ton/2000 lb) = 645.22 tons NO_x/year.

control measure.

As previously discussed, it would not be appropriate to proceed in the manner recommended by this comment, adjusting the amount of NOx emission decreases available for purposes of netting for the proposed coke plant.

30. The volatile organic material (VOM) emissions of the proposed coke plant likely exceed 40 ton/yr because the wrong metric has been used for VOM emissions. The definition of VOM[30] requires that the full, actual mass of VOM be accounted for when determining VOM emissions. This is confirmed in USEPA guidance.[31] The emission calculations relied upon to show that the proposed coke plant is not subject to NA NSR for VOM do not appear to be based on the full mass of VOM, but rather on only a portion of the VOM emissions, determined on an "as carbon basis." This is a concern because organic compounds also contain hydrogen and may also contain oxygen, sulfur, and other elements. When the weight of all of the elements in VOM compounds is considered, VOM emissions are higher than when reported on an as carbon basis, typically at least 20 percent higher. If the plant's VOM emissions have been determined as carbon, VOM emissions have been underestimated and likely exceed 40 tons/year so the plant is subject to NA NSR for emissions of VOM.[32]

The VOM emissions of the proposed plant must be less than 40 tons/year, with determinations of emissions properly made to consider the full mass of the VOM compounds. The issued permit does not provide for emissions of VOM to be determined "as carbon."

31. The VOM test method used for emission testing at the Haverhill plant would determine the basis for VOM emission data in the application. Gateway did not provide a copy of the test report so the test method is not known. If Method 25 or 25A was used and VOM emissions were reported as carbon or as propane, then VOM emissions were understated. I speculate that this testing likely used Method 25A, as the draft permit specifies use of this method for emissions testing. The Illinois EPA should obtain the emission test report, review the basis of Gateway's VOM emission calculations, revise the VOM emission limits as appropriate, and circulate a new draft permit for public review.

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[30] Volatile organic material, also known as volatile organic compounds, is defined by 35 IAC 211.7150.

[31] "For the purpose of major source or major modification determinations (), emissions must be calculated as the total mass of VOCs (an "as VOC" basis). Expressing VOCs emissions in any other way (e.g., as carbon) may underestimate the quantity of VOCs being emitted and thereby result in erroneous major source/modification determinations." Elsewhere, USEPA opines that "[w]ith regard to VOC's, emissions must be calculated on a total VOC mass basis ("as VOC basis"), not on the basis of a surrogate such as "mass as carbon" or "mass as propane"

[32] Gateway developed the VOM emissions data for the proposed plant from the results of emission testing at SunCoke's existing heat recovery coke plant in Haverhill, Ohio. This data was then used by the Illinois EPA to set the limits in the draft permit that would restrict potential emissions of VOM so that the coke plant would not be subject to NA NSR for VOM. However, compliance with these emission limits is determined using USEPA Method 25A, which measures VOM "as propane" or "as carbon." The draft permit would define VOM on an "as carbon" basis, which is inconsistent with a determination of the actual mass of VOM emissions. This means that under the draft permit, only the weight of carbon atoms in each organic compound would be counted as VOM. Given the 2.5 ton/yr margin from the 40 ton/yr significance threshold for VOM emissions, this correction would be more than enough to tip VOM emissions over the threshold, triggering NA NSR.

Gateway used the VOM test results from Haverhill in a conservative manner so that the specific value of emissions measured at Haverhill and how it was measured are not critical. In particular, after appropriate adjustment for the difference in the size of the Haverhill plant and the proposed plant, Gateway applied a factor of six to the actual VOM emissions measured in testing to calculate the maximum emission rate from the proposed plant. This factor is more than adequate to account for any understatement in the results of VOM testing that may be present due to the test method that was used or the form in which the results were expressed.[33, 34]

Moreover, if the Haverhill testing used propane as a calibration gas, as routinely occurs in emissions testing using Method 25A, the measured test results likely overstated the mass of VOM emissions. This is because most of the VOM emissions from a heat recovery coke plant are expected to be in the form of hydrocarbons like toluene,[35] which have lower hydrogen to carbon ratios than propane. Accordingly, if test results were expressed as propane, actual VOM emissions may have in fact been overstated by almost 10 percent.[36]

32. Even assuming that the correct VOM test method was used for testing at the Haverhill plant, compliance with the emission limits in the draft permit would not be demonstrated as the draft permit only requires testing using Method 25A based on "as carbon." In other words, if the permit limits (based on the net emission calculations) were indeed based on total carbon, then compliance cannot be determined by measuring VOM as carbon using Method 25A.

This comment correctly observes that the draft permit would have inappropriately suggested that the results of VOM testing would be expressed "as carbon." This phrase is not present in the issued permit. This does not affect the netting analysis for VOM emissions, given the conservative nature of the data provided by Gateway for the maximum VOM emissions of the plant, as is carried over into the emission limits for VOM set in the permit. Testing for VOM emissions must be conducted in a manner that accounts for the total mass of VOM in the emissions, including hydrogen and any other elements that are constituents of the particular VOM compounds in the exhaust stream, with the results of testing expressed in appropriate terms.

33. The permit for the coke plant must require that Method 18 be used for

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[33] **The VOM emissions from the main stack measured at the Haverhill plant, which has 100 ovens, were 0.7 lb/hr, for an equivalent emissions rate of 0.84 lb/hr for the proposed plant with 120 ovens. Consistent with the maximum VOM emission rate for the proposed plant provided in the application by Gateway, the VOM emission limit that has been set for the main stack at the proposed plant is 5.6 lb/hr. This is over six times the measured emission rate (0.84 lb/hr x 6.66 = 5.6 lb/hr).**

[34] **Gateway exercised similar conservativeness in predicting the maximum emissions of the proposed plant for other pollutants, as is reflected in the limits on the plant's emissions. For example, the NOx limit for the main stack of the plant is 125 lbs/hr, where testing at the Haverhill plant would indicate NOx emissions of only 107.4 lbs/hr.**

[35] **Based on AP-42, the organic compounds present in the highest concentrations in the VOM emissions would be toluene (C_7H_8), benzene (C_6H_6) and naphthalene ($C_{10}H_8$). USEPA's *Compilation of Air Pollutant Emission Factors*, AP-42, 07/2007, Table 12.2.20.**

[36] **Toluene has a "carbon-equivalent" formula and molecular weight of $CH_{1.14}$ and 13.14. The chemical formula of propane is C_3H_8, with a carbon-equivalent formula of $CH_{2.66}$ and molecular weight of 14.66. The molecular weight of carbon is 12.0. Accordingly, expressing VOM emissions as carbon could understate VOM emissions by about 9 percent (13.14 ÷ 12.0 = 1.095). However, expressing VOM emissions as propane could overstate VOM emissions by about 9 percent (14.66 ÷ 13.14 = 1.094).**

testing of VOM emissions, as it is the only VOM test method that measures total carbon.

For the proposed plant, VOM emissions are reasonably measured using Method 25A, provided that results are expressed in terms of an appropriate calibration gas or with an appropriate scaling factor, rather than "as carbon." While Method 18 generally has the capability to measure the amount of specific organic compounds that are present in many VOM emission streams, this should not be expected to be the case for the emission stream from the coke plant. This is because, based on the emissions testing conducted at Haverhill, the total concentration of VOM would be less than 5 ppm. The concentrations of individual VOM compounds would be below the levels at which Method 18 is appropriately applied. In contrast, Method 25A is reasonably used in these circumstances as it provides an aggregate measurement of VOM emissions.[37]

Incidentally, Method 18 does not measure "total VOM emissions." Within its technical limitations, as discussed above, Method 18 measures concentrations of individual organic compounds. As Method 18 measures the concentrations of individual compounds, the actual mass of those compounds can be fully accounted for. However, as the concentrations of many compounds are measured, the accuracy of the overall result is affected by the accuracy of the individual measurements. In addition, the accuracy of the result is affected by the complexity of the VOM emission stream and the number of organic compounds for which individual measurements can be conducted as a practical matter.

34. The permitted increase in VOM emissions, at 37.61 tons/yr, is just 2.39 tons/yr shy of the 40 tons/yr significance threshold. This is not an adequate margin to assure that the increase remains below 40 tons/yr, given that the draft permit would only require a single stack test, which is hardly adequate to assure compliance over the life of the plant.

Ongoing compliance with VOM emission limits will not be determined from a single emissions test. The provisions for testing in this construction permit only address the initial emission testing that will occur upon completion of construction of the plant. They do not address the periodic emission testing that will occur during the life of the plant. The operating permits for the plant, which would be issued under Illinois' Clean Air Act Permit Program (CAAPP) would establish the requirements for periodic testing, as well make other needed enhancements to the basic compliance procedures for the plant set forth by the construction permit.

In addition, upon further consideration in response to this comment, the issued permit requires an emission test for the main stack of the plant during the plant's second year of operation. This testing would to be conducted within about one year (15 months) of the initial emission testing. This testing would provide additional confirmation of compliance during the period before a CAAPP Permit is issued for the plant.

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[37] **The discussion of applicability in Method 18 indicates "This method applies to the analysis of approximately 90 percent of the total gaseous organics emitted from an industrial source. It does not include techniques to identify and measure trace amounts of organic compounds, such as those found in building air and fugitive emissions sources." Method 18, Section 1.1, 40 CFR 60, Appendix A.**
In contrast, the discussion of applicability for Method 25A indicates "This method applies to the measurement of total gaseous organic concentration of vapors consisting primarily of alkanes, alkenes, and/or arenes (aromatic hydrocarbons)." Method 25A, Section 1.1, 40 CFR 60, Appendix A.

35. The permitted VOM emissions of the plant are within about 6 percent of the significance threshold. This is within the range of accuracy of VOM test methods, which may measure VOM to only within +/- 30 percent. Thus, it is plausible that test results would indicate compliance, but the actual emissions could exceed the significant emission rate for VOM emissions.

The accuracy of VOM test methods, as addressed by this comment, is not an appropriate basis to alter the VOM netting analysis and the approach to the permitting of the project for VOM emissions. Emission test methods are and must routinely be relied upon as "absolute" determinations of emissions, notwithstanding the technical limitations of particular test methods.

The relevant issue is the level of emissions measured in a particular test and the margin of compliance with applicable limits, as related to the time interval until emissions testing should be repeated. If the compliance margin is small, only a short period of time should elapse until retesting, given the potential variability in operation of a unit and the possible inaccuracy in the measured results, as addressed by this comment. As such, it is in a source's interest not only to comply with applicable limits, but to comply with a reasonable margin such that there is high confidence in consistent and continuing compliance. Gateway implemented this principle when it developed the data for the maximum VOM emissions of the proposed plant. As previously discussed, Gateway conservatively applied the results for VOM testing for the main stack at the Haverhill plant to develop data for the maximum VOM emissions of the proposed plant that includes a substantial compliance margin. This margin is much greater than 30 percent, such that any variation in measured VOM emissions of the plant due to technical limitations in the accuracy of measurements should not affect the determination of compliance.

36. Isn't $PM_{2.5}$ usually generated as a fume from processes or combustion, rather than as dust from roadways or material handling?

$PM_{2.5}$ is a composite of several different species of particulate,[38] including so-called crustal materials, which include windblown soil, industrial process emissions, flyash from combustion, and sea salt. Reductions in emissions of road dust are not generally targeted as an approach to improving air quality for $PM_{2.5}$. However, reductions in emissions of road dust can be part of an attainment strategy in appropriate circumstances, e.g., other reductions in emissions are not sufficient to achieve attainment or are significantly more costly to implement or are less cost-effective.

37. The draft permits for the coke plant and coke conveyance system state that the project's permitted emissions of PM_{10} (267.77 tons per year in

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[38] **The proportion of different types of PM2.5 or "species" present in total PM2.5 varies both spatially, on a local and regional basis, and seasonally. As a general matter, the majority of PM2.5 in the atmosphere is secondary or indirect PM2.5, present as sulfate, nitrates, and carbon, which is formed in the atmosphere from emissions of precursor compounds including SO2, NOx and organic compounds. Given its origin, this secondary PM2.5 is present as part of the ubiquitous, regional background level of air quality and cannot be effectively addressed with local control measures. Primary or direct PM2.5 is emitted directly from sources and can be generated either by combustion processes (soot or fume), by mechanical processes (dust), and by chemical processes (condensable particulate). Emission control measures for direct PM2.5 can provide local improvements in air quality. However, the extent of any such improvements is limited as the most of the PM2.5 in the atmosphere is secondary PM2.5.**

the draft permit) will be offset by "additional road sweeping," which must provide 236.03 tons per year of offsets and reductions attributable to the Coke Oven Gas Desulfurization Project, which must provide 31.74 tons per year of offsets. This approach to offsets does not satisfy legal requirements for emissions of $PM_{2.5}$ and offers no reasonable hope of stabilizing $PM_{2.5}$ concentrations in the area.

US Steel and Gateway are being required to offset particulate emissions in accordance with existing USEPA guidance, as discussed elsewhere, and current requirements for offsets in nonattainment areas, as specified in the NA NSR rules, 35 IAC 203.302. As such, PM_{10} emissions of the proposed coke plant project are being offset with PM_{10} emissions. These companies are not required as part of the permitting of the proposed plant to "stabilize" $PM_{2.5}$ concentrations in the area. USEPA and the states of Illinois and Missouri are required to enact rules and programs for stationary and mobile sources as needed to bring the area in attainment of the $PM_{2.5}$ NAAQS. This activity has resulted in meaningful improvements in the air quality in Granite City and will be ongoing until attainment of the NAAQS is achieved. In addition, emission units at the existing Granite City Works will be targeted for additional emission reductions as necessary and appropriate to bring the area into attainment of the NAAQS. However, this activity is separate and distinct from the permitting of the proposed coke plant.

38. The purpose of the offset requirement is to accommodate economic growth in nonattainment areas. NA NSR allows construction of a major new source or major modification for a nonattainment pollutant, which could worsen nonattainment, only if there are other reductions in emissions of the nonattainment pollutant in the region, so that the region continues to make "reasonable further progress" toward attaining the NAAQS. In order to achieve these goals, emission offsets "must be of the same pollutant…" 35 IAC 203.303(b)(1). As discussed in other comments, PM_{10} and $PM_{2.5}$ are separate and distinguishable pollutants, governed by separate NAAQS because of their differences. Illinois EPA may not rely on USEPA's outdated guidance to ignore the plain requirements of Illinois' rules, which preclude the use of PM_{10} emission reductions as offsets for the coke plant project's $PM_{2.5}$ emissions. Further, a portion of the $PM_{2.5}$ emissions is offset with secondary $PM_{2.5}$ emissions formed that result from emissions of SO_2. SO_2 is not the same pollutant as $PM_{2.5}$, and the secondary particulate sulfate formed from SO_2 is not a defined pollutant. Thus, the proposed offsets are inherently invalid because they do not even purport to address $PM_{2.5}$, the nonattainment pollutant at issue.

As discussed above, the permitted particulate matter emissions of the project, in terms of PM_{10}, are being offset with reductions in emissions, determined in terms of PM_{10}. Because $PM_{2.5}$ is a subset of PM_{10}, the pollutants are not separate pollutants although they may be distinguishable. Illinois's NA NSR rules do not preclude performing the offset transaction for a proposed project in terms of PM_{10} emissions, with reductions in PM_{10} emissions used as offsets for the permitted PM_{10} emissions of a proposed project.

The offsets for this project do include a 31.74 ton decrease in PM_{10} emissions from the construction and operation of a new Coke Oven Gas Desulfurization facility. This facility will reduce direct particulate emissions by reducing sulfate and sulfuric acid emissions, which are components of condensable particulate. These reductions are not in the form of "secondary" particulate, which is indirectly formed from emissions of SO_2 in the atmosphere as addressed

in the comment. Finally, secondary sulfate particulate in the atmosphere is a defined pollutant as it contributes to air quality for both PM_{10} and $PM_{2.5}$.

39. US Steel estimated the amount of emission reductions by calculating the existing emission baseline using an equation from AP-42 for dust created by traffic on paved roads. This equation requires a number of inputs, including the dust or silt loading on the surface of the road. Silt loading is the mass of silt-sized (equal to or less than 75 microns in diameter) particles per unit area of the traveled surface. US Steel measured the silt loading before and after sweeping on 10 or fewer of the 15 road segments in three rounds of sampling in July and August of 2007. As explained in more detail below, this methodology is one reason that Illinois EPA will be unable to determine whether road sweeping is producing real and quantifiable offsets. This is because emission reductions can only be counted towards offsets if they are real and quantifiable, "The baseline for determining the extent to which emission reductions are creditable as offsets shall be the actual emissions of the source from which the offset is to be obtained…"[39]

Based on the information in the USEPA's technical report "Control of Open Fugitive Dust Sources"[40], vacuum sweepers can be an effective method of removing silt from roadways. Other studies have confirmed the information in this USEPA technical report and shown road cleaning to have varying degrees of effectiveness.[41] Based on these studies, a well designed road cleaning program results in a real reduction in emissions from paved roads. US Steel, as required by the Illinois EPA, undertook a program or study to evaluate the effectiveness of the proposed road cleaning program on reducing silt loadings on roadways.[42] This study shows that the proposed road cleaning program will result in a definitive reduction in PM_{10} fugitive emissions from roadways around the Granite City Works.

The information in the testing program for silt loadings on roadways provided by US Steel, reasonably quantifies emission reductions as described in this comment's citation because the methodology used is an established estimation method from USEPA's *Compilation of Air Pollutant Emission Factors*, AP-42 Section 13.2.1. As further evidence that this methodology is an acceptable for quantifying emission reductions to be used for emissions offsets, USEPA recently approved a change to the PM_{10} State Implementation Plan for Maricopa County, Arizona that allows offsets to be generated through the paving of

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[39] USEPA has further elaborated on these requirements for emissions offsets. "Emission reductions must be quantifiable both in terms of estimating the amount of the reduction and characterizing that reduction for future use. Quantification may be based on emission factors, stack tests, monitored values, operating rates and averaging times, process or production inputs, modeling, or other reasonable measurement practices. The same method of calculating emissions should generally be used to quantify emission levels both before and after the reduction."

[40] **USEPA, "Control of Open Fugitive Dust Sources, (EPA-450/3-88-008)", (September 1988) Tables 2-4 & 2-5, & Page 2-22.**

[41] **Commenter's Exhibit 34, Yu-Min Chang et al., Effectiveness of Street Sweeping and Washing for Controlling Ambient TSP. Atmospheric Environment. V. 39. at 1894(2005).**

[42] **The silt loading data was used to calculate the emission baseline and the reduction in PM10 emissions from cleaning heavily traveled roads twice weekly (42.4%) and less heavily traveled roads twice monthly (55.9%). These control efficiencies were then used to calculate controlled silt loadings, which were used to calculate PM10 controlled emissions. The difference between the baseline emissions and the controlled emissions yields the emission reductions.**

unpaved roads.[43] That SIP revision requires that fugitive dust emissions from paved roads be calculated using the equation in AP-42 Section 13.2.1.

40. In light of the results of numerous studies, road sweeping simply cannot produce real and quantifiable reductions in emissions of $PM_{2.5}$. Road dust originates from many sources, including water and wind erosion from adjacent exposed areas, brake and tire dust, pavement wear, truck spills, winter sanding and salting, atmospheric fallout, and loose materials along the shoulders of the road which is entrained by mechanical turbulence created by the vehicles. The latter has a significant contribution to emissions and is not controlled effectively by sweeping and watering because it is continuously replenished by the vacuuming effect of traffic. Entrained road dust is always present, irrespective of whether sweeping and watering are used. US Steel did not present any actual test data or studies that demonstrate that sweeping would in fact reduce $PM_{2.5}$ emissions. Research by others suggests that road sweeping does not reduce $PM_{2.5}$ emissions or result in positive air quality benefits.

While some road dust and road dust emissions will still be present with the required road cleaning program, numerous studies (including those cited in this comment) show that road dust can be reduced using a road cleaning program. It follows therefore that a well-designed road cleaning program will have the affect of reducing road dust emissions including PM_{10} and $PM_{2.5}$ emissions.

Based on a review of these studies and the underlying sampling data, most if not all of these studies show road cleaning can be effective at reducing silt loadings on roadways and thus, their emissions of particulate. It is of note that one study cited by the commenter, includes a review of five other studies which identify street sweeping and vacuum sweeping as effective methods of reducing particulate matter emissions from roadways.[44,45]

Although the origin of road dust is significant when dealing with measures designed to prevent the generation of dust that accumulates on roadways, it is not relevant to the analysis of the effectiveness of removing road dust by a road cleaning program. The comment that loose material along the shoulders of the road is a significant source of fugitive road dust is not supported and does not appear to be supported by site-specific data. Many of the Granite City streets are curbed or have paved shoulders, which should minimize dust entrainment from the shoulders of the roads. Furthermore, US Steel's testing program took into account the affect of silt deposition by measuring silt levels over time enabling the calculation of silt deposition rates. This silt deposition rate was taken into account during the design of the road cleaning program to ensure the road cleaning program would have the desired effect of reducing PM_{10} emissions from roads.

41. The University of California, Riverside (UCR) conducted a study for the South Coast Air Quality Management District on the effectiveness of

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[43] ***USEPA Region IX Air Division, Technical Support Document for EPA's Rulemaking for the Arizona State Implementation Plan Regarding Maricopa County Air Quality Department Rule 242, "Emission Offsets Generated by the Voluntary Paving of Unpaved Roads,"*** **USEPA Rulemaking Document EPA-R09-OAR-2007-0610-0005 (July 19, 2007))**

[44] **Commenter's Exhibit 34, Yu-Min Chang et al., "Effectiveness of Street Sweeping and Washing for Controlling Ambient TSP," *Atmospheric Environment*. Vol. 39, p.1894 (2005).**

[45] **Studies cited are Ellis and Reavitt, (1982), Duncan et. Al. (1985), Cowherd, (1988), Fitz, (1998), Fitz and Bumiller (2000).**

street sweeping for control of PM_{10} emissions.[46] The study's authors concluded, "Based on our measurements, we do not recommend the use of street sweeping to control PM_{10} emissions from paved roads." The measurements of silt loading made by the study, similar to the approach used by US Steel, indicated that sweeping did not make a difference except for (1) the first time on a street which was not routinely swept and (2) on less-traveled local roadways. Silt loading measurements also indicated that deposition on active traffic lanes may be in equilibrium due to the vacuuming effect of traffic. US Steel selected the roads for inclusion in the sweeping program in part because of moderate to high traffic counts. In light of the UC study, the road sweeping proposed here would not bring about any additional emission reductions. In fact, the UC study results are consistent with the US Steel study, discussed below, which involved first-time sweeping, high traffic roads, declining silt content over time, and higher post-sweeping than pre-sweeping silt content. However, US Steel threw out what it believed to be aberrant samples and analyzed the data to side step these factors.

This comment overstates the value of the cited study by the University of California, Riverside (UCR), and its results and conclusions, as applied to the circumstances in Granite City. Although the UCR study did not recommend street sweeping as a measure to control PM emissions, based on its measurements, the study went on to say, "…(f)uture efforts to quantify the benefits of sweeping should be based on more extensive measurements of silt loadings on active traffic lanes in order to reduce the uncertainty." Because US Steel measured silt loadings in active traffic lanes, it is consistent with the recommendations of the UCR study to quantify the benefits of road cleaning.

In addition, the US Steel study was based on roads with different traffic characteristics than the streets addressed by the UCR study, for which little benefit was identified from sweeping. The UCR study involved streets with significantly different traffic volumes than the roads in Granite City that would be cleaned to provide emission offsets. The UCR study indicated that sampling was conducted on roads with low, moderate and high traffic counts as identified in the comment. However, the study defined moderate to high traffic counts at a level much higher than any street in the US Steel study. The information collected from two of the three streets in the UCR study reflected average daily traffic counts greater than 24,000 vehicles per day, even though Canyon Road was identified as a collector road (moderate traffic) and Riverside as an arterial (high traffic). The roads in the US Steel study have traffic counts ranging from 1,200 to 20,600 vehicles per day. Most are less than 12,400 vehicles per day, with three segments ranging from 13,200 to 20,600.

A review of the UCR study indicates that measurements were near the uncertainty levels of the methods and this was a limiting factor in the study's ability to draw conclusions on the effectiveness of street sweeping. The study was also conducted in an area where silt levels were a factor of 10 to 100 lower than the current silt levels measured by US Steel on major roadways in Granite City.[47] At the lower silt levels identified in the UCR study, street sweeping may not be an effective method of particulate reduction, however, at the higher

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[46] Control effectiveness was evaluated using upwind-downwind PM10 measurements and by determining silt loadings from active traffic lanes before and after sweeping. Three streets – one arterial, one connector, and one local – were evaluated over three seasons: fall, spring and summer.

[47] **Silt measurements in the University of California study ranged from 009 to 0.20 g/m2 whereas silt measurements in Granite City ranged from 2.10 to 35 g/m2.**

silt levels identified on the Granite City streets, vacuum cleaning of city streets has been shown to have a measurable affect by the US Steel study.

The UCR study data showed that silt loadings on roadways and road shoulders were reduced by vacuum sweeping based on the sampling of silt loadings performed in that study even at much lower levels of silt than have been measured on roads in Granite City. The upwind-downwind ambient sampling performed for the study, however, could not be used to draw any conclusions with regard to the effectiveness of vacuum sweeping because of measurement uncertainty. Indeed, in several of the data sets used for the upwind-downwind analysis, measured PM_{10} concentrations at the downwind monitor were lower than at the upwind monitor. This would erroneously indicate that the roads were acting to remove PM_{10} from the atmosphere. The study did not discuss this obviously aberrant data except to note that "the uncertainty of these differences in PM_{10}, as indicated by the standard deviation of the measurements at all three sites, is equal to or higher than the quantity measured."[48]

Another deficiency in the methodology in the UCR study was the extent of time between vacuum sweeping and post-sweeping sampling. Post-sweeping sampling was timed to immediately precede the next scheduled vacuum sweeping of each street. As a consequence, post-sweeping sampling was conducted from 2 to 19 days after initial vacuum sweeping. The study did not account for the affect that these large and variable intervals had on measurements or their potential role in contributing to the study's inability to confirm reductions in emissions with ambient monitoring conducted on the upwind and downwind sides of the studied streets.

Because of the limitations of the study identified above and the lack of a correlation between silt loadings for the UCR studied streets and the silt loadings for the Granite City streets, the UCR study has limited relevance to the circumstances in Granite City and does not discredit the road cleaning program that will be used to provide emission offsets for the proposed coke plant.

42. Numerous other published investigations have reached similar conclusions about the ineffectiveness of road sweeping to reduce PM_{10} emissions. Washington State University researchers concluded that "street sweeping has little effect on PM_{10} emission reduction when the relative humidity is higher than approximately 30%." Kuhns et al. concluded that street sweeping with mechanical and vacuum sweepers offered no measurable reduction in PM_{10} emission potentials. Another study concluded: "Inhalable particulates (PM_{10}) – upwind/downwind analysis...showed that frequent applications of a combination of vacuuming/ sweeping and flushing led to a reduction in PM_{10} contributions in the immediate vicinity of the roadway. Infrequent sweeping or vacuuming alone actually increased PM_{10} coming from the road… there was no clear evidence that the street cleaning program had a measurable impact on overall concentrations within the wider study area."

It is acknowledged that weather conditions, specifically precipitation, affect emissions of road dust. However, this effect is taken into account using USEPA's established methodology. The correlation between relative humidity and PM_{10} emission rates observed in a study by Kantamaneni and others (Kantamaneni

[48] Commenter's Exhibit 29, Denns R. Fitz, University of California, Riverside, *Evaluation of Street Sweeping as a PM10 Control Method. Final Report*. Prepared for the South Coast Air Quality Management District, at 2 (Jan. 29, 1998).

study) has not been observed elsewhere, as acknowledged in this study and therefore little weight is given to this observation. Although the Kantamaneni study could not identify any effect from street sweeping, this conclusion was based on one sweep of one high volume road (greater than 1,000 vehicles per hour).

A study by Kuhns and others (Kuhns study) used a vehicle mounted PM_{10} measurement system to monitor PM_{10} both before and after the tires on the test vehicle. The Kuhns study did not find any measurable reduction in PM_{10} potential due to road sweeping but also concluded, "At present, it may be premature to conclude that street sweeping has no effect on the urban scale PM_{10} emission inventory. Little is known about the evolution of particle size distributions on the road surface as car and truck tires come in contact with the surface loading material. If street sweeping can remove particles that may evolve into PM_{10}, then sweeping may have a beneficial effect on air quality over the long term. Thus, it is possible that the removal of comparatively large grains of geologic material reduces the total amount of PM_{10} that would otherwise be available for emission in the long-term." Nothing is known about the silt loading conditions of the roads in the Kuhns study.

The study by Dobroff, as included with this comment, did not include underlying data and therefore a review of that data could not be undertaken. A review of the conclusions of the Dobroff study shows that the PM_{10} measurements in that study indicated that the "final cleaning cycle appeared to have a positive impact of reducing downwind PM_{10} in the immediate vicinity of the road by 2 or 3 $\mu g/m^3$." This study was conducted in the vicinity of an integrated steel mill in Canada and may more closely address the conditions in Granite City. The study looked at ambient particulate matter data and conducted a limited upwind-downwind study but did not measure silt loadings on streets. The study found that a significant reduction in PM_{10} concentrations occurred with frequent road cleaning.

Reviews of the Kantamaneni and the Kuhns studies cited in this comment show that the conclusions cited by this comment are more speculative in nature, as the studies suffered from significant limitations. The Dobroff study appears to best address the conditions at the Granite City site (both sites are close to steel mills). The Dobroff study also appears to directly contradict the assertion made by this comment that road sweeping is ineffective at reducing PM_{10} emissions.

43. A recent comprehensive study of road dust control, which was authored by Chang and others (Chang study), found that the impact of road sweeping on ambient total suspended particulate matter concentrations was short-lived, lasting no more than 3 to 4 hours. However, the use of a vacuum sweeper designed to remove fine particulate matter coupled with a washer could reduce silt loading by up to 30 percent if applied aggressively. A sweeper alone did not reduce silt loading. As discussed below, reductions in silt loading do not translate into reductions in emissions.

This comment mischaracterizes the results of the Chang study and dismisses its conclusion that confirms what the US Steel study shows. The Chang study did not assert that the use of a sweeper alone did not reduce silt loading as stated in the comment. The Chang study confirms that a road cleaning program can effectively remove silt from roadways and lower emissions of particulate matter when designed correctly. In addition, the Chang study identifies several other studies which confirm that a road cleaning program can reduce

silt loading on roads and thereby lower PM and PM_{10} emissions and ambient levels of these pollutants in the area of the roads being cleaned.

The Chang study did not address the use of a sweeper alone.[49] The Chang study does cite other studies which involved evaluation of road sweeping and these studies have been discussed previously. The Chang study determined that the effectiveness of sweeping and watering in lowering silt levels was dependant on initial silt levels and increased rapidly as silt level increased. The Chang study also found a similar dependency between the initial silt level and the efficiency of sweeping and watering at reducing ambient levels of total suspended particulate near the road. With the high silt levels on roadways in Granite City identified by the US Steel study, this would indicate that the implementation of an appropriately designed road cleaning program should result in higher reductions of silt than found in the Chang study.

44. The UCR study and the studies cited in other comments are based on PM_{10} and TSP. Effective reduction of $PM_{2.5}$ by sweeping would be an even tougher challenge because it is more difficult to sweep and vacuum finer particulate matter. One of the sweeper brands recommended by Illinois EPA in the conveyance system draft permit has specifically indicated that it is not trying to accomplish $PM_{2.5}$ reductions at this time.

This comment's observation, i.e., that it is more difficult for a vacuum sweeper to collect finer material than bigger material, does not mean that vacuum sweepers cannot collect fine particulate. Given the general size of particulate matter, if a road cleaning unit uses a vacuum or air flow to collect material from the surface of a road, particulate matter will be readily entrained and collected in that air stream if the material can be dislodged from the road surface by an appropriately designed sweeping head. Likewise, if a road cleaning unit is equipped with a filter, entrained particulate will be readily removed from the exhaust stream from the unit, so as to minimize direct emissions of particulate from the unit.

The lack of recent studies specifically designed to determine $PM_{2.5}$ reductions from road cleaning is not evidence that reductions in $PM_{2.5}$ emissions are not achieved by road cleaning. Several of the studies submitted with comments confirm significant reductions in PM_{10} emissions through the implementation of a well designed road cleaning program. Similar direct effectiveness should be presumed for reductions in $PM_{2.5}$ emissions, if only because $PM_{2.5}$ is a subset of PM_{10}. In addition, as road cleaning functions to reduce the silt loading on a roadway, it also serves to indirectly reduce particulate emissions. This is because it removes silt from the "road way system" before it can become emissions due to attrition from the passage of vehicles. Whether manufacturers of road cleaning equipment are currently targeting road cleaning for control of $PM_{2.5}$ emissions is not relevant nor is it surprising, given that it appears likely that attainment strategies for $PM_{2.5}$ will not routinely focus on road cleaning.

45. US Steel's offset calculations are flawed due to the use of an improper

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[49] The Chang study involved multiple tests on a single segment of road (broken into two sections). The road segment was located in Taiwan and had traffic levels on the order of 4,000 passenger car units[49] per hour (80,000 passenger car units per day). Baseline silt loadings on the uncleaned road segment tested in this study ranged from 1.2 to 9.8 g/m^2. Silt loadings ranged from 0.63 to 2.1 g/m^2 immediately after (3-4 hours) sweeping and watering.

baseline. Offsets are calculated relative to actual emissions.[50] As presented below, the baseline used in US Steel's study is incorrect.

The baseline emissions were appropriately calculated. The calculation used to determine the emission reductions from road cleaning are based on USEPA's established method of calculating emissions from paved roads. US Steel made site-specific measurements of silt loadings on the road segments in the road cleaning program to determine segment specific emission rates using appropriate methodology from Section 13.2.1 of AP-42 to calculate emissions road dust from paved roads.

46. US Steel improperly used a generic emissions equation instead of the actual emissions from the roads to be swept. The road dust baseline was not determined based on "actual" emissions but rather was estimated from an empirical emission equation for generic paved roads in AP-42, Section 13.2.1. This emission equation is not for the roads that would be swept to generate offsets. They are not "real" because they are not based on actual historic emissions data for the subject roads.

This comment misrepresents requirements for emission reductions to be real and quantifiable. Enhanced cleaning of major roadways in Granite City to remove silt will reduce emissions of fugitive dust that are created by vehicle traffic on the roadways. The USEPA methodology in AP-42 for determining fugitive dust emissions from paved roads, as used by US Steel to determine baseline emission rates and future controlled emissions is an acceptable and appropriate method to quantify the reductions that will occur. Accordingly, the emission reductions from the planned road cleaning program are both real and quantifiable.

The equation in AP-42 is "generic" because it can, with appropriate data inputs, be applied to all roads including those in Granite City. In this case, the baseline emissions were calculated using <u>actual</u> site data including silt loadings and traffic volumes and supplemented with data from Illinois EPA on average vehicle weight. This is the same methodology used by Illinois EPA for estimating fugitive road dust emissions for attainment planning and Transportation Conformity Purposes. It is an acceptable methodology for determining baseline emissions and future controlled emission rates for emission offsets, as confirmed by recent USEPA approval of a SIP revision specifying the use of this equation for calculating offsets from paving roads.

47. USEPA has long stated that the use of "average" emission factors or data from other equipment is not an acceptable basis for determining historic emissions. In a letter to the San Joaquin Valley Air Pollution Control District, USEPA commented on offsets proposed for a project by Shell Oil as follows: "EPA has experienced that the actual emission factor will vary between various pieces of equipment. Therefore, it is essential that data be obtained from the actual equipment that will produce emission reductions."

This comment again miscomprehends USEPA requirements for emission reductions to

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[50] Actual emissions are "the actual rate of annual emissions of a pollutant from an emissions unit as of a particular date" and are "calculated using the unit's actual operating hours, production rates, and types of materials processed, stored or combusted during the selected time period." Thus, "actual" is assumed to mean real – based on measurement or other concrete source-specific evidence. This is further confirmed by USEPA in correspondence on offsets, where it equated actual with real.

qualify as offsets as applied to the road cleaning program that would be used to provide emission offsets for the proposed plant. The amount of emission reductions that would be provided by this program has been determined using appropriate actual emission data to provide site specific data for the emission reductions that will be achieved.

48. The methodology for determining road dust emissions in AP-42, which was used by US Steel, was developed by multiple linear regression from various field studies in which particulate emissions from paved roads were measured together with variables that affect the emissions. The equation is an empirical model that lacks a mechanistic foundation. It is not based on fundamental scientific and engineering principles, but rather statistical relationships. Investigations on behalf of USEPA, (e.g., "Emission Factor Uncertainty Assessment" by RTI International) indicate that the uncertainty in the estimated emissions is large.

The report cited by this comment, "Emission Factor Uncertainty Assessment," does not include any evaluation of the AP-42 methodology for determining fugitive dust from paved road as implied by the comment. This report addressed emission factors for stack emissions of different pollutants, which were based on the results of emission testing on various units. Moreover, while this report examined potential uncertainty associated with such emission factors, it did not suggest that use of emission factors was not appropriate.

With respect to the AP-42 methodology for paved roads, the fact that it was the result of a regression analysis and empirically determined does not show that it should not be used to determine emissions. Empirical approaches are commonly used in engineering to address a variety of phenomena. Moreover, as the equation in AP-42 establishes a relationship between relevant variables, it reflects basic mechanistic or scientific principles. Most simply stated, the methodology in AP-42 is based on emissions of fugitive dust from a road being dependent upon the amount of material, silt, that is present on the road with the potential to be emitted and the amount of activity on the roadway that causes a portion of that material to become emissions (volume and intensity or weight of vehicle traffic.)

49. A detailed study by Venkatram concluded that "[t]here is no reason to believe that the purely empirical AP-42 model for paved road emissions provides credible estimates of the "mean" emission factor." In conclusion, he wrote: "it is not likely to provide adequate estimates of PM_{10} emissions from paved roads. Because the model has little mechanistic basis, it relies on an input variable, the silt loading, that cannot be measured unambiguously."

The Venkatram study shows that the AP-42 model for paved road emissions is not perfect and could potentially be improved with additional research. Indeed the study confirms that the AP-42 model reasonably agrees with observed emissions, given the complexity of the experimental apparatus and methodologies that can be used to directly determine fugitive dust emissions of roadways.[51] This study does not demonstrate that it is not appropriate to use the AP-42 model for purposes of permitting. As previously explained, the AP-42 model is also the accepted method of calculating fugitive dust emissions from roadways. This includes a baseline calculation and a future controlled emission rate

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[51] **The Venkatram study confirms that the AP-42 model can explain over 60 percent of the experimentally determined or observed values of fugitive dust emissions from roadways that were examined.**

calculation to determine emission offsets, as confirmed by the recent USEPA rulemaking on this subject for Maricopa County, Arizona.

50. Other studies have concluded that the AP-42 equation for paved road emissions does not provide credible emissions data. For example, the Kantamaneni study concluded that "[c]onsidering the uncertainties associated with this equation, great care is required in utilizing this model in control programs. In fact, site-specific experimental information would be more desirable than the surrogate measurements found in the EPA study, for SIP development." A study by Claiborn and others concluded that the "published emission factors, especially those for paved roads currently used in EPA models, are subject to large uncertainties, and should be refined if they are to be used as the basis for implementing control strategies to reduce ambient PM_{10}." Thus, others have concluded based on careful field studies that the approach used by US Steel is not appropriate for determining baseline emissions.

This comment mischaracterizes the conclusions of the above studies. The studies recommend the use of site-specific information in place of USEPA's generic data on silt loading. USEPA's generic silt loading data is used when site-specific information is not available. The use of USEPA generic silt loading data adds substantial uncertainty to the credibility of calculations of fugitive dust emissions from paved roads.

It is noted that the US Steel study of silt loadings included collection of site-specific information as recommended by the Kantamaneni study and reflected in the comment by the Claiborn study. Because the US Steel study is based on actual site conditions, it is a better estimate than the published emission factors identified by the Claiborn study, which are based on the generic information on silt loadings provided in Section 13.2.1 of AP-42.

51. Emissions calculated from a generic statistically based equation are suitable for an area-wide inventory, but not a source-specific actual baseline because AP-42 emission factors "essentially represent an average of a range of emission rates, approximately half of the subject sources will have emission rates greater than the emission factor and the other half will have emission rates less than the factor." If half of the road segments have higher baseline emissions than calculated, offsets would be overestimated. Source-specific tests "can determine the actual pollutant contribution from an existing source better than emission factors." US Steel did not measure source-specific baseline emissions, but rather only one variable in a generic equation, even though such measurements (upwind-downwind studies) are feasible and routinely performed.

Upwind-downwind studies for road dust are not routine as part of permitting. Although studies are performed in academic research projects, upwind-downwind studies are not USEPA's recommended method for determining emissions from paved roads and should not be considered routine. As discussed in several of the studies cited by the comment, upwind-downwind studies can suffer from the inability of this method to distinguish between particulate matter from paved roads and particulate from other sources. This typically occurs because a difference between upwind and downwind concentrations cannot be reliably determined given the technical limitations of the ambient monitoring systems. In fact, Venkatram, in a lengthy discussion of the limitations of alternative methods of determining paved road emissions states that upwind-downwind studies "are uncertain because the typical concentration differences are comparable to

the uncertainty in concentration measurements."[52] Given this limitation, the alternative methodology recommended by this comment is rejected.

Moreover, assuming for purposes of argument, that half the segment emission estimates are overestimated and half are underestimated, as suggested by this comment, the total of all the estimates would still reasonably represent the total emissions from all roads. The US Steel study included data on 10 roads and 26 silt samples, which is a statistically significant sampling of the roads. Accordingly, US Steel's emissions calculations take into account site-specific data on traffic volumes and silt content.

52. US Steel also incorrectly determined the baseline by using generic and unrepresentative values for variables in the calculations. It first estimated an emission factor in pounds of PM_{10} per vehicle mile traveled (lb/VMT) using the AP-42 paved road emission equation. This emission factor was then multiplied by the number of miles of roads to be swept and the number of vehicles that passed over the roads each day, yielding PM_{10} emissions in pounds per day. The pounds per day were then converted into tons per year. These calculations do not yield "actual" emissions, which must be used to determine the emissions baseline. Instead, they represent hypothetical emissions.

This comment does not explain why calculations using emission factors based on vehicle miles traveled multiplied by segment lengths and vehicle traffic do not represent "actual" emissions. The methodology is the same methodology approved by USEPA for calculation of offsets in state SIPs. The road segments in questions are actual roads with actual traffic and actual fugitive road dust emissions. Based on testing data, the fugitive road dust emissions are not hypothetical but are real and quantifiable based on USEPA accepted methods.

53. The equation for fugitive dust from paved roads used to calculate the emission factor in lb/VMT includes six variables that must be estimated, including road silt content, average weight of vehicles traveling on the road, and average number of precipitation days per year, among others. Silt content is the only variable that was measured and is site specific.

The silt content was not the only variable for which site-specific data was used. Emission calculations also included specific data on annual average daily traffic volumes, as collected by the Illinois Department of Transportation and available on their website, from the different road segments from which offsets will be obtained. The data collected was from traffic counts conducted in 2005 and made available on its website.[53] In addition, vehicle weight data was obtained from Illinois EPA values which are based on the average weight of vehicles registered in Madison County, Illinois.

54. US Steel's study of silt content indicated its unpredictability. US Steel assumed that "[t]he amount of silt on a roadway is an important factor in the development of estimates of fugitive dust emissions from vehicle travel." In July and August 2007, US Steel conducted a short-term study comprising three rounds of sampling to measure the baseline and post-cleaning silt content.

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[52] **Commenter's Exhibit 37, Akula Venkatram, "A Critique Of Empirical Emission Factor Models: A Case Study Of The AP-42 Model For Estimating PM10 Emissions From Paved Roads", Atmospheric Environment, v. 34, I, 10 (2000).**

[53] **http://www.gettingaroundillinois.com/default.aspx?ql=aadt**

US Steel's study of silt content did not show unpredictability of silt loadings. The study demonstrated, as other studies have found, that a thorough vacuum sweeping program can and will reduce silt levels on paved roads.[54, 55] The study was based on the widely understood and statistically verified principle that paved road emissions are a function of the silt level present on the road.

55. US Steel's fundamental assumption, that silt loading determines fugitive dust emissions, has been demonstrated to be false. The authors of tracer studies on roads in the State of Washington concluded that "no correlation was found between experimentally determined emission factors and silt loading observations." Others similarly concluded that paved road emission factors cannot be predicted based on measurement of any single independent variable, including silt content.

The studies cited in the above comment do not demonstrate that silt loading is not a determinative factor in fugitive dust emissions from roadways so as to discredit the use of USEPA's methodology to calculate emissions of fugitive dust from paved road. The Kantamaneni study does not show that emissions from paved roadways are independent of silt loading, only the inability of the Kantamaneni study to observe the relationship between silt loading and emissions. The inability of the Kantamaneni study to observe the relationship between silt loading and emissions observed by research done for the USEPA does not invalidate the USEPA's reliance on this relationship in the AP-42 paved road fugitive dust equation. In this regard, the Kantamaneni study also further explained that in these studies the "incremental concentration contributed by the road can be comparable to the inherent fluctuations in the background concentrations (and) emission factor estimates become suspect under these conditions." It also indicated that, "(t)he measured upwind concentrations can be larger than the downwind concentrations" and this can introduce errors in emission factor calculations using this method.

Similarly, the study by Zimmer and others (the Zimmer study) was unable to verify the relationship between silt loading and PM_{10} emission rates. However, the Zimmer study was based on limited theoretical review of two Denver, CO specific upwind-downwind studies conducted by others. The upwind-downwind studies utilized in the Zimmer study used upwind-downwind data correlated to a dispersion model to determine PM_{10} emission factors. The limitations of this type of a study were enumerated in the Venkatram critique. Venkatram stated that upwind-downwind analysis in conjunction with dispersion model analysis, as conducted in the Zimmer study and Kantamaneni study, "…is limited by our lack of understanding of dispersion induced by vehicular motion."

56. In a study on the accuracy of the AP-42 emission equation, which was used by US Steel, Venkatram concluded that "silt loading cannot be a stable explanatory variable because it has to be reduced continuously through resuspension by moving trucks…silt loading cannot explain the vehicle-induced resuspension rate because by assumption it is unaffected by emissions." Thus, he concluded "…using silt loading as an explanatory variable in the emission factor model poses a logical dilemma."

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[54] **Commenter's Exhibit 34, Yu-Min Chang et al., "Effectiveness of Street Sweeping and Washing for Controlling Ambient TSP," *Atmospheric Environment*, V. 39, p. 1894 (2005).**

[55] **Studies cited are Ellis and Reavitt (1982), Duncan et al. (1985), Cowherd (1988), Fitz (1998), and Fitz and Bumiller (2000).**

The analysis by Venkatram cited in this comment does not show that particulate emissions are independent of silt loading. Venkatram's observation that silt loadings are reduced through resuspension by moving vehicles is only a part of the relevant analysis. Road cleaning is also a "removal process" that acts to lower the loading of silt on a roadway, with an accompanying reduction in particulate emissions. Other processes[56] act to deposit silt on roadways, so that a certain level of silt is maintained on the roadway in the absence of specific measures to alter the balance between silt deposition and removal processes. In AP-42, USEPA has provided an appropriate method, which addresses these phenomenon, to calculating fugitive dust emissions from paved roads.

57. US Steel's snapshot study demonstrated that silt content on the subject roads is highly variable. This is a well known fact and is caused by a multitude of constantly varying factors that influence silt loading, including spillage from trucks, road shoulder condition, road surface condition, vehicular carry-out from unpaved feeder roads, water and wind erosion from adjacent exposed areas, orientation of road with prevailing wind direction, motor vehicle exhaust, brake dust, pavement wear, winter sanding and salting, vehicle speed and atmospheric deposition, among other factors. This variability should have signaled that the approach was doomed for calculating "actual" emission reductions. At the very least, it should have triggered a literature review and much more extensive sampling to develop road-segment-specific emission equations.

US Steel's study did not show that silt loadings on different road segments are so variable that they prevent a reasonable determination of the emission reductions to be made from the planned Road Cleaning Program. The specific action recommended by this comment, i.e., development of road-segment specific emission equations to address the role of different causative factors on each roadway segment, cannot be taken seriously. This would not act to improve the quality of the emission data that would be generated. It would likely do just the opposite, as the approach to the determination of emission reductions from the Road Cleaning Program would become idiosyncratic, without any consistent connection to established methodology for determining emissions of fugitive dust from roadways.

58. The US Steel study showed the inherent flaws, and thus ineffectiveness, of road sweeping. During the Summer 2007 road study, one road segment (Benton Street) was removed from further study because the first tests indicated a higher silt content after sweeping. After removing this road segment, US Steel was able to make the study look more successful than it actually was by using the average silt content from measured roads. A global silt removal efficiency was then estimated for those sites that behaved according to US Steel's theory of sweeping efficiency rather than the road segment-by-segment approach set out in the sampling protocol.

US Steel did remove the Benton Street road segment from <u>its</u> planned proposed road cleaning program. This action which was taken as a result of sampling of silt loading, showed cleaning on that road segment would have little effect. This is attributed to the atypical nature of travel on this short road segment, which connects two other segments that are part of the program. Because US Steel's sampling showed this segment had physical restrictions that would limit the effectiveness of road sweeping, the removal of that segment from the

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[56] **Silt deposition on roadways will also result from vehicle exhaust, the vacuuming effect of moving traffic on silt from road shoulders, the carryout of dust and dirt from dusty roads, and atmospheric deposition.**

program was consistent with US Steel's objectives for the emission reductions achieved by the program. It does not indicate that the entire program would be ineffective in providing the necessary emission offsets. Incidentally, in the issued permit, the Illinois EPA has "restored" the Benton Street segment to the Road Cleaning Program. This action was taken for several reasons. This road segment is part of a truck route that goes west through Granite City. Given, its location, it is readily included in the program. Inclusion of this road segment in the program provides additional control for emissions of fugitive road dust.

The comment is incorrect in its assertion that US Steel's use of a limited average silt content made "the study look more successful than it actually was". US Steel removed the highest silt levels from its averaging to avoid biasing the results of this study on the high side. As explained by US Steel, a segment by segment approach would have resulted in greater emission reductions than were calculated by US Steel using the average approach. This is because of the very high initial silt loadings and higher cleaning efficiencies identified for segments with the highest baseline emission rates. The comment is wrong in its assertion that the segment by segment approach results in better estimates of the actual reductions which can be achieved.

59. US Steel's one-time snapshot does not disclose anything about the silt content anywhere else along the roadways or at any other point in time. Accordingly, US Steel's study is not useful for establishing an average silt baseline, let alone a paved road fugitive dust emission baseline.

Representative sampling, conducted as specific locations and particular times, is routinely used to broadly characterize the nature or condition of a system. It is appropriate in this case to assess the silt loadings on the roadways that are part of the Road Cleaning Program.

60. The average weight of vehicles traveling each road segment was based on the average vehicle weight (4.3 tons) used by Illinois EPA for Madison County fugitive road dust and adjusted upwards to account for increased numbers of transport trucks entering and exiting the Granite City Works (and presumably present on the subject roadways). The increased average vehicle weights range from 4.4 to 6.4 tons. Illinois EPA simply took the data it received from US Steel at face value without conducting its own analysis. Nothing is known about the Madison County data that was the starting point, the typical truck volumes and gross vehicular weights of transport trucks serving the mill used to adjust the Madison County data, or the supporting calculations. Thus, the truck weight variable cannot be meaningfully reviewed. In addition, adjusted county-wide estimates for an undetermined period of time based on an unknown method adjusted with typical truck volumes cannot be used to calculate "actual" baseline emissions from the subject roads.

It is not feasible to determine average vehicle weights by actual measurements of the weight of the individual vehicles traveling on different road segments in an area. The use of average vehicle weights based on registration information for vehicles is generally considered appropriate to determine the weight of vehicles traveling on roadways in an area. This sets the "base weight" for vehicle traffic as 4.3 tons per vehicle, which is the weight used by Illinois EPA for development of the emission inventory for Madison County and was provided to US Steel by the Illinois EPA.

It is also appropriate for US Steel to have refined this data for average

vehicle weight by specifically accounting for the truck traffic serving the Granite City Works, for which it has specific data on the volume and weight of truck traffic. As explained by US Steel, this adjustment has a minor effect on heavily traveled road segments, raising the average weight from 4.3 to 4.4 tons per vehicle. On less heavily traveled roads, closer to the Granite City Works, where truck traffic for the mill makes up more of the vehicles, the effect was greater, with the highest calculated average vehicle weight for a road segment being 6.4 tons.

61. US Steel did not provide enough information to determine whether traffic counts were accurate. The emissions in pounds per day from each road segment were calculated by multiplying emission factors calculated in lb per vehicle mile traveled (VMT) by the length of each segment and the average daily traffic on each road segment. The average daily traffic data were taken from the Illinois Department of Transportation website. It is unclear when the counts took place, the accuracy of the counts, and whether they are for the exact segments that would be swept or are for a larger segment.

The traffic volumes used to calculate roadway emissions are data collected by the Illinois Department of Transportation data for 2004 and 2005 for the individual road segments from which offsets will be obtained. Data for traffic volumes from the Illinois Department of Transportation are routinely used in developing emission inventories.

62. Average daily traffic varies from hour to hour, day to day, and season to season, As traffic volume generally increases over time, it is not reasonable to select an estimate from one year and consider it as representative of an offset baseline period. US Steel cannot expect to achieve real offsets if its calculations are not based on real numbers.

The data used by US Steel in calculating offsets was "real" data. It was supplied by the Illinois EPA and is the same data utilized by the Illinois EPA to develop the fugitive dust emissions estimates for attainment modeling, so is an appropriate basis for estimating fugitive dust for Madison County roads. Likewise, traffic data from the Illinois Department of Transportation is the best available information from the State of Illinois for each individual road segment and is appropriate for use in estimating baseline emissions.

Traffic volume may increase over time, as observed by this comment, and other factors that may effect potential emissions from roadways may also change over time. To address such changes, the issued permit requires US Steel to periodically reevaluate and confirm that the road cleaning program that is being implemented obtains the emission reductions that are required to be maintained as emissions offsets.

63. Offsets were provided on an annual basis, which does not assure that emissions from the proposed plant are offset because of differences in the temporal variation of the emissions of the plant and roads. As compared to the proposed plant,[57] the emission reductions due to road sweeping will exhibit significant temporal variations because of vehicle traffic patterns, climatic conditions, and moisture content of the road

[57] The principal emission unit at the proposed plant, the main stack, will emit continuously. The other significant emission units, pushing, charging, and quenching, are cyclical, lasting 6 hours and repeated at 12-hour intervals. Further, emissions peak during when the spray dryer and baghouse system are offline for maintenance.

dust. Traffic volume and composition, for example, varies temporally. Roads not only carry different volumes of traffic at different times of the day, but the types of vehicles vary throughout the day, from day to day, and from year to year. Trucks may predominate during non-rush hour periods. Thus, emission reductions, if any, from road sweeping, will not be uniform and will vary from hour to hour, season to season, and year to year. In addition, no emission reductions would occur during periods of precipitation or wet weather when the plant would still be operating. Emission reductions based on road sweeping do not match, hour for hour, the emission increases and thus they cannot qualify as offsets.

The degree of precision in "compensation" suggested by this comment is not required for emissions offsets. First, the planned emission offsets will reduce the loading of $PM_{2.5}$ emissions in the Greater St. Louis area, so as to generally act to improve air quality. Second, as air quality for $PM_{2.5}$ is a regional phenomenon, resulting from combined contribution of many sources, it is not appropriate to place particular emphasis on the precise timing of emissions. In other words, to come into compliance with the NAAQS for $PM_{2.5}$, emissions must consistently be lowered since one cannot coordinate emissions of sources and weather, so as to only control emissions when weather is conducive to high concentrations of $PM_{2.5}$ in the atmosphere. Third, as reasonable further progress for $PM_{2.5}$ is determined in terms of annual emissions, consistent with Section 171 of the Clean Air Act,[58] it is also appropriate for emission offsets to be addressed in terms of annual emissions.

64. The planned offsets would be considered to be "nontraditional offsets" by USEPA and therefore subject to more requirements. USEPA places additional requirements on these nontraditional offsets to ensure they actually occur because they are ubiquitous, transient, and unpermitted. For example, in comments on a proposal to pave unpaved roads, USEPA wrote:

> To demonstrate emission reductions are surplus, the [local air pollution control district] must include, among other things, a comprehensive emission inventory, identify roads to pave, include the schedule for road pavement, and elaborate on the control measures that are responsible for the emission reduction credits. EPA policy requires that nontraditional credits, such as those from road paving, be created and used pursuant to rules approved by EPA into state Implementation Plans which contain quantification protocols, proper monitoring, record keeping and reporting requirements, and mechanisms to enforce the creation and validity of the credits.

The planned road sweeping program would not meet these requirements. Most importantly, USEPA has not approved road sweeping as part of Illinois' SIP. Road paving has only been allowed when stringent control policies were first in place. No such stringent controls are present in the current draft permit. Therefore Illinois EPA should reject road sweeping as an offset because it does not meet the requirements for either traditional or nontraditional offsets.

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[58] **"The term "reasonable further progress" means such annual incremental reductions in emission of the relevant air pollutant as are required by this part or may be reasonably required by the Administrator for the purpose of ensuring attainment of the applicable national ambient air quality standard by the applicable date." Section 171(1) of the Clean Air Act.**

The USEPA comments, which this comment cites,[59, 60] were addressing "external" emission offsets, i.e., paving of public roads, which would performed by a separate entity not covered by the permit for a proposed project. This is not relevant to the proposed project, in which emission offsets would be generated by the direct actions of US Steel, or alternatively Gateway. The distinction between "internal offsets" and "external offsets" is significant because external offsets cannot be made enforceable on the party that is responsible for implementing the offsets by permit and must be made enforceable by other means.[61] Accordingly, if a source will generate its own offsets (internal

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[59] Commenter's' Exhibit 45, a September 2002 letter from USEPA Region IX to the Sacramento Metropolitan Air Quality Management District, involved the creation of PM offsets through paving of roads. In that case, those offsets were generated in part by a party other than the source, namely the governmental entity that "owned" the roads to be paved. As USEPA Region IX notes, because of this fact, the source had to provide, among other things, information necessary to "identify roads to pave, include the schedule for road pavement, and elaborate on the control measures that are responsible for the emission reduction credits." Such information could not be generated without the involvement and agreement of such public entity. Therefore, these offsets constituted "external" -- or, in the words of USEPA Region IX, "nontraditional" – emission offsets, and a SIP revision was necessary to establish "quantification protocols, proper monitoring, record keeping and reporting requirements, and mechanisms to enforce the creation and validity of the credits." That is, SIP provisions were necessary to ensure that the public entities used the money they received from the source for road paving, and not for other purposes.

[60] Commenter's' Exhibit 41, a March 14, 2000 letter from USEPA Region IX to the San Diego County Air Pollution Control District, involved the creation of offsets through third parties' purchase of trucks and marine engines that emit lower levels of NOx. These offsets also were generated by a party other than the source, namely, the third parties who would own and operate the trucks and the marine engines. In this case, USEPA Region IX noted that "a portion of the draft framework must be submitted to EPA for State Implementation Plan ('SIP') approval to ensure the vehicle operator provides accurate, truthful records to the MERC [Mobile Emission Reduction Credit] user (i.e., to ensure the credits generated are federally enforceable) and to ensure that if a vehicle/engine is replaced, it is replaced with an engine that is as low emitting as what it replaces, with respect to NOx." Commenter's' Ex. 41, Enclosure 1, at 1. ***Accord, id***. at 4-7 (discussing requirements that would be imposed on the vehicle owners and operators under the SIP). Federally enforceable requirements could not be imposed on the truck and marine engine owners and operators through the source's permit, and the truck and marine engine owners and operators did not have their own permits in which federally enforceable conditions could be included; thus, a SIP revision was required.

[61] Appendix S to 40 CFR Part 51, "Emission Offset Interpretative Ruling," provides that "emission offsets may be proposed either by the owner of the proposed source or by the local community or the State." 40 CFR Part 51, App. S, Sec. V, ***Administrative Procedures***. In the case of "[s]ource initiated emission offsets," a source "may propose emission offsets which involve: (1) Reductions from sources controlled by the source owner (internal emission offsets); and/or (2) reductions from neighboring sources (external emission offsets)." ***Id.*** An internal emission offset "will be considered enforceable if it is made a SIP requirement by inclusion as a condition of the new source permit and the permit is forwarded to the appropriate EPA Regional Office." ***Id.*** On the other hand, an external emission offset "will not be enforceable unless the affected source(s) providing the emission reductions is subject to a new SIP requirement to ensure that its emissions will be reduced by a specified amount in a specified time. Thus, if the source(s) providing the emission reductions does not obtain the necessary reduction, it will be in violation of a SIP requirement and subject to enforcement action by EPA, the State and/or private parties." ***Id.*** This issue also is addressed in USEPA's ***New Source Review Workshop Manual, Prevention of Significant Deterioration and Nonattainment Area Permitting***, Draft, October 1990, at G.8., which states: "The reviewing agency ensures that all offsets are federally enforceable. Offsets should be specifically stated and appear in the permit, regulation or other document which establishes a Federal enforceability requirement for the emissions reduction. External offsets must be established by conditions in the operating permit of the other plant or

offsets), those offsets can be made enforceable through the source's permit for a project. However, if a source will use offsets generated by some one else (external offsets), that entity cannot be governed by the source's permit. Thus, external emission reductions that provide offsets must be made enforceable through either a federally enforceable permit or a SIP revision.

This principle also is demonstrated by USEPA's approval of Arizona's SIP revision with regard to regulations of Maricopa County, Arizona, pursuant to which sources can generate PM offsets by paying for the paving of unpaved roads in the county. 72 FR 43580, 72 FR 43537.[62]

However, in this case, the road cleaning program will be implemented by US Steel or Gateway. No action by other parties is necessary. Thus, these offsets constitute internal offsets for purposes of 40 CFR Part 51, App. S. Accordingly, a SIP revision, which can be required for external offsets to provide enforceability against parties who are not subject to a permit, is not required.[63]

65. The draft permits for the proposed coke plant project would not assure reasonable further progress toward $PM_{2.5}$ nonattainment.[64] The draft permits would only require emissions offsets equal to the proposed project's permitted emissions, which is not sufficient. In order to ensure that the project results in a net air quality benefit, the amount of offsets must be greater than the project's emission. USEPA's New Source Review Workshop Manual states that "the ratio of required emission offsets to the proposed source's emissions must be greater than one." The permits

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in a SIP revision." *See also USEPA Approval and Promulgation of Implementation Plan: Ohio*, 45 FR 56845, Aug. 26, 1980 (noting that an offset for NSR purposes "can be provided by the new source internally or provided by other sources externally.")

[62] Among other things, these regulations require sources that wish to use such PM offsets to submit an Offset Plan to the County and require the County to consider and approve such Offset Plan pursuant to specified procedures. *Maricopa County, Arizona Regulation II – Permits and Fees, Rule 242, Emission Offsets Generated by the Voluntary Paving of Unpaved Roads* (attached as TSD Attachment 1 *USEPA Region IX Air Division, Technical Support Document for EPA's Rulemaking for the Arizona State Implementation Plan Regarding Maricopa County Air Quality Department Rule 242, "Emission Offsets Generated by the Voluntary Paving of Unpaved Roads*," USEPA Rulemaking Document EPA-R09-OAR-2007-0610-0005 (July 19, 2007)). The regulations also require sources relying on such offsets to submit to the County documents including "a letter or agreement from the appropriate state or local government stating that the public road(s): …d. Will be maintained," and "the local or state governments' report or written statement evaluating the condition of each roadway segment." Rule 242, §§ 301.4, 304.1. Thus, under these regulations, offsets only can be generated with the involvement of the County and of state or local government, and thus, such offsets are "external" and a SIP is required; the duties imposed on the county and state or local governments could not be imposed through a source's permit or permits issued to those government bodies.

[63] Where a third-party which has its own federally enforceable permit reduces emissions so as to generate offsets for another source, Illinois EPA normally includes conditions in both the third-party's permit and the source's permit requiring both to take steps necessary to maintain the emission reductions and the offsets.

[64] 35 IAC 203.302(a) provides that a person proposing a major modification "…shall provide emission offsets equal to or greater than the allowable emissions from the source…to determine that the source or modification will not interfere with reasonable further progress as set forth in Section 173 of the Clean Air Act (42 USC. 7401 et seq.)." Section 173 of the Clean Air Act requires that "sufficient offsetting emissions have been obtained, such that total allowable emissions from existing sources in the region…and from the proposed source will be sufficiently less than total emissions from existing sources…so as to represent…reasonable further progress" toward meeting the NAAQS."

for the coke plant project should require $PM_{2.5}$ offsets in a ratio greater than 1 to 1 to assure reasonable further progress towards meeting the $PM_{2.5}$ NAAQS.

The State of Illinois has maintained Reasonable Further Progress towards attainment of the NAAQS for $PM_{2.5}$. Accordingly, there is not a need for additional offsets to be provided with this project to address a deficit in progress toward attainment. However, the issue raised by this comment is addressed as the issued permit sets lower limits on the particulate matter emissions from the proposed coke plant than would have been set by the draft permit, so that the emission offsets that have been provided are greater than the permitted emissions of the coke plant project.

66. The offsets and the emissions being offset are not of the same type, and cannot provide the same level of health benefits. The emission offsets for a proposed project "must…be of a type with approximately the same qualitative significance for public health and welfare as that attributed to the increase from a particular change…" The draft permits would propose to largely offset the permitted emissions of the proposed coke plant, which are combusted coke oven gas (154.24 tons/year) and coal and coke dust (76.72 tons/year), with fugitive dust from roads. However, only 3.13 tons/year of the permitted emissions of the proposed plant would actually be road dust. PM_{10} offsets generated by cleaning paved roads should not be used to offset combustion and coal/coke emissions because of dramatically different health effects of $PM_{2.5}$ and PM_{10}.

The permitted emissions of the proposed plant are not so readily characterized as this comment would suggest. The emissions of the proposed plant are mixtures of different types of particulate. Only a fraction of the permitted particulate emissions of the proposed plant relate directly to combustion, i.e., 30.24 tons/year as PM_{10}, from bypass venting through the waste heat stacks. The rest of the permitted particulate emission of the plant, i.e., 203.85 tons/year as PM_{10}, are a mixture of the particulate from the different units at the plant. In this regard, it is not appropriate to characterize the emissions from the main stack as combustion of coke oven gas, as the emissions of the main stack would be a mixture of lime from the spray dryer absorber and combustion emissions from the heat recovery coking process.

The emission offsets for the proposed plant would include an actual reduction in particulate emissions of 31.74 tons/year as PM_{10} from the reduction in combustion particulate that would accompany the desulfurization of coke oven gas from the existing coke oven batteries. An actual reduction of 236.03 tons/year as PM_{10} would also be provided from a program to clean certain public roads. These emissions would be a mixture of the materials that make up the silt on roads in Granite City, including not only mud, dirt, and biological debris but also carryout, spillage, and atmospheric deposition. The Granite City Works is both the largest industrial facility and the largest source of emissions in Granite City. Accordingly, it should be expected that carryout, spillage and localized atmospheric deposition from the Granite City Works would make a significant contribution to the silt loadings on the public roads covered by the road cleaning program. In total, the emission offsets would be 267.77 tons/year as PM_{10}, which is 33.68 tons/year more than the permitted emission of the proposed plant.

In summary, 31.74 tons/year of combustion-related reductions from desulfurization would offset 30.24 tons/year of new direct combustion emissions from the proposed plant. The industrial-biased, mixed reduction in emissions

from the road cleaning program, 236.03 tons year, would offset 203.85 tons/year of new mixed, industrial emissions from the coke plant. While the character of the "project" emissions and the "offsetting emissions" are not identical, this is not required. 35 IAC 203.303 only requires that the emission offsets for a proposed project be "… of a type with approximately the same qualitative significance for public health and welfare." This criterion is satisfied. Moreover, when making this determination, it is also appropriate to generally consider other aspects of the offsets that are occurring. The new mixed particulate emissions, most of which would be emitted from elevated stacks, would be offset with mixed reductions that are occurring at ground level. This acts to magnify the local benefit of the emission reductions as compared to the impacts of the new emissions.

67. The chemical composition and particle size distribution of combustion emissions and coal and coke fines are fundamentally different from road dust. Coke oven combustion particulate is predominantly fine particles with a diameter of less than 2.5 microns. Fugitive road dust is predominantly coarse particles with very little $PM_{2.5}$.[65]

This comment is based on a study by Weitkamp and others that examined the character of emissions from a by-product recovery coke plant. There is no support for this statement as applied to the proposed heat recovery coke plant. This comment presumes to understand the size distribution of particulate emissions of the various emission units at the proposed heat recovery coke plant and the major roadways in Granite City without providing any supporting data. While individuals make informed predictions about the predominance of fine or coarse particulate in the emissions from different units at the coke plant, it would be inappropriate to make permitting decisions based on those predictions when it is not legally necessary to do so.

68. Coke oven particulates are primarily condensed particles including sulfate, nitrates, and sulfuric acid with little carbon or organic compounds. In contrast, road dust is crustal material consisting primarily of silica. The dissimilar size distribution and chemical composition of combustion and fugitive dust particulate matter result in different atmospheric transport behavior and distinctive health impacts.

This comment flagrantly misrepresents a statement made in the Gateway application about the character of the emissions of the proposed plant, as it converts a discussion about the possible character of the condensable fraction of particulate emissions into a factual statement about both filterable and condensable particulate.[66] With regard to the claims about the character of

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[65] According to a USEPA-supported website, "The size of particles is directly linked to their potential for causing health problems. Small particles less than 10 micrometers in diameter pose the greatest problems, because they can get deep into your lungs, and some may even get into your bloodstream. Exposure to such particles can affect both your lungs and your heart. Larger particles are of less concern, although they can irritate your eyes, nose, and throat.

[66] **A narrative discussion entitled "PM Controls for Condensable Particulate Matter" in Gateway's January 2007 submittal states "Information about condensable PM is limited for many sources, including heat recovery coke ovens. The constituents are generally a mixture of sulfate, nitrate, carbon, and organic and inorganic material. The largest potential source of fine PM (filterable and condensable) are the coke oven flue gases. Since good combustion is inherent to the heat recovery coking process, it is likely that the condensed particles include sulfates, nitrates and sulfuric acid with little carbon or organic compounds." This statement does not address the preponderance of either**

road dust, the composition of the silt on the roads in Granite City has not been determined. Because of the proximity of these roads to the Granite City Works, the silt on roads should include more "industrial-related" material than present in locations that are not located in a community with a steel mill. The comment's claim that road dust is predominantly coarse particulate consisting of silica has no support. Lastly, in adopting the $PM_{2.5}$ NAAQS, USEPA did not set separate NAAQS for the different components of $PM_{2.5}$ based on their chemical composition. As such, it is inappropriate to broadly suggest that the health impacts from inhalation of siliceous material are of less concern that the impacts from inhalation of sulfates, nitrates, or other chemical species that may be present in emissions from the proposed coke plant.

As related to dispersion of emissions in the atmosphere, as previously explained, because road dust is emitted at ground level, reduction in emissions of road dust will have direct, localized benefits for particulate matter air quality in the vicinity of the roads. The particulate matter emissions of the proposed coke plant, which will be discharged through stacks at elevated temperatures, will have less impact on local air quality. Accordingly, the road cleaning program should result in a net improvement in local air quality in Granite City, where the need for improved air quality is greatest.

69. USEPA has concluded that $PM_{2.5}$ and PM_{10} have different properties and health effects and thus should be separately regulated and measured so that effective control strategies can be developed. In response, EPA promulgated separate NAAQS for $PM_{2.5}$ and PM_{10}, reflecting the different public health and welfare impacts of the two pollutants.

This comment reflects a flawed understanding of USEPA's actions in adopting National Ambient Air Quality Standards (NAAQS) for particulate matter. As the technical ability to measure the levels of smaller particles in the atmosphere has improved, USEPA has adopted new and revised NAAQS that directly address smaller particulate matter. [67] This has occurred because the health effects of particulate matter observed in laboratory and epidemiological studies correlate better with the concentration of smaller particulate matter in the atmosphere. In other words, studies indicate that $PM_{2.5}$ is a better indicator of many health effects of particulate and thus may be more effectively used in protecting against those health effects. This is not the same as concluding that $PM_{2.5}$ and PM_{10} have entirely different health effects. This is clearly not the case because $PM_{2.5}$ is a subset of PM_{10}. That is, all $PM_{2.5}$ also constitutes PM_{10}. Accordingly, PM_{10} shares the same heath effects that have been found to be correlated with the levels of $PM_{2.5}$ in the ambient air.

70. Since USEPA adopted a separate NAAQS for $PM_{2.5}$ in 1997, a large number of peer-reviewed studies have validated earlier studies that link ambient $PM_{2.5}$ pollution with serious morbidity and mortality. This research has also expanded the list of potential health effects associated with $PM_{2.5}$

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filterable or condensable particulate in the emissions. It also speculates on the likely composition of the condensable particulate from the coking process.

[67] **The original NAAQS for particulate matter addressed total suspended particulate (TSP), with 24-hour and annual standards at 260 and 75 µg/m^3, respectively, with monitoring conducted with samplers that did not perform any size separation for collected material. The USEPA then adopted a NAAQS for PM10, with standards at 100 and 50 µg/m^3, with monitoring conducted with a sampler that separated PM10 from TSP, to provide data for PM10. The NAAQS for PM2.5 represented a further step in this sequence, with standards originally set at 65 and 15 µg/m^3, with a further refinement to sampling technology. In response to new information, the USEPA recently lowered the 24-hour NAAQS for PM2.5 to 35 µg/m^3, effective December 17, 2006.**

and identified health effects at lower exposure levels than previously reported.[68] The USEPA concluded that this research confirms causal associations between $PM_{2.5}$ and both morbidity and mortality from cardiovascular and respiratory diseases. These effects are caused by $PM_{2.5}$, not PM_{10}. Thus, 35 IAC 203.303(b)(1) prohibits use of PM_{10} emission reductions as offset for the $PM_{2.5}$ emissions of the proposed coke plant.

This comment is again based on the faulty premise that the health effects of $PM_{2.5}$ are different from those of PM_{10}. As $PM_{2.5}$ is a subset of PM_{10}, PM_{10} and $PM_{2.5}$ share similar health effects. The comment further suggests that reductions in PM_{10} emissions are being used to offset $PM_{2.5}$ emissions. However, reductions in PM_{10} emissions are being used to offset PM_{10} emissions. This is because it would be impossible for offsetting to be reasonably conducted in terms of $PM_{2.5}$ emissions because of the lack of credible data for $PM_{2.5}$ emissions, which can be linked to the absence of a promulgated USEPA test method for $PM_{2.5}$. As previously discussed, 35 IAC 203.303(b)(1) is satisfied by the emission offsets that would be relied upon for the proposed coke plant.

71. Others have recognized the fact that road dust and combustion particulate do not have the same health effects. In June 2000, the California Air Resources Board sent a letter to the individual air pollution control districts in California to express concerns regarding the use of coarse particulate matter emission reductions to offset combustion-generated fine particulate matter increases:

> Fine particulates, those equal to or smaller than 2.5 microns in diameter ($PM_{2.5}$) have unique pulmonary dynamics. They selectively penetrate into lung alveoli. Whatever chemicals the particulates have absorbed, either at their source or from ambient air, are also transported into the body. Fine particulate matter emissions are a serious human health concern. …There is no technical justification for allowing PM emission reductions from road paving to offset PM increases from natural gas combustion.

The action by the California Air Resources Board cited in this comment is not relevant to the emissions offsets that would accompany the proposed plant, as that action addressed a different set of circumstances. This action by the California Air Resources Board addressed emission offsets for proposed units that would burn natural gas, which is a very clean fuel as it is delivered to a combustion unit. The proposed coke plant is a process plant, with a variety of different emission units, none of which are natural gas-fired combustion units. To the extent that combustion does occur as part of the coking process, it

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[68] Overwhelming scientific evidence shows that long-term exposure to PM2.5 air pollution contributes to pulmonary and systemic oxidative stress, inflammation, progression of atherosclerosis, and risk of ischemic heart disease and death. A recent study found that each 10-μg/m^3 increase in PM2.5 air pollution was associated with approximately a 6% increase in cardiopulmonary mortality and an 8% increase in lung cancer mortality. Short-term exposure is equally damaging and contributes to complications of atherosclerosis, such as plaque vulnerability, thrombosis, and acute ischemic events. A recently published study in the American Heart Association's peer-reviewed journal *Circulation* evaluated the role of PM2.5 exposure in triggering acute ischemic heart disease event. The study found a sharply elevated risk of heart attacks for people with clogged arteries after just a day or two of short-term exposure to PM2.5. One coauthor of the study reportedly stated that the results should prompt doctors to advise those with coronary heart disease to stay indoors as much as possible on especially sooty days, and that he was already changing his advice to patients based on the results, including advising in severe cases to move to a less polluted environment.

involves combustion of coal, as the volatile matter in coal is driven off by the coking process, and this exhaust must routinely be controlled by the dry scrubber and baghouse system on the main stack.

72. Pursuant to 35 IAC 203.303(b)(2), the emission offsets provided "[m]ust, in the case of a fuel combustion source, be based on the type of fuel being burned at the time permit application is filed..." The emissions from the main stack (permitted 157.68 ton/yr) and the individual waste heat stacks (permitted 30.24 ton/yr) are from the combustion of gas generated by the coking process. To comply with this provision, emission offsets must be provided from combustion of the same type of fuel.

This comment misconstrues 35 IAC 203.303(b)(2). This provision addresses how the amount of emission offsets from a proposed change in operation of an existing fuel combustion emission unit must be determined.[69] The provision does not establish any additional requirements for the emission offsets that must be provided for proposed new units that combust fuels.

73. There are currently two byproduct coke batteries at the Granite City Works, which produce about 500,000 tons of coke per year.[70] The draft permits rely upon future desulfurization of the coke oven gas from these existing batteries. Additional controls should be installed to reduce $PM_{2.5}$ emissions from the combustion of this coke oven gas to offset the emissions from the proposed new coke plant. This could include removing more sulfur than currently planned or installing particulate controls on units burning coke oven gas to reduce $PM_{2.5}$ emissions.

The emission offsets planned by Gateway and US Steel for the proposed coke plant are acceptable. As such, Gateway and US Steel are not required to consider other possible sources of offsets as requested by this comment. Moreover, given the direct, local benefit of emission offsets from the road cleaning program, it is reasonable for the bulk of the offsets for the proposed plant to be provided by the road cleaning program. In the event that a further reduction in the particulate emissions from combustion of coke oven gas is identified as a necessary component of the attainment strategy for Granite City, the issuance of the permits for the proposed plant do not block such reduction as part of the attainment strategy. However, given the low concentration of particulate in the emissions from coke oven gas combustion, which are vented through stacks with good dispersion, it is unlikely that coke oven gas will be a target for further reductions after desulfurization, which acts to reduce the emissions of condensable particulate. It is more likely that the reductions in direct $PM_{2.5}$ targeted by the attainment strategy will be related to improved capture and control of particulate from furnace operations.

74. Coke oven gas desulfurization would reduce the H_2S content of coke oven gas at the existing facility from 500 to 66 grains per 100 standard cubic

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[69] **The provision requires that the determination of the amount of emission offset that are available from a proposed change in operation of an existing fuel combustion emission unit must consider the fuels that were actually being burned. The amount of emission offsets cannot be determined from other fuels that the unit was capable of burning but was not actually using.**

[70] These two batteries currently supply about 45 percent of the coke required by the mill. The CAAPP application indicates that these batteries burn about 250 million Btu/hr of coke oven gas to provide the heat required for the coking process, with maximum emissions of 214 ton/yr of PM10. The rest of coke oven gas from the batteries is used elsewhere at the mill. The emissions from burning coke oven gas are predominately PM2.5.

feet (gr/scf). Elsewhere, it is claimed that desulfurization would provide 92 percent control of SO_2. However, up to 98 percent control is possible, as shown by US Steel's facility in Allegheny County which currently lowers H_2S levels in coke oven gas to between 15 and 20 grain/100 dscf.

The typical performance of the new coke oven gas desulfurization system at the Granite City Works should be similar to that of the system at US Steel's Clairton works. In this regard, the system is <u>required</u> to reduce the sulfur content of coke oven gas to no more than 25 grains of H_2S/100 scf, monthly average, excluding outages, startup, shutdown, and upsets such as failure of fans, pumps or heat exchangers and aberrations in the composition or condition of the raw coke oven gas.

In addition, the circumstances of US Steel's Clairton works are not relevant. Among other things, the Clairton works have a total of nine byproduct recovery coke oven batteries and currently produces about 4,700,000 tons of coke per year. Even when the proposed coke plant is constructed, the Granite City Works would only produce a fraction of the coke produced at the Clairton works.

75. US Steel has failed to present offsets that will be enforceable by either Illinois EPA or an affected party. The emission offsets provided "[m]ust be federally enforceable by permit." This means the offsets must be enforceable by USEPA.[71] This ensures that the emission reductions are real and the Illinois EPA can keep the reductions in effect, such as through permit requirements, as in the present case. This is manifested in the NA NSR rules, as they require that "…the permit shall include conditions specifying the manner in which the requirements of Subparts B and C of this Part [Part 203] are satisfied." 35 IAC Part 203.203(c). The draft permit for the coke plant project would not satisfy this requirement. This is because the details of the road sweeping program are only in the coke conveyance permit issued to US Steel, and not in the Gateway permit except for the general statement that "Gateway and US Steel shall maintain 268 tons of PM_{10} emission offsets generated by the following activities/projects:…" If US Steel were to close its Granite City Works or if US Steel were to fail to implement (or implement adequately) the road sweeping provisions in the coke conveyance system permit, it would be extremely difficult if not impossible for Illinois EPA or USEPA to require Gateway to conduct the road sweeping program described only in the US Steel coke conveyance permit.

Gateway could readily implement the Road Cleaning Program in the circumstances postulated by this comment, and enforcement could be readily taken if Gateway failed to do so voluntarily. To facilitate such actions, the issued permit for the coke plant includes additional language strengthening the linkage between the coke plant permit and the coke conveyance permit, as the latter permit provides the detailed provisions of the Road Cleaning Program for offsets. However, it is not necessary for the Road Cleaning Program to be duplicated in its entirety in the permit for the proposed coke plant.

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[71] Under federal NA NSR rules, "Federally enforceable means all limitations and conditions which are enforceable by the Administrator, including those requirements developed pursuant to 40 CFR Parts 60 and 61, requirements within any applicable State implementation plan, any permit requirements established pursuant to 40 CFR 52.21 or under regulations approved pursuant to 40 CFR Part 51, Subpart I, including operating permits issued under an EPA-approved program that is incorporated into the State implementation plan and expressly requires adherence to any permit issued under such program."

76. The "enforcement" mechanisms in the draft coke conveyance permit would be too general to be meaningful, or enforceable as a practical manner. The road sweeping program would require "good air pollution control practices" to reduce road dust. The draft permit also lists options for those practices – flushing, dust suppressant application, etc. However, the draft permit would only provide detailed requirements for vacuuming. The other requirements are unenforceable because the permit would not define flushing or dust suppressant, and does not state when such practices should be implemented or how often. Lack of such requirements means that Illinois EPA could not determine whether US Steel has complied with the provisions, so that enforcement is not possible as a practical matter.

The provisions in the draft permit that are the subject of this comment have not been included in the issued permit. As observed by this comment, the provisions are not developed sufficiently to be enforceable. In addition, they potentially conflict with the requirements for road cleaning to be performed with vacuuming, so as to potentially conflict with those requirements.

77. An applicant may not claim as "offsets" emission reductions that are otherwise occurring or required to occur. The offsets must be "surplus" emission reductions.[72] The proposed road cleaning offsets are also not surplus because US Steel is already required to conduct road sweeping under a production increase permit issued by Illinois EPA in 2002. The road sweeping program providing offsets for the proposed coke plant's emission increases would increase the sweeping on those existing roads and also expand to encompass additional roads.

The emission reductions for the Road Cleaning Program are surplus because they are additional reductions beyond those that are obtained by the current road cleaning program.

78. The proposed road cleaning offsets are also not surplus because the draft permit for the coke plant requires Gateway to pave or treat roads and parking lots.

The emission reductions for the Road Cleaning Program are surplus because they only address reductions on public roadways, not roadways and open areas on plant property.

79. The proposed road cleaning offsets are also not surplus because both the City of Granite City and the Illinois Department of Transportation (IDOT) also conduct street sweeping activities on nearly all of the roads that would be covered by the proposed offsets road sweeping program.[73] IDOT

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[72] More specifically, emission offsets "[m]ust not have been previously relied on, as demonstrated by the Agency, in issuing any permits … or for demonstrating attainment or reasonable further progress." Furthermore, "[e]missions reductions otherwise required by the Clean Air Act…shall not be creditable for purposes of any such offset requirement."

[73] The City of Granite City regularly sweeps all City streets with curbs and gutters, which include most of the City streets in the proposed road sweeping program. The City also has a substantial re-paving program, which will undoubtedly reduce PM loadings on the affected streets. Some of the roads in the proposed offset road sweeping program – Routes 162 and 203 – are state highways. IDOT regularly, and also on an as-needed basis, sweeps those highways.

also expects sources to clean the state highways that surround their operations. However, none of these pre-existing, non-offset, street sweeping or paving programs involves documentation of how much particulate matter is being removed. Therefore, Illinois EPA cannot determine how much PM is being removed under existing programs and thus subtract that amount from the portion of the sweeping that can be considered surplus and thus counted towards offsets. The road sweeping provisions are illusory and unenforceable, and cannot be used as offsets for the project's $PM_{2.5}$ emission increases.

As shown by other comments, governmental road sweeping programs that are directed at road safety and protection of storm drains but not control of particulate emissions should not be assumed to have a significant effect on controlling emissions of particulate from roadways. In addition, the amount of emissions reductions from the planned Road Cleaning Program was calculated from a baseline that reflected paved roads that are in good condition. The determination of the amount of emissions offsets does not take credit for routine activities by governmental bodies to maintain public roadways in good condition. As roads are cleaned that are not in good condition, such cleaning would provide additional actual reductions in emissions for which no credit would be taken.

80. The emission offsets for particulate matter must be such that "relative to the site of the proposed new or modified source, the location of the offset, together with its effective stack height, ensures a positive net air quality benefit. This shall be demonstrated by atmospheric simulation modeling…" USEPA's Offset Interpretative Ruling clarifies that "…when stack emissions are offset against a ground level source at the same site, modeling would be required." Here, stack emission offset against ground level sources, roads, located various distances from the plant, clearly requiring a modeling demonstration of positive net air quality benefit. No such modeling was presented to Illinois EPA by US Steel or Gateway. Illinois EPA should not issue a permit until such modeling has been done and demonstrates that a positive net air quality benefit will be achieved – with respect to $PM_{2.5}$ concentrations.

The USEPA's Emission Offset Interpretative Ruling is not relevant to the permitting of the proposed coke oven plant as this ruling addresses emissions of total suspended particulate (TSP) and predates control programs for both PM_{10} and $PM_{2.5}$. Moreover, even if one assumes that the Ruling is relevant, the situation for the proposed plant is the reverse of the situation being addressed by USEPA in the Ruling. USEPA expressed concern when the emissions of a proposed new or modified unit that would discharge at ground level might be offset by a unit with an elevated stack. This is presumably because of the disparity of dispersion, with the emissions of ground level units having a far greater impact on ambient air quality. In this case, existing units that emit at ground level, roadways, would be providing the emissions offsets for new units with stacks.

81. It is likely that modeling would not show a positive net air quality benefit. Furthermore, any air quality benefits that might occur from road sweeping would not occur at the same place as impacts from the coke plant project's emission increases.

As discussed above, given the differences in the heights at which emissions occur, modeling of the offsets would show a positive air quality benefit, on balance, for local air quality in Granite City. Moreover, emission offsets do

not have to directly cancel out the impacts of a proposed project. Applying the offset requirement of NA NSR in such a manner would effectively prohibit most major construction activity in nonattainment areas, as it would be extraordinary for emission offsets to be available that directly cancel out the impacts of a proposed source. In this case, it would effectively require emission offsets to be provided by an existing heat recovery coke plant located at the site where the proposed plant would be constructed. The role of emission offsets is to ensure that reasonable further progress towards attainment is maintained.

82. Local and regional transport of particulate matter is dependent on a number of factors, including particle size, discharge height, wind speed, humidity, and atmospheric stability. Dry deposition, or gravitational settling of particles out of the atmosphere, is highly dependent on particle size. The larger particles in road dust are suspended for only a short distance and settle out relatively quickly. Therefore, most of the PM_{10} road dust typically spreads only a short distance from the roads and contributes little to the regional background. In contrast, smaller particles emitted from combustion units with elevated stacks are distributed regionally.

The observations made in this comment are not directly applicable to PM_{10}, which is sufficiently fine that it does not rapidly settle out of the atmosphere. In any event, the comment confirms the localized benefits of the road cleaning program for air quality in Granite City.

83. Most of the people living in the greater St. Louis area will not benefit from reducing emissions by sweeping roads in Granite City. They will be adversely impacted from regional transport of direct and secondary $PM_{2.5}$ emissions from the coke plant. These emissions would not be offset by the proposed road sweeping offset program, as discussed in other comments. The permits should not be issued until Gateway demonstrates a positive net air quality benefit in the Greater St. Louis area.

The emission offsets from road cleaning are appropriate as they would involve reductions of direct emissions of particulate in Granite City, the location in the Greater St. Louis area where ambient concentrations of $PM_{2.5}$ are highest. Emissions of secondary or indirect $PM_{2.5}$ from the proposed plant are already "offset" as the proposed plant would not be accompanied by a significant net increase in emissions of either NOx or SO2, given accompanying decreases in emissions at the Granite City Works.

84. Emission offsets must be permanent. As proposed in the draft permit, they are not. Permanence "may generally be assured by requiring federally enforceable changes in source permits or applicable state regulations to reflect a reduced level of allowable emissions." However, there are simply too many uncontrollable variables in road sweeping to maintain that reduced level of emissions.

    The amount of emission reductions that can be achieved by road sweeping depends upon meteorological conditions (wind, rain), surrounding land use, season, the condition of the road shoulders and road surface, the amount of traffic, the presence of parked cars, traffic congestion during sweeping, the presence of nearby construction projects, vehicle speed, and the relative number and types of vehicles, among others.

These factors could vary over time in such a way that no reduction in emissions relative to pre-construction emissions would occur. The statistical nature of the equation coupled with the natural variability of the factors that determine paved road emissions makes it impossible to guarantee that any reductions would occur, let alone the precise amount of reductions required to offset the project's permitted particulate emissions.

The offsets from the road cleaning program are made permanent by requiring US Steel and/or Gateway, through the construction permit for the coke conveyance system, to maintain the road cleaning program and to show through periodic testing that the silt loadings after implementation of the road cleaning program (which are directly related to emission reductions) are being achieved. Should conditions change in the future and it is determined that the frequency of cleaning must be increased or enhanced in some other way to maintain silt loadings at the reduced levels, such measures would be required.

The factors cited in these comments would not affect the permanence of emission reductions. Occurrence of precipitation has already been taken into account in the calculation of emission reductions. Traffic volumes have been taken into account based on the levels of vehicles currently serving the Granite City Works. Changes in surrounding land use and road conditions can only affect silt loadings which are required to be periodically measured. The affect of seasonality can be addressed by conducting silt sampling during the summer, when salt or sand are not being applied to roadways. The presence of parked cars, traffic congestion and vehicle speed will have no affect on fugitive dust emissions from paved roads, when considered on annual basis. Should an increase in traffic occur on the roads being cleaned, fugitive dust emissions will be at a lower emission rate than if this program of cleaning is not implemented as an offset program. Wind has not been found to have an identifiable effect on fugitive dust emissions from paved roads, presumably because any effects are dwarfed by the air movement induced by vehicle traffic.

85. These various factors result in significant variability of achievable emission reductions. All of these variables can be reasonably expected to vary in the future, thus affecting the amount of emission reductions. For example, if the city installs curbs along road shoulders or road surfaces deteriorated, emission reductions from sweeping would decline. A construction project could close off one of the roadways, as actually occurred during the US Steel's road study. Parked cars could limit the efficiency of sweeping. Neither Gateway nor US Steel has the ability to control any of these factors. There is no way to assure permanence of claimed reductions.

As a general matter, the various factors identified in this comment do not show that the planned road cleaning program cannot be used to provide emission offsets for the proposed plant. Rather, they suggest that provisions should be included in the program that require periodic reevaluation to verify that the program is achieving the required reduction in emissions. This has been done in the issued permit. In addition, some of the factors identified by this comment would not adversely impact the effectiveness of the road cleaning program. For example, installation of curbing on streets should act to reduce silt loading on streets as less "washout" from shoulders will occur. Deterioration of roads may affect the ability of the applicant to clean the affected roads, however, the monitoring of silt loadings will ensure that if road deterioration affects the Permittee's ability to clean the affected roads, this condition is identified and a remedy is implemented. Road construction

would eliminate emissions from road segments working to reduce emissions from that road segment. This will not affect offsets generated. Parking on affected streets is not allowed except on two road segments (W. 20th St. and Rock Road) and will not affect cleaning of traffic lanes where emissions are generated.

86. Because of the difficulties presented with emission offsets from cleaning of roadways, emission offsets from road cleaning have not been allowed in emission trading programs.

The road cleaning program is not being used in the context of an "emissions trading program," in which the resulting emission reduction credits could be sold as a commodity in an allowance market. Rather, the road cleaning program is being used to obtain a specific reduction in emissions to offset a particular project that will occur in the same general area in which road cleaning is occurring.

87. Emission reductions created by sweeping paved roads are also not permanent because they are not under the control of the owner or operator of the emission increases that are being offset. Land use bordering these roads includes residential housing, vacant lots, and various commercial and industrial activities. Changes in surrounding land use could occur over time, changing the amount of loose material on adjacent road surfaces and thus affecting the amount of reductions actually achieved. Thus, there is no way to assure that any specific level of emission reduction will be achieved.

As previously discussed, changes in land use will not affect the permanence of emissions reductions. Additionally, the changes identified in this comment would only affect silt loadings on roadways, which would be controlled by the planned road cleaning program. Periodic measurements and actual silt loadings are required by the permit; enhancements and adjustments can be made to the Road Cleaning Program if necessary.

88. Emission reductions created by sweeping paved roads are also not permanent because a key factor in assuring that reductions are maintained is the amount of traffic on the subject roadways, as emission reductions are calculated by multiplying small numbers, the emission factors in lb/VMT and the distance in miles, by a large number, the daily traffic volume. US Steel argued that it should not be responsible for changes in traffic levels on public roads.[74] These comments illustrate why road sweeping should not be allowed to offset emissions of the proposed plant. Neither US Steel nor Gateway has control over traffic, the factor that primarily determines the magnitude of the credits.

The Road Cleaning Program provides permanent reductions in emissions as the road cleaning program itself is permanent. For purposes of quantifying the reduction in emissions from the planned program, it reasonable to rely on authoritative measurements of traffic volume. Traffic volume in an urban area is not so variable that is not appropriate to rely on the occurrence and volume of vehicle traffic on major roadways. As previously mentioned, this is

[74] US Steel stated that "US steel believes that to maintain emission credits and to offset emissions as proposed, US Steel should only be responsible for reducing silt loading on road segments and that changes in traffic levels on public roads should not affect offsets. Traffic levels on Granite City streets and State highways included in the program can and will change independent of the operations at the facility."

consistent with USEPA's approval of the Maricopa County Arizona SIP provision allowing emission offsets to be generated by the paving of unpaved roads. Moreover, this SIP rule bases emission offsets on baseline traffic data for the affected road segments. Offsets are calculated based on the baseline average daily traffic data and subsequent increases in traffic levels have no affect on the permanence or quantity of the offsets generated. Given the precedent set by USEPA in this regard, US Steel may be correct that it should not be held responsible for changes in traffic levels on the roadways covered by the road cleaning program as related to emission offsets. However, this may not hold true in the context of attainment of the $PM_{2.5}$ NAAQS.

89. The draft permits would not provide conditions to assure permanence of emissions reductions. The effectiveness of sweeping, for example, depends on the type of sweeper, the speed at which it operates, and the number of passes. The Conveyance Draft Permit requires vacuum sweeping "using filter sweeping equipment such as Enviro-Whirl or Tennant vacuum sweepers," but nothing more. These companies offer a variety of sweeper models with a wide range of particle removal efficiencies.

In response to this comment, the issued permit requires records to be kept documenting the type of equipment and the procedures that are used for the cleaning of roads. In addition, the issued permit only identifies the Enviro-Whirl sweeper as an example of a acceptable sweeper, as Tennant makes a variety of sweepers not all of which would be suited to a road cleaning program that is aimed at reducing emissions of fugitive dust from roadways.

90. The road sweeping program to provide emission offsets, as set out in the draft permit for the conveyance system, would be flawed because sweeping would only be required either twice weekly or twice monthly, depending upon the particular road segment. This is too vague to assure effective sweeping as all sweepers are not created equal. Many sweepers have very low collection efficiencies for fine particulate matter. US Steel would not even be required to conduct a road study to discover whether any type of sweeper could provide a meaningful reduction in $PM_{2.5}$.

US Steel has already performed a study and determined that the reductions in emissions needed from the road cleaning program are achievable with the type of road cleaning equipment that will be used for the current road cleaning program. If the type of road cleaning equipment changes significantly, in a way that could adversely affect the amount of silt that is collected from roadways by cleaning at the specified frequency, a reevaluation of the effectiveness of the program can be required by the Illinois EPA.

91. The road sweeping program to provide emission offsets, as set out in the draft permit for the conveyance system, would be flawed because it would be based on AP-42 baseline calculations performed based on estimates and not actual data. This is made worse because future testing is not required to verify the propriety of that baseline calculation through periodic silt testing or any other road study focusing on the impact of key factors such as varied locations, surrounding land use, road surface condition, shoulder condition, or traffic level and type.

The discussed, the emission reductions required of the road cleaning program are based on actual measurements of silt loadings on the roadways that would be covered by the program. In addition, as suggested by this comment, periodic measurements of silt loadings on roadways is required by the issued permit. Other road studies are not required to show offsets have been achieved.

92. The road sweeping program to provide emission offsets, as set out in the draft permit for the conveyance system, would be flawed because it would not include a map that identifies the road segments that would be cleaned and address other important elements of the road dust control program, including: (1) Specific cleaning method(s) to be used, such as flushing and/or sweeping; (2) The sweeper $PM_{2.5}$ control efficiency; (3) The frequency of cleaning; and (4) The requirements for recordkeeping and reporting. Without these elements, the proposed offset program would not enforceable by any party.

In response to this suggestion, the issued permit includes certain enhancements for the road cleaning program, to facilitate enforcement of the program. Maps are included as attachments to the permit, in addition to the narrative listing in the body of the permit of the road segments covered by the program. Recordkeeping requirements are included to define the measures that are being implemented to clean road segments and to verify implementation of those measures. The permit already established the initial frequencies for cleaning of different road segments, i.e., either bi-weekly or bi-weekly, depending upon the volume of traffic on the road segment. It is not appropriate or necessary for the permit to establish explicit requirements for sweeper $PM_{2.5}$ control efficiency as the road cleaning program does not directly control $PM_{2.5}$ emissions, it reduces the levels of silt on roadways, which is the origin of fugitive road dust.

93. A small portion of the $PM_{2.5}$ offsets (31.74 tons/year) are based on SO_2 reductions attributable to desulfurization of coke oven gas by US Steel. The amount of SO_2 reductions was apparently based on modeling the impact of the SO_2 reductions on $PM_{2.5}$ concentrations in the area. However, the impact of the SO_2 reductions on 24-hour $PM_{2.5}$ concentrations was not considered, for which the area also violates the revised 24-hour NAAQS adopted by USEPA in 2006. Given that the area does not meet the 24-hour $PM_{2.5}$ NAAQS, the proposed coke plant should not be allowed to exacerbate this problem. In its guidance, USEPA encourages permitting authorities "… to be mindful of the strengthened 24-hour standard as they adopt emission reduction strategies to attain the 1997 standard."

The emission offsets for the proposed plant do not include any reductions in SO_2 emissions from the facility that will be constructed to remove sulfur from the coke oven gas from the existing byproduct coke plant at the Granite City Works. The reduction in emissions that will result from this new facility, which would be used as an emission offset is the reduction in emissions of sulfuric acid mist, which will accompany the desulfurization of coke oven gas. Sulfuric acid mist is a component of condensable particulate, so that the reduction in sulfuric acid mist emissions is a direct reduction in particulate emissions.

Confusion on this point is understandable because US Steel and Gateway were initially considering using reductions in SO_2 emissions to provide offsets for particulate matter emissions. However, the modeling that was performed, which included atmospheric chemistry to address the rate at which SO_2 would convert into particulate sulfate in the atmosphere, showed that the local reduction in particulate emissions would not be sufficient to provide the needed offsets for the proposed plant. This is because in the atmosphere conversion of SO_2 to sulfate is a gradual process, so that a reduction in SO_2 emissions must be many times the reduction in particulate emissions to have the same effect on local air quality. Accordingly, while US Steel's new coke oven gas desulfurization facility will generally act to improve air quality, US Steel and Gateway looked

elsewhere to obtain emission offsets for the proposed plant.

Incidentally, the USEPA guidance cited by this comment was directed at state and local governments as they are engaged in developing attainment strategies. It does address permitting. Moreover, the guidance makes the obvious point that if an area exceeds both the 24-hour and annual NAAQS for $PM_{2.5}$, attainment strategies should be developed in a coordinated manner to efficiently bring the area into compliance with both standards.

94. Additional or substitute offsets should be required by the permits for the proposed coke plant project. In 2004, the most recent year for which an annual emissions report was made available to me, US Steel reported that the Granite City Works emitted 536 tons of $PM_{2.5}$ and 5,971 tons of SO_2. Illinois EPA could require US Steel to perform a study of the Granite City Works to identify opportunities to reduce $PM_{2.5}$ emissions that would qualify as valid offsets.

This information does not demonstrate that emission offsets could be readily obtained from the operations at the existing Granite City Works. In particular, the emissions of SO_2 will be controlled by the new coke oven gas desulfurization facility and would not provide the needed reductions in particulate emissions locally, in the vicinity of Granite City. Particulate emissions from existing process emission units are already controlled. Accordingly, the installation of additional controls would not provide significant reductions in particulate emissions, considering that the reduction would be based on the actual further reduction in emissions, as needed to offset the permitted emissions of the proposed coke plant. In these circumstances, it is appropriate for the Illinois EPA to rely on the applicant to identify the sources of emission offsets based on its detailed knowledge of its operations and the feasibility of committing to even lower levels of emissions in the future.

95. There are a number of potential options to reduce $PM_{2.5}$ emissions at the existing Granite City Works, notably at the existing coke batteries.[75]

While the potential options for emission offsets suggested by this comment would certainly be desirable actions on the part of US Steel, they would not provide the needed emission offsets for the proposed coke plant. In particular, the emissions of the existing coke oven batteries are tightly regulated by a collection of emission standards, including several different NESHAP standards. The levels of emissions are currently not such that the various improvements in operating practices suggested in the comments would provide significant reductions in the mass of particulate emissions. The casthouse at the blast furnaces is already controlled by two baghouses. The Basic Oxygen Furnace is already controlled with a large ESP. Improvements in

[75] Potential options to reduce PM2.5 emissions at the existing Granite City Works include: (1) controlling leaks from doors, lids, and offtakes during coking; (2) preventing leakage of coke oven gas through oven walls into the flue system; (3) minimizing the frequency of green pushes; (4) using hoods exhausted to baghouses (or upgrading such existing systems) to capture emissions that occur during blast furnace tapping and charging; (5) adding and/or upgrading electrostatic precipitators; (6) increasing the capture of emissions from hot metal transfer, desulfurization, and stag skimming; (7) enlarging existing baghouses; (8) installing bag leak detection systems; (9) improving operational practices, including extensive worker training on door cleaning, sealing, lid operation, pollution control device management, etc.; and (10) using post-process control devices to reduce PM2.5 and its precursors, including flue gas desulfurization, wet electrostatic precipitators, agglomerators, and baghouses.

compliance procedures with enhanced monitoring would not readily provide real reductions in emissions without significant risk to US Steel of future noncompliance. The only potential source of emission offsets at the Granite City Works worthy of serious consideration would be control of emission of coke oven gas, as this could potentially provide the offsets needed by the proposed coke plant. However, the concentration of filterable particulate emissions from coke oven gas combustion must already be less than 0.075 lb/million Btu, as limited by 35 IAC 212.458(B)(9). Further control from this starting point would be costly.

96. As a major project subject to NA NSR for PM_{10}, Gateway and US Steel were required to provide an alternatives analysis to demonstrate that the benefits of the coke plant project "outweigh the environmental and social costs imposed as a result of its location, construction, or modification, based upon an analysis of alternative sites, sizes, production processes, and environmental control techniques for such proposed source." Neither Gateway nor US Steel has satisfied this requirement.[76] In addition, they have not addressed the alternative of shutting down of the existing, old coke plant and replacing it with a new, larger coke plant. Nor did they discuss the alternative of adding more aggressive pollution controls on the existing coke plant. Illinois EPA cannot issue permits unless and until Gateway and US Steel provide alternatives analyses that satisfy the requirements of 35 IAC 203.306.

In response to this comment, Gateway and US Steel have been required to provide analyses of alternative that satisfy 35 IAC 203.206. This comment does not show that the "alternative" source of emission offsets suggested by this comments is an appropriate element of those analyses, as the focus of such an analysis is on alternatives to the proposed major project. Likewise, it is unclear whether construction of a larger heat recovery coke plant is properly considered to be an alternative to the proposed coke plant or an alternative to the continued operation of the existing byproduct recovery coke plant.

97. requirement of NA NSR is that the applicant must demonstrate that all major sources that it owns and operates in the State of Illinois are in compliance, or on a schedule of compliance, with all applicable federal and state air pollution requirements. Neither Gateway nor US Steel addressed this requirement in their applications, although both companies are aware of a longstanding air pollution enforcement action pending in the Illinois courts regarding violations at the Granite City Works.

This requirement was appropriately addressed in the applications for the coke plant project and was resolved before the permits for the project were issued. In particular, on December 18, 2007, a Consent Order was issued to US Steel that established a compliance schedule for historic violations of emission standards at the Granite City Works. (See: People of the State of Illinois v. United States Steel Corporation, Inc., Illinois 3rd Circuit, No. 5-CH-750.) US

[76] In April 2007, Gateway submitted a two-page document entitled Analysis of Alternative Sites. In fact, the document contains no such analysis. It does nothing more than explains its interest in the Granite City site. It mentions not one other possible site. It does not address other production processes or environmental control techniques. It does not even consider the possibility of building this plant in an area that does not already violate the PM2.5 NAAQS. Although Gateway highlighted the financial advantages of building the plant in Granite City, including the ability to take advantage of US Steel emissions decreases in order to avoid substantial NSR requirements – it neglected to note that the Granite City Works is already a major contributor to the area's nonattainment status.

Steel subsequently certified compliance with the terms of this Order.

98. To the best of my knowledge, Gateway completely ignored the compliance demonstration requirement. This supports the point, made in other comments, that Gateway and US Steel are not under common control. The NA NSR rules state that the compliance demonstration applies to "all major stationary sources which he or she [the applicant] owns or operates (or which are owned or operated by any entity controlling or controlled by, or under common control, with the owner or operator)." 35 IAC 203.305. Although Gateway is willing to claim that it is under common control with US Steel for purposes of relying on US Steel's emission decreases for purposes of determining applicability of NSR, it is keeping its distance with respect to claiming credit for US Steel's outstanding violations.

Contrary to the assertion in this comment, Gateway proceeded in a reasonable manner that is consistent with its relationship with US Steel. Gateway does not currently operate any major sources in Illinois. Gateway is engaged in undertaking a future venture, a heat recovery coke plant, for which control would be shared with US Steel. As such, Gateway is not obligated to address the compliance status of the existing Granite City Works. As US Steel has a controlling role in the development and operation of the proposed project, it was required to address its existing compliance status, which it did. Moreover, as US Steel has a controlling role in the project, appropriate resolution of outstanding violations by US Steel was a prerequisite for issuance of the permits that allow the coke oven plant project to proceed. This occurred on December 18, 2007, with the issuance of a Consent Order.

99. US Steel mentioned the existing source compliance requirement in its application for the coke conveyance system, but stated that it would submit its compliance demonstration under separate cover. I have been unable to locate any such compliance demonstration.

US Steel has supplemented its application with its compliance demonstration. The compliance demonstration could not be submitted before the Consent Decree was entered on December 18, 2007, as this Decree establishes a compliance schedule for certain violations that were otherwise unresolved.

100. The Project Summary for the coke conveyance system acknowledges the existence of ongoing litigation[77] and states that the outstanding violations "would have to be resolved before a construction permit could be issued." The draft permit was prepared on the basis that this would occur before any permit would be issued.[78] This approach deprives the public of the opportunity to comment meaningfully on the draft permit. Moreover, the manner in which this requirement would be addressed – "trust us, we'll take care of it" – belies the seriousness of the requirement. This is no minor matter. Accordingly, Illinois EPA should impose conditions in the permits requiring US Steel to cure these longstanding violations before construction commences on the proposed coke plant.

The approach that has been taken to this existing source compliance requirement of NA NSR is consistent with applicable state law. As stated in the Project

[77] Illinois initiated an enforcement action against US Steel over two years ago for air pollution violations and submitted two updated complaints adding further violations.
[78] Condition 2.8 of the draft permit states that US Steel has demonstrated that its sources are in compliance or on a schedule for compliance.

Summary, at the time the draft permit was prepared, US Steel was not in full compliance and this noncompliance was the subject of an enforcement activity being handled by the Office of the Illinois Attorney General. State procedures for resolution of civil enforcement actions do not provide the public with an opportunity to comment on a draft consent decree prior to it being entered by a state court. In these circumstances, it would not be appropriate for the Illinois EPA to independently solicit comments on the draft decree in a separate permit proceeding.

Moreover, the Clean Air Act does not provide that the public is to have an opportunity to comment on ongoing enforcement actions when a person proposes a major project in a nonattainment area. Section 172(a)(3) of the Clean Air Act merely requires that the permit applicant address its existing major sources by showing that they are in compliance or on a program to come into compliance.[79] In the case of the Granite City Works, this requirement has clearly been beneficial as it accelerated the conclusion of the enforcement action and the entry of the Consent Order.

101. Section 39(a) of Illinois' Environmental Protection Act invites Illinois EPA to consider an applicant's prior compliance history when evaluating all permit applications, and to "impose reasonable conditions specifically related to the applicant's past compliance history … as necessary to correct, detect, or prevent noncompliance."

For the proposed coke plant project, the issued permits for the project, which narrowly focus on the project, are not an appropriate means to broadly address and correct compliance issues at existing emission units at the Granite City Works. As noted by the comment, alleged violations by existing units at the source have been the subject of an enforcement action, which was resolved on December 18, 2007, with the issuance of a Consent Order. As compared to conditions imposed in a construction permit for unrelated emission units, this order, whose development was coordinated by the Illinois Attorney General's Office, is the preferable means of establishing the specific measures that must be implemented to address the various alleged violations at this source.

102. The proposed coke plant will have the potential to emit 234.10 ton/yr of PM_{10}.[80] Most of this particulate matter would be $PM_{2.5}$.

This claim, which was not supported by any factual information, is highly questionable. USEPA has published emission factors for <u>byproduct</u> recovery coke ovens, based on data from the 1970s, that would indicate that the particulate matter emissions from those plants are mainly $PM_{2.5}$. However, USEPA has not developed similar factors for heat recovery coke plants, like the proposed plant. The nature of their particulate matter emissions is distinguishable from those of byproduct recovery plants given differences in the design of heat recovery coke plants. In particular, as emissions of SO_2 are controlled after combustion, the SO_2 control system also contributes to the permitted particulate

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[79] **"…the owner or operator of the proposed new or modified source has demonstrated that all major stationary sources … in such State are subject to emission limitations and are in compliance, or on a schedule for compliance, with all applicable emission limitations and standards under this Act;" Section 173(a)(3) of the Clean Air Act.**

[80] The breakdown of the potential annual PM10 emissions is: Charging - 8.06 tons; Main stack - 124.00 tons; Individual waste heat stacks - 30.24 tons; Pushing -31.41 tons; Quenching - 24.09 tons; Coal/coke handling - 3.32 tons; Coke crushing and screening - 9.39 tons; Roads -3.13 tons; and Conveyor System - 0.45 tons.

emissions of the plant.[81] This greatly increases the loading of larger particles as particles are generated by the SO_2 control system. At the same time, as all emissions from the coking process, other than during bypass, occur through the main stack, particulate matter emissions are controlled by filter technology.

103. The coke plant project will be subject to the requirements of PSD for PM_{10} and NA NSR for $PM_{2.5}$, so the particulate emissions of the various emission units at the plant must use Best Available Control Technology (BACT) for PM_{10} and meet the Lowest Achievable Emission Rate (LAER) for $PM_{2.5}$. The coke plant application variously addresses these requirements in several places.[82] My review of this information indicates the resulting BACT and LAER determinations fail to identify BACT and LAER due to a number of fundamental errors in the analysis, discussed below.

In the issued permits, BACT and LAER are appropriately established for the particulate emissions for each emission unit that is part of the proposed coke plant. In this regard, comments did not identify any fundamental errors in the BACT and LAER determinations in the draft permits. However, comments did identify several ways in which the BACT and LAER determinations for certain units could be tightened. Accordingly, as compared to the issued permit, the draft permit sets lower limits for particulate matter emissions from the main stack. It also includes additional work practice control requirements to minimize particulate emissions during certain maintenance of equipment, when emissions of the coking process would only be controlled by the inherent design of a heat recovery coke battery, including the afterburner tunnel systems.

104. LAER technology is required to control emissions of $PM_{2.5}$. The BACT and LAER analyses in the application do not address $PM_{2.5}$, but rather use PM_{10} as a surrogate for LAER, tacitly assuming LAER for PM_{10} and $PM_{2.5}$ are equivalent. For each emissions unit, the Illinois EPA first presents what it proposes as BACT for PM_{10}. Then, Illinois EPA states that BACT for PM_{10} is also LAER for PM_{10} because "there are no more stringent rules or limits achieved in practice by heat recovery ovens."[83] This surrogate approach is not valid because USEPA has adopted a separate NAAQS for $PM_{2.5}$, as discussed in other comments.

The adoption of a NAAQS for $PM_{2.5}$ does not address or solve the technical issues that would be posed for the proposed coke plant to make determinations of LAER in terms of $PM_{2.5}$ nor does the comment show that a LAER limit to address emissions of $PM_{2.5}$ cannot be appropriately be set in terms of emissions of PM_{10}. First, the use of surrogate pollutants, one pollutant to serve in place of another pollutant or a family of pollutants, is a commonly accepted approach to

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[81] **Particulate generated by the spray dryer absorber originates from a mechanical process, i.e., the grinding of raw lime, so that the size of individual lime particles, after the water in the droplets of slurry evaporates can vary in size from 2 to 50 microns. Accordingly, at most a small fraction of its emissions should be PM2.5.**

[82] As related to technology for control of emissions, The application for the proposed coke plant includes (1) the original application, submitted in July 2006 (which discusses pollution controls, but does not contain either a BACT or LAER analysis that is identifiable as such); (2) Revision 1, submitted in October 2006 (which contains a top-down BACT analysis for PM10); (3) Addendum 2, submitted in January 2007 (which contains a LAER analysis for PM10); and (4) Addendum 4, submitted in July 2007 (which discusses BACT and LAER for spray drier/baghouse maintenance).

[83] The draft permit for the coke plant permit states, "For purposes of nonattainment New Source Review (NA NSR) regulations, PM10 serves as a surrogate for PM2.5, consistent with current USEPA guidance."

establishment of emission limits. For example, limits for total filterable particulate matter (as measured by USEPA Method 5) are routinely used by USEPA to set emission standards for HAP metals that are emitted as particulate matter. Second, PM_{10} is more than a surrogate for $PM_{2.5}$ because $PM_{2.5}$ is a subset of PM_{10}. Thus, any limit for emissions of PM_{10} also serves to limit emissions of $PM_{2.5}$. Third, a body of emission data in terms of $PM_{2.5}$ does not exist, nor does this comment suggest that a body of data exists, to support a determination of LAER that is expressed in terms of $PM_{2.5}$. Information on emission limits that have been or could be achieved for a pollutant on other similar or comparable units with different control technologies is essential to evaluate the limit that should be set as LAER for a proposed unit. Fourth, USEPA has not adopted a reference test method for measuring emissions of $PM_{2.5}$. This is needed to provide consistency in the body of emission data that is the basis for the limit selected as LAER. It is also needed to provide a reliable, authoritative method for a definitive determination of compliance with any limit that is set. None of these technical issues has been solved by the adoption of an air quality standard for $PM_{2.5}$, for which sampling of the ambient air is conducted using the "Reference Method for the Determination of Fine Particulate Matter as $PM_{2.5}$ in the Atmosphere," 40 CFR 50 Appendix L.

105. It is not appropriate to use PM_{10} as a surrogate for PM_{10} because PM_{10} and $PM_{2.5}$ are different pollutants with distinguishable properties, requiring separate controls. LAER for PM_{10} and $PM_{2.5}$ are not equivalent because the performance of many pollution control devices depends directly upon particle size. In general, smaller particles are more difficult to remove than larger particles and thus require different control devices. In identifying control measures as PM_{10} LAER, Illinois EPA failed to consider this particle size difference and thus failed to consider control measures that would be more effective at controlling $PM_{2.5}$ than PM_{10}.

While separate NAAQS have been set for PM_{10} and $PM_{2.5}$, it does not follow that fundamentally different pollution control technologies are required to control PM_{10} and $PM_{2.5}$. As noted by this comment, smaller particles are generally more difficult to remove from an exhaust stream than larger particles.[84] In addition, condensable particulate is a component of both PM_{10} and $PM_{2.5}$. Accordingly, lower emission rates and improved performance of control devices for PM_{10} by necessity require more effective control of the smaller particles that are present in the exhaust stream. Further, as the proposed plant is subject to BACT and LAER for particulate, which requires a case-by-case determination of the lowest emission limits that are achievable and the maximum degree or reduction of emissions, the most stringent control of particulate was the direct focus of the control technology determination.

106. The fact that PM_{10} controls do not provide effective controls for $PM_{2.5}$ emissions has been specifically recognized by the EPA, which stated in its April 2007 $PM_{2.5}$ implementation rule that, "… in contrast to PM_{10}, EPA anticipates that achieving the NAAQS for $PM_{2.5}$ will generally require States to evaluate different sources for controls, to consider controls of one or more precursors in addition to direct PM emissions, and to adopt different control strategies." Rather than pretending that the

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[84] **This principle does not apply for very fine particles, in the range of one micron or less, for which performance of a control device may be better for the finest particles than the less fine particles based on the physical mechanisms that apply to different size particles and determine the performance of the control device, e.g., impaction, electrostatic attraction, and Brownian movement.**

controls for PM_{10} will suffice for $PM_{2.5}$, Illinois EPA must conduct a LAER analysis specifically for $PM_{2.5}$.

The comments of USEPA cited in this comment address the development of attainment demonstrations for $PM_{2.5}$, not permitting of proposed new emission units. Moreover, it is unclear how the cited USEPA comments are relevant, as coke plants are sources that were considered for control in attainment demonstrations for PM_{10} and are not "different sources." In any case, the comments do not state that control devices for PM_{10} emissions do not provide effective control of emissions of $PM_{2.5}$. They also do not support the premise that the LAER analysis for particulate emissions of the proposed plant was improperly performed because it evaluated emission rates in terms of particulate measured as PM_{10} and focused on performance of filtration technology for control of filterable particulate.

107. A LAER analysis for $PM_{2.5}$ must consider methods to enhance the removal of these finer particles. One method to enhance the control of emissions of fine particulate would be use of a baghouse filtration media with a high removal efficiency for fine particles smaller than 10 microns. Fabric filters or baghouses are only as efficient as their filter media. The filter media determines the control efficiency of a baghouse for various particles sizes. There is a wide range of media that can be used, most of which are more efficient for larger particles, 10 microns and up. However, media have been developed over the last decade that remove over 99.9+ percent of 2.5 micron particles.[85] The BACT/LAER analyses do not identify the type of filtration media that would be used nor the removal efficiency as a function of particle size, which is required to determine if LAER for $PM_{2.5}$ has been required. Thus, the LAER analyses for coal charging, the main stack and coke crushing and screening, which are controlled with baghouses, are per se defective. In sum, the BACT/LAER analysis did not consider all of the available technologies that are feasible to reduce $PM_{2.5}$ emissions. Much lower $PM_{2.5}$ emission rates can be achieved than proposed here as BACT and LAER by using more efficient baghouses, equipped with filtration media such as Teflon®.

While this comment is based on a number of misconceptions about filtration technology, the comment does raise the valid question whether scrutiny of filter material could enable more stringent BACT/LAER limits to be set for certain units at the proposed plant. Accordingly, the Illinois EPA has expanded its BACT and LAER analysis to consider use of advanced filter media as discussed by this comment. Based on this further consideration, the issued permit requires use of an "advanced" filter media[86] in the baghouse for the main stack, which would be controlling an exhaust stream that includes combustion particulate, as well as lime particulate from the dry scrubber absorber. The permit does not require that a specific type of advanced filter media be used,

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[85] Example of such filter media include Daikin's AMIREXTM, PTFE membrane filters and W.L. Gore's L3650.

[86] **Condition 4.1.5(b)(i)(E) of the permit requires "The filter material in the filter system for the main stack shall be a membrane material, micro-fiber material, micro-fiber capped composite material or other similar filter material that has enhance performance for collection of fine particulate as compared to conventional woven or felt filter material." It also requires that the filter material have been demonstrated "… to provide at least 99.99 percent reduction in emissions of filterable PM2.5 (an outlet emission rate of no more than 0.0008 gr/scf), as determined by ASTM Standard D6830-02, Characterizing the Pressure Drop and Filtration Performance of Cleanable Filter Media, or other similar methodology used by USEPA's Environmental Technology Verification program for evaluation of filter materials."**

as the selection of filter media must also consider other factors in addition to performance for control of particulate.[87, 88] For example, the successful use of a membrane-type filter media depends upon maintaining the integrity of the thin membrane applied to the surface of a fabric substrate. In addition, at the request of Gateway, the permit also includes specification for the performance of the selected filter fabric as measured by a laboratory using a standardized analysis method for such measurements.[89] As measured by such methodology, the filter fabric must be demonstrated to have a removal efficiency for particulate, measured as $PM_{2.5}$, of over 99.99 percent.

In conjunction with these further requirements, a lower BACT/LAER limit is set for the main stack for filterable particulate, at 0.005 gr/scf, which is lower than the limit in the draft permit. The permitted particulate emissions from the main stack are also lower.[90] The limit for the main stack proposed in the draft permit, 0.008 gr/scf, was based on tested emissions at the existing Haverhill plant with a reasonable margin of compliance to account for normal variation in operation. However, that testing reflected a baghouse with conventional filter material, consistent with a plant that was designed and constructed a number of years ago. With improvements in filter media, it is reasonable to set a lower limit for the main stack that incorporates such improvements. For this purpose a limit of 0.005 gr/scf has been selected, based on the premise that half of the particulate from the main stack can be attributed to the filter media in the baghouse.[91] The selected limit is significantly more stringent than the proposed limit. At the same time, this limit is still supported by the tested emission rate at Haverhill, as it would still apply a compliance margin to that test result. However, this compliance margin is smaller as improved filter media should act to reduce variability in

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[87] USEPA discusses factors that should affect selection of the filter fabric for a baghouse in its ***Operation and Maintenance Manual for Fabric Filters***, EPA/625/1-86/020, June 1986. Technical factors that are identified as important include dust penetration, typical and maximum operating temperatures, chemical degradation, abrasion resistance, and cake release properties.

[88] The importance of appropriate selection of filter media for durability is confirmed by USEPA's Environmental Technology Verification (ETV) Program. When providing the results of such assessments for filter media, the USEPA notes that its verification statements address certain aspects of media performance, such as filter outlet particulate concentrations and weight gain on the filter sample. It goes on to note that "Users may wish to consider other performance parameters, such as temperature, service life and cost when selecting a filter fabric for their application."

[89] The efficiency of the filter fabric must be measured by the methodology used by USEPA's Environmental Technology Verification program for evaluation of filter fabrics, i.e., USEPA's "Generic Verification Protocol for Baghouse Filtration Products," or other similar standardized methodology for such measurements.

[90] In the issued permit, the BACT/LAER limit for filterable particulate is 0.005 gr/scf, rather than 0.008 gr/scf as proposed in the draft permit. The BACT/LAER limit for total particulate is also adjusted to account for this, being set at 0.011 gr/scf, rather than 0.014 gr/scf. The permitted emissions of particulate of the main stack are 33.7 tons/year lower than would have been allowed by the draft permit.

[91] Of the filterable particulate emissions that would have been allowed by the draft permit, 0.008 gr/scf, it is presumed that 0.004 gr/scf would be attributable to the filter media and 0.004 gr/scf would be attributable to other factors that affect the performance of the baghouse. The use of an enhanced filter media can reasonably be relied upon only to reduce the contribution to emissions related to the filter media itself. For this purpose, it is assumed that the contribution of the filter media to emissions will be reduced 0.001 gr/scf, a 75 percent improvement. The resulting limit for filterable particulate is 0.005 gr/scf (0.001 + 0.004 = 0.005).

the normal performance of the baghouse on the main stack.[92]

However, this comment is based on a flawed understanding of filtration technology as it presumes that the performance of a filter control device is directly determined by the performance of the filter media. However, a number of other factors are also present that have an equal if not greater role in the performance of a filter control device in practice, especially over the life of a set of filter bags.[93] Because of these factors, an "enhanced" filter material should not be presumed to provide the improvement in the performance of a filter control device as implied by this comment. Conventional filter media are also rated to provide 99.9 percent control of particulate when samples of the material are tested by themselves under laboratory or ideal conditions. In addition, the comment incorrectly implies that the availability of advanced fabric filter media is a consideration only for the LAER determination for the proposed plant. However, as such materials are currently available and would enable a lower limit to be set for particulate, the use of such material is a relevant consideration for the determination of BACT, as well as LAER. Accordingly, this comment did not identify a deficiency in the overall approach to LAER for the proposed plant, but a specific aspect of the LAER/BACT determination for the plant that could be and has been made more stringent.

Incidentally, the BACT/LAER limit in the issued permit for the baghouse for coke screening and crushing has also been lowered to 0.005 gr/scf for filterable particulate. However, this is a correction of an error in the draft permit. Gateway had proposed a limit of 0.005 gr/scf in its application, as is appropriate for an emission unit that mechanically processes a material.

108. Another method to enhance the control of emissions of fine particulate would be use of a wet electrostatic precipitator. A wet electrostatic precipitator (wet ESP) placed after a baghouse would eliminate significant amounts of $PM_{2.5}$ emissions. The USEPA and others have recognized that wet ESPs reduce $PM_{2.5}$ emissions. Indeed, "…the wet ESP is the ultimate device capable of … removing ultrafine particles. Many industries are considering the wet ESPs as the maximum achievable control technology (MACT)." Examples of power plants using wet ESP technology include: (1) Xcel Energy, Sherburne County, Units 1 and 2; (2) First Energy, Mansfield, Unit 2; (3) Duke Power, Cliffside, Units 6 and 7; (4)

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[92] **At the Haverhill plant, the tested emissions of the main stack were 0.0023 gr/scf of filterable particulate. The proposed limit in the draft permit, 0.008 gr/scf, would have allowed more emissions, providing a margin of compliance that is reasonable given the nature of baghouses and testing for particulate matter emissions. The limit in the issued permit, 0.005 gr/scf, is still higher than the tested emissions at the Haverhill plant. However, the limit is closer to the tested emission rate, so it provides a smaller margin of compliance as compared to the tested emission rate.**

[93] **The theoretical performance of the filter media is only one element in the performance of a filter control device. First, "leaks" in the structure of the filter device and the fittings attaching the filter bags to the tube sheet can let some exhaust pass around the filter media. Second, the performance of a filter device over time is significantly affected by the gradual development of isolated points of deterioration or failure of the filter media, such as so-called thin spots or pinhole leaks, or deterioration of other aspects of the filter device. Third, the durability and physical make-up of the filter media is important as related to the conditions of the exhaust to which the filter media is exposed. Improper selection of filter media can accelerate wear of the filter media due to abrasion, thermal and chemical effects, and physical stress and wear, greatly accelerating the localized failures that affect actual, overall performance of a filter device in practice. Accordingly, the performance of a sample of filter media under laboratory conditions should not be expected to be represent the actual performance of filter devices in which such media is installed.**

AES, Deepwater; and (5) New Brunswick Power, Coleson Cove.

The use of wet ESPs on coal and/or petroleum coke-fired utility boilers, as cited by this comment, does not show that this technology is appropriately applied to the proposed plant or would provide additional reductions in particulate emissions. In the past, wet ESPs have been occasionally installed on solid fuel-fired utility boilers for plant specific reasons.[94, 95] Recent interest in wet ESPs focuses on their ability to control emissions of sulfuric acid mist, which can be significant when a wet scrubber is used to control SO_2 emissions and which can be exacerbated by use of selective catalytic reduction (SCR) to control emissions of NOx. The factors that lead to use of wet ESP technology would not be present at the proposed plant. Given the concentration of SO_2 in the exhaust, which is similar to that of a boiler firing low-sulfur Western coal, dry scrubbing with a spray dryer absorber provides excellent control of SO_2 emissions and minimizes formation of sulfuric acid mist.

109. Another method to enhance the control of emissions of fine particulate would be use of an agglomerator upstream of the baghouse. An agglomerator uses electrical charges to attach smaller particles to larger particles, which are then more efficiently removed by a downstream particle collection device such as a baghouse or ESP.[96]

Agglomeration is a technology that has been developed to enhance the performance of existing ESPs, typically on coal-fired power plants.[97] This is shown by the circumstances in which it has been installed.[98] The development

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[94] **For example, the wet ESPs on Units 1 and 2 at Xcel Energy's Sherburne County Station are reported to have replaced the Venturi scrubbers that were originally installed, which were designed to control both SO2 and particulate. However, the Venturis were unable to adequately control particulate matter emissions from burning low-sulfur Powder River Basin coal. Accordingly, the mist eliminators for the Venturi scrubbers were replaced with tubular wet ESPs as it was found to be the low cost alternative. This new control configuration in practice reportedly achieves about 70 percent control for SO_2 and a particulate matter emission rate of about 0.005 gr/scf. Available information suggests that Xcel is now considering replacing the wet ESPs on Units 1 and 2 with baghouses.**

[95] **The wet ESP on AES Deepwater in Pasadena, Texas addresses emissions of sulfuric acid mist for this unit equipped with a wet scrubber that burns petroleum coke. The wet ESP is reportedly designed to maintain emissions of sulfuric acid mist below 0.005 gr/acf.**

[96] An example of agglomerator technology is the Indigo Agglomerator, which was developed to reduce visible emissions from coal fired boilers. The Indigo Agglomerator contains two sections, a bipolar charger followed by a mixing section. The bipolar charger has alternate passages with positive or negative charging. This can be contrasted with a conventional ESP on a coal fired boiler, which has only negative charging electrodes. Following the charging sections, a mixing process takes place, where the negatively charged particles from a negative passage are mixed with the positively charged particles from a positive passage. The close proximity of particles with opposite charges causes them to electrostatically attach to each other. These agglomerates enter the ESP, where they are more easily collected due to their larger size.

[97] **As existing Basic Oxygen Furnaces (BOFs) at steel mills are routinely controlled by ESPs, a basic strategy to lower the particulate emissions of an existing BOF is to enhance the performance of its ESP. This is discussed by RTI International in "Evaluation of PM2.5 Emissions and Controls at Two Michigan Steel Mills and a Coke Oven Battery," February 7, 2006, which also mentions agglomeration technology as a possible technique for lowering the particulate emissions of BOFs. However, enhanced ESPs would still not achieve the concentrations of filterable particulate from a BOF that would be expected with a new filter control system.**

[98] **In Illinois, Dynegy has installed an Indigo Agglomerator on its coal-fired Havana Unit. This action was taken to lower the particulate matter emission rate of this unit,**

and use of this technology happens because applicable particulate emission limits are being tightened to levels that the installed ESPs are not designed to meet. Alternatively, changes have occurred in the coal supply so that units can no longer readily meet established limits. Agglomeration technology was not developed to enhance the performance of baghouses. Moreover, this type of enhancement should not be needed for a new baghouse. Use of an agglomerator system before the proposed baghouses cannot be presumed to provide any further reduction in emissions, especially if an advanced filter media were used.

110. Another method to enhance the control of emissions of fine particulate would be use of an advanced baghouse collector. There are several types of advanced baghouse collectors designed specifically to remove $PM_{2.5}$. Compact Hybrid Particulate Collector (COHPAC) technology is one advanced collector technology.[99] The USEPA's Environmental Technology Verification (ETV) program recently verified the performance of the "Advanced Hybrid Particulate Collector" system "…as providing the lowest filter outlet concentrations for both $PM_{2.5}$ and total mass concentration."[100]

Some of the "advanced" collectors cited in this comment are again approaches to enhance the performance of existing ESPs. The common element of these collectors is the combination of first-stage particulate removal using an ESP, followed by second-stage removal with a baghouse. This is advantageous for retrofit at an existing coal-fired utility boiler because a much smaller baghouse can be added, the bulk of the fly ash can be collected by the existing ESP, and activated carbon for mercury control can be injected between the ESP and the baghouse. However, these circumstances are not present at the proposed plant, for which "advanced collectors" would provide no advantages over the baghouse itself.

The Advanced Hybrid Particulate Collector is another developing technology that combines electrostatic precipitation and filtration technology to provide a compact but efficient control system. However, as noted in passing by the comment, the final step in this collector is again the filter, so that the effectiveness of the collector for particulate control is determined by the effectiveness of filtration. As such, this collector technology does not provide any advantage over stand-alone filtration technology for control of particulate. Rather, its advantage is economic. The technology allows for a smaller and thus less costly filter unit, with primary collection of particulate performed by the precipitation zone of the collector, which is also smaller and thus less costly than a conventional ESP. Moreover, as the filter

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which is over 30 years old to comply with a tighter emission limit established in a Consent Decree with USEPA and a number of environmental advocacy organizations.

[99] The COHPAC is a pulse jet filter module operated at a very high filtration velocity (air-to-cloth ratio), installed downstream of another particle collection device. The function of a COHPAC is as a "polishing filter," collecting the particulate (especially fine particulate) that escapes the primary device. A full-scale COHPAC system has been installed at the Gaston coal-fired power plant near Birmingham, Alabama.

[100] The Advance Hybrid Particulate Collector system is installed at Otter Tail Power's Big Stone coal fired power plant in South Dakota. Analyzing the performance of the system at that plant, the US Department of Energy explained that "The Advanced Hybrid™ consists of alternating electrostatic precipitation and fabric filtration elements in a single casing to achieve exceptional removal of particulate matter (PM) in a compact unit. Very high removal is achieved by removing at least 90 percent of the PM before it reaches the fabric filter and using a membrane fabric to collect the particles that reach the filter surface. . . . Combining precollection with the ESP elements and membrane filter bags results in a small, economical unit that can achieve very high collection of all particle sizes."

unit in this collector is smaller than a conventional filter, it is important that there be more full-scale experience with this technology to assure that all issues potentially posed by coordinated operation of the precipitation and filtration units are fully resolved. In particular, while the technology has shown good particulate removal, problems have also been experienced with poor performance of the precipitation unit and failure of filter bags.

111. Another method to enhance the control of emissions of fine particulate would be use of a more efficient SO_2 control system. Gateway selected a dry flue gas desulfurization process, primarily an SO_2 removal process, as BACT/LAER for **PM_{10}**/ $PM_{2.5}$. Other types of scrubbers that were not evaluated have higher removal efficiencies for $PM_{2.5}$. These include the Chiyoda jet bubbling reactor, Alstom's Turbosorp, and circulating fluidized bed scrubbers.

While modern SO_2 scrubbers on coal-fired utility boilers may provide some additional control of filterable particulate when paired with an upstream ESP for primary particulate matter control, they cannot be assumed to provide additional control of filterable particulate when followed by a baghouse. In other words, baghouses, which are specifically designed for control of filterable particulate, can readily outperform scrubbers for control of filterable particulate. In addition, as wet scrubbers contribute to the formation of sulfuric acid mist, the principle constitute of condensable particulate, they increase total emissions of PM_{10}/$PM_{2.5}$. In contrast, as the water in the lime slurry introduced in the spray dry absorber evaporates before the baghouse, the combination of a spray dryer absorber and baghouse can control sulfuric acid mist in the gas phase, rather than as a fine water droplet as sulfuric acid mist also exists in the exhaust from a wet scrubber.

The level of control achieved by the SO_2 scrubber on the main stack at the proposed plant for SO_2 emissions is not relevant to control of particulate emissions. Nevertheless, use of a spray dryer absorber technology is appropriate for control of SO_2 for a variety of reasons, including the nature of the plant and the exhaust stream. Dry scrubbing also provides capability for additional control of S02 emissions should it be required.

112. The BACT/LAER analysis did not consider all of the available technologies that are feasible to reduce $PM_{2.5}$ emissions. Much lower $PM_{2.5}$ emission rates can be achieved than proposed here as BACT and LAER (99 percent control) by using a combination of controls, such as an agglomerator and a baghouse or a baghouse and a wet electrostatic precipitator (99.9+ percent). Thus, there is no excuse for not conducting a proper LAER analysis for $PM_{2.5}$, the regulated pollutant.

As already discussed, combination of control technologies, as suggested by this comment, would not improve the performance of the control system for particulate matter. The BACT/LAER determination appropriately relies upon filtration technology for control of filterable particulate and dry scrubbing technology (i.e., the combination of a spray dryer absorber followed by a fabric filter) for control of condensable particulate.

113. Gateway proposed, and the Illinois EPA accepted, the use of Maximum Achievable Control Technology (MACT) limits as BACT and LAER for PM_{10} emissions from oven doors, charging, pushing, and quenching emissions. This is not a legitimate approach. The Clean Air Act requires that BACT limits be set on a "case-by-case basis" for each individual unit subject to PSD, with consideration of other options for the types of pollution

controls that could be used for different emission units.

MACT was not selected as BACT or LAER absent the case-by-case review that is required to set BACT and LAER limits. The Illinois EPA's review of the proposed coke plant project found that the criteria to set BACT and LAER were met. Moreover, given the nature of the process that USEPA must follow when setting MACT, it is not realistic to expect that this case-by-case review for the proposed plant would identify options for control technology that would be more appropriate than those that are the basis of the emission limits that USEPA set as MACT. In addition, MACT certainly provides the appropriate form in which BACT and LAER limits should be set for the proposed plant, as MACT provides the form in which emission rates from the various units at coke plants are now commonly reported.

114. The Clean Air Act directs USEPA to set MACT limits based on an industry-wide analysis. Moreover, Congress tied USEPA's hands in setting MACT standards specifically for coke ovens. Whatever political considerations affected Congress's dictates to USEPA with respect to MACT standards are not reflected in the Clean Air Act's BACT and LAER provisions.

The MACT Standard for new coke oven batteries were clearly an appropriate starting point for the BACT/LAER analysis. As related to MACT standards for new sources in a source category, Section 112(d)(3) of the Clean Air Act directs USEPA to set MACT standards that represent the maximum degree of reduction, which "… shall not be less stringent that the emission control achieved in practice by the best controlled similar source." Accordingly, the criteria that USEPA is to meet when adopting MACT standards for a new source incorporates criteria that combine the regulatory criteria for the establishment of both BACT and LAER limits. Using such criteria, USEPA adopted MACT standards for control of emissions of hazardous air pollutants from coke ovens that use limits set in terms of particulate matter as a surrogate for emissions of individual hazardous air pollutants.

Moreover, the Clean Air Act did not "tie USEPA's hands" so as to restrict USEPA's ability to set tight MACT limits for coke ovens, as implied by this comment. Indeed, given concerns over impacts from the emissions hazardous air pollutants from existing coke oven batteries, in Sections 112(d)(8) and (i)(8) of the Clean Air Act, Congress set certain minimum requirements for the MACT standards adopted by USEPA for existing batteries, accompanied by specific deadlines by which USEPA was to act. Congress also required USEPA to evaluate "negative pressure" coke oven plant technology, which does not involve coke by-product recovery and processing, like the proposed plant, as the basis for MACT emission standards for new coke oven batteries.

115. NA NSR provides yet a third approach for determining LAER. While LAER, like MACT, is set on a categorical rather than case-by-case basis, they must reflect "the most stringent emission limitation" either in any state's SIP or actually achieved by a unit, "whichever is more stringent."

The LAER analysis for the proposed plant addressed the third approach to establishing LAER, as described by this comment. In material from January 2007, the application for the coke plant provides a listing of the SIP requirements of various states that could apply to units at heat recovery coke plants. The limits imposed by the permit are at least as stringent as these requirements. Also included in the January 29, 2007 letter is a listing of PM emission rates achieved in practice by different units at heat recovery coke

plants. The limits in the issued permit are at least as stringent as the limits in this listing.

116. In determining BACT for PM_{10}, the application only looked to other heat recovery coke plants, rejecting controls used on other similar sources that achieved lower PM_{10} emissions. Further, the application failed to look at technologies in use outside of the United States. A BACT analysis must include technologies employed outside of the United States as well as those used not only for the source category in question, but also (through technology transfer) controls applied to similar source categories and gas streams, and innovative control technologies.

The control technology determination appropriately focused on heat recovery coke plants, given the specialized nature of these plants. While knowledge of emissions control systems used on other source categories may be useful, that knowledge supports the control technology determination that has been made. Moreover, the purpose of a control technology is to identify technology that is feasible, available, and applicable to the unit under review. The purpose of the control technology determination is not to identify and require a source to conduct research and testing of a "developing" control technology, whose suitability and performance to a particular unit is uncertain. This is especially important for the proposed plant given its location in an area that is currently nonattainment. As clearly stated in USEPA's draft NSR Workshop Manual, technologies that have only progressed to the pilot or demonstration stage in the development of the technology should not be considered available.[101] In this regard, for the main stack, the combination of a dry scrubber and baghouse is well demonstrated as a robust approach to emissions control. It is routinely used on new utility boilers fired with low-sulfur Western coal. It is also the core of the established BACT control train for municipal waste incinerators.

117. In determining LAER for $PM_{2.5}$, the application only looked to other heat recovery coke plants. This is too narrow and resulted in missing technologies that have been successfully applied to gas streams from other sources with similar chemical and physical characteristics. It also resulted in LAER limits that are too high and $PM_{2.5}$ emissions that are least a factor of ten higher than they should be, i.e., only 99 percent efficient, rather than 99.9 percent efficient

This comment was not accompanying by information showing that more effective control technologies were missed in the BACT/LAER evaluation. Filtration, in association with measures to specifically target control of condensable particulate, is widely recognized as providing the best control of particulate for exhaust streams and particulate for which filtration can be effectively used.[102] This comment does not dispute this fact.

This comment also reflects a flawed understanding of the meaning of removal efficiency as applied to baghouses. At most, the efficiency of a filter is

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[101] **The only exception to making a control technology determination that is founded upon a control technology that is commercially available, effectively a technology that has already been shown to be reliable and dependable, is if a source voluntarily elects to use a developing technology that is not yet currently commercially available.**

[102] **Certain exhaust streams are not amenable to filtration as the particulate is sticky or the exhaust stream has other components that act to rapidly blind or destroy the filter media or the structure of the filter. Filters also are not effective in direct control of condensable particulate, which is present in the gas phase in the ductwork of a unit.**

only a meaningful metric to compare the performance of different filters on identical or very similar exhaust streams.[103] The appropriate metric for comparison of filter is the concentration of particulate in the controlled exhaust stream, either directly expressed in terms such as gr/scf or in terms that indirectly relate the mass of emission to the volume of exhaust, such as lb/million Btu heat input. This is a direct measure of the amount of material that is not collected by the filter and "penetrates" through the filter to become emissions. Use of such a metric is especially important when comparing performance of filters across different types of emission units. It is also the metric routinely used to set emission standards and limits for particulate emissions, which are only rarely set in terms of a required efficiency for the control device.

Finally, in light of the above discussion, this comment does not demonstrate any difference in the required performance of the filters on emission units at the proposed plant and the required performance of filters on units at other similar plants. This is because the comment does not provide data on the concentration of particulate allowed in the exhaust of different units. It merely provided claimed levels of removal efficiency for filter performance without any relevant supporting information.

118. The determination of LAER should include consideration of "technology transfer."[104, 105] That is, for purposes of evaluating the feasibility of a possible control technology, what matters is whether the characteristics of the exhaust stream that is to be controlled, such as pollutant concentration and composition, are sufficiently similar to exhaust streams on which that control technology has been demonstrated to be effective. However, Gateway's LAER analysis did not consider technology transfer. In particular, analysis concluded that a spray dryer absorber designed to remove 90 percent of the SO_2 and a fabric filter designed to remove 99 percent of the filterable PM_{10} is LAER for $PM_{2.5}$ emissions from the main stack. This exhaust stream is similar to flue gases from coal-

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[103] **Due to this phenomenon, USEPA's Environmental Technology Program evaluates the performance of different filter media using a laboratory apparatus that exposes each media that is tested to an identical concentration of "artificial" particles of a known size and density. In particular, this testing is performed using a constant inlet dust loading rate 8.0 ± 1.6 gr/dscf and aluminum oxide test dust with a measured mass mean aerodynamic diameter maximum of 1.5 µm, as well as a consistent filtration velocity of 6.6 ± 0.3 ft/minute. This supports an artificial ranking of filter media based on this experimental apparatus. However, this does not mean that a tested filter media will have the efficiency measured when using the laboratory apparatus when used to control actual exhaust streams. The actual efficiency, if ever measured would be different as the loading of particulate and its particle size distribution and density, as well as other aspects of operation of a filter in an control device, will be different from those present for the experimental apparatus.**

[104] The USEPA's draft NSR Manual states that: "the reviewing agency also can require consideration of technology transfer. There are two types of potential transferable control technologies: (1) gas stream controls and (2) process controls and modifications. For the first type of transfer, classes or categories of sources to consider are those producing similar gas streams that could be controlled by the same or similar technology."

[105] John Calcagni, Director of USEPA's Air Quality Management Division, in an August 29, 1988, memorandum to David Kee, Director of the Air and Radiation Division, Region V, USEPA, discussed the transfer of technology between source categories in determining LAER. Mr. Calcagni explained that there are two types of transfers: (1) gas stream controls, and (2) process controls and modifications. The first kind of transfer considers the class or category of sources to include any sources that produce similar gas streams that could be controlled by the same or similar technology.

fired utility boilers. Indeed, the BACT analysis considered coal-fired boilers when evaluating SO_2 limits. The particulate emissions from these similar units are routinely controlled with wet scrubbers designed to achieve over 95% and frequently 98 to 99 percent control of the SO_2, electrostatic precipitators or baghouses designed to remove 99.9+ percent of the particulate matter, and wet electrostatic precipitators to remove over 90 percent of the sulfuric acid mist, the major component of the condensable fraction of PM_{10} and $PM_{2.5}$. These more effective levels of control, which are routinely required for new coal-fired boilers, are LAER for $PM_{2.5}$ from the main stack of the proposed plant.

Transfer of control technology was appropriately considered in the BACT/LAER analysis. It should first be observed that the analysis did not evaluate performance for PM. While values for control efficiency may be found in various locations in the application, they should not be considered to be literal statements of control efficiency. Rather, they are figurative statements that indicate high levels of performance. In this regard, as with particulate matter, there is not a location in ductwork at which "uncontrolled" emissions of sulfuric acid mist could be measured in a way that could be reasonably used to calculate control efficiency. Moreover, emissions of sulfuric acid mist are controlled not only by add-on control, but also by minimizing formation of sulfuric acid mist.

Accordingly the appropriate metric that should be used to compare the particulate matter emissions of the main stack at the proposed plant to those of new coal-fired utility boilers is the concentration of emissions in the exhaust stream after control. Properly considered on this basis, the limits that have been established for particulate emissions from the main stack are lower, i.e., more stringent, than limits that are currently being set for particulate matter emissions from new coal-fired utility boilers, such as Long View Power, Prairie State Energy, MidAmerican Energy Unit 4, and Springfield City Water, Light and Power Unit 4.[106]

Similarly, emissions of sulfuric acid mist from different emission units should be compared considering both the concentration of emissions and the performance of the control system. In addition, one must recognize that control of sulfuric acid mist does not necessarily correlate with control of emissions of SO_2. This is relevant for the proposed plant as spray dryer absorber technology is significantly more effective for control of sulfuric acid mist than wet scrubbing technology. Accordingly, as the control technology determination is being made for emissions of particulate from the coking process, dry scrubbing technology is appropriately selected as a component of the technology selection that underlies the BACT determination.

119. The principal source of particulate emissions is the main stack from the coking process. The application concluded that BACT for PM_{10} and LAER for

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[106] **The BACT limits for proposed utility boilers are set in terms of pounds of pollutant per million Btu heat input (lb/mmBtu), as appropriate for a boiler. Particulate limits that are currently being set as BACT range from 0.010 and 0.015 lbs/mmBtu for filterable PM. For total PM_{10} (combined filterable and particulate), limits range from 0.018 to 0.035 lb/mmBtu. Using an average of the standard F-factors from USEPA Method 19 for bituminous coal, 9,780 scf per mmBtu, equivalent emission rates for filterable PM_{10} in gr/dscf would be in the range of 0.0072 and 0.0107. Equivalent rates for total PM_{10} would be in the range of 0.0129 to 0.0251 gr/scf. These equivalent rates, are in gr/dscf, are distinctly higher than the BACT limits for the main stack at the proposed plant in the issued permit, which are 0.005 and 0.011 gr/scf, for filterable and total PM_{10} respectively.**

$PM_{2.5}$ for this unit is the baghouse associated with the spray dryer/baghouse system selected to remove 90 percent of the SO_2. In the project summary, the Illinois EPA explained that this combination of devices is well suited to control PM_{10} as the spray dryer will cool the flue gas stream to below 250 °F before it enters the baghouse. The combination of these two technologies, which are commonly referred to as a "dry scrubber-baghouse," was selected as LAER with no further analysis. A spray dryer/fabric filter system does not satisfy either BACT or LAER for PM_{10} or $PM_{2.5}$. Further, the SO_2 BACT analysis used to select a dry scrubber baghouse is not a substitute for a PM_{10}/ $PM_{2.5}$ BACT analysis.

The combination of dry scrubber/baghouse was appropriately selected as the control technology underlying the BACT determination, following appropriate analysis. Dry scrubber/baghouse systems generally provide very effective control of both condensable and filterable particulate. The emission limits that have been set as BACT and LAER in the issued permit, as obtained with the use of this technology, are also appropriate. A BACT analysis for SO_2 emissions was not used by the Illinois EPA as a substitute for the required analysis for emissions of particulate.

120. The application does not contain the traditional five-step process used to determine BACT for units that emit PM or PM_{10}.

Gateway's July 2006 application beginning at Section 6.0 does contain the traditional "Top-Down" methodology. While the "steps" are not identified as steps in the application, the relevant information is supplied. In addition, it is arguable that a traditional Top-Down BACT analysis is not generally warranted for emission units at the proposed plant that are subject to LAER, as well as BACT.

121. The application for the proposed coke plant contains a BACT analysis for SO_2 .emissions. The Application claims that "consideration should be given to the fact that the complete control system must also control emissions of SO_2 from the process." While I strongly support aggressive control of SO_2, an SO_2 BACT analysis alone does not satisfy the requirement to perform a BACT analysis for PM_{10} and a LAER analysis for $PM_{2.5}$. The SO_2 analysis concluded that BACT for SO_2 is a dry flue gas desulfurization system, which consists of a spray dryer absorber and a downstream baghouse. The analysis then concludes that the dry scrubber (with its associated downstream baghouse) is BACT for PM_{10} and LAER for $PM_{2.5}$.

While Gateway included a BACT analysis for the SO2 emissions from the main stack in its application, the Illinois EPA did not make a BACT determination for SO_2 emissions. This is because the coke plant is not a major project under PSD for emissions of SO_2. In addition, while this "superfluous" SO2 analysis did address particulate emissions in the manner described by this comment, Gateway also included a separate detailed control technology analysis specifically for emissions of particulate.

122. BACT and LAER analyses must be conducted separately for each pollutant. The regulated pollutants are PM_{10} and $PM_{2.5}$ and the BACT and LAER analyses must be conducted for these pollutants, not for SO_2, which was apparently used as a surrogate. Control options for SO_2 are designed to remove SO_2, not PM_{10}. Any PM_{10} removal that is achieved is incidental to the primary purpose, which is SO_2 control.

SO_2 was not used as a surrogate for particulate in the BACT and LAER analyses, as suggested by this comment. However, the use of dry scrubbing or spray dryer absorber technology was a specific consideration in the analysis for particulate emissions specifically focusing on the direct and indirect benefits of dry scrubbing for control of condensable particulate emissions, as dry scrubbers control sulfuric acid mist and cool the gas stream.[107] As such the analysis appropriately focused on control of PM_{10} and $PM_{2.5}$

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123. This surrogacy approach resulted in evaluating only dry and wet SO_2 scrubbing, sorbent injection, and clean coal for PM_{10} control. A BACT analysis for PM_{10} should have identified additional control options and lower PM_{10} emission limits. The additional control options, discussed above, include a baghouse equipped with filtration media that removes 99.9%+ of the PM_{10} and $PM_{2.5}$ and combinations of control devices including a baghouse and agglomerator or a baghouse and a wet electrostatic precipitator. These various control options could achieve greater than 99.9% PM_{10} and $PM_{2.5}$ control (compared to only 99% assumed in the BACT analysis), but were not even considered.

The BACT/LAER analysis properly targeted fabric filtration as the appropriate control technology for control of filterable particulate matter from the main stack. For example, refer to Gateway's January 2007 supplement to its application in which Gateway provided its LAER determination.[108] The BACT/LAER analysis also appropriately focused on spray dryer - fabric filter systems as the appropriate control technology for condensable particulate. For example, again refer to Gateway's January 2007 LAER supplement to its application.[109] As also discussed above, the alternative combinations of control devices suggested by this comment for the main stack should not be expected to better performance than the spray dryer - fabric filter systems control system that is required.

124. The regulated pollutant for purposes of the BACT requirement is PM_{10}. Thus, the BACT determination should establish an emission limit based on the maximum degree of reduction that is achievable for PM_{10}. However, the BACT analysis does not even disclose the control efficiency of the selected BACT technology for PM, but rather focuses on the control efficiency of dry scrubbing for SO_2, which is not subject to NSR review.

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[107] The project summary explains that for the main stack, a fabric filter will be used to control emissions of filterable particulate. It continues explaining, that the "…the spray dryer will cool the flue gas stream to below 250 °F before it enters the fabric filter and will control emissions of both SO2 and sulfuric acid mist so as to facilitate control of condensable particulate…"

[108] Gateway's LAER submittal indicates that collection efficiencies of fabric filters for filterable particulate can be as high as 99.9%. At the same time, the performance of the baghouses on different existing units are evaluated in terms of the concentration of filterable particulate in the exhaust, gr/scf, or in terms of an emission factor, pounds/ton. The performance of different units is not compared in terms of efficiency nor are any SIP limits identified that are expressed in terms of a required level of efficiency for filterable particulate.

[109] Gateway's LAER submittal indicates that spray dryer- fabric filter would be well-suited to control of condensable particulate because the temperature of the exhaust stream entering baghouse would be approximately 220 °F. The expected control efficiency for sulfuric acid mist is 98 %fabric filters. At the same time, the control systems on different existing units are evaluated in terms of the concentration of total particulate (filterable and condensable) in the exhaust, gr/scf, or in terms of an emission factor, pounds/ton. The performance of different units is not compared in terms of efficiency nor are any SIP limits identified that are expressed in terms of a required level of efficiency for total particulate.

The PM_{10} control efficiency, instead, must be ferreted out of the appendices in the application.

Filtration technology is clearly the top-ranked control technology for emissions of filterable particulate from the units at the proposed plant on which baghouses can be used. The combination of a fabric filter with a spray dryer is appropriate for the main stack, where the exhaust stream contains SO_2 and, more importantly, sulfuric acid mist (H_2SO_4), which is major component of condensable particulate. As also discussed, control efficiency is not a meaningful way to express the performance of a baghouse. Accordingly, it was not necessary or appropriate for Gateway to provide control efficiency data for the proposed baghouses as part of its control technology demonstration, as suggested by this comment. Moreover, it is not appropriate for this comment rely on the value of 99% control efficiency for the proposed baghouse in the manner that the comment does, as this value was "ferreted" out of the application. As clear from the context in which this value was provided by Gateway, this value of efficiency was not intended to have the significance that this comment places upon it

125. A baghouse associated with a spray dryer does not necessarily satisfy the maximum degree of reduction requirement as all baghouses are not created equal. This is especially true of a baghouse downstream of a spray dryer, which is designed to remove lime from the spray dryer, not the native particulate loading in the exhaust stream to BACT levels. The spray dryer injects a lime slurry into an absorber vessel to absorb with SO_2. This dried lime which increase the particulate loading at the inlet to the baghouse, compared to the native gases. Thus, a spray dryer increases the particulate loading on the downstream baghouse, compared to a baghouse located upstream of a wet scrubber for SO_2 control.

This comment correctly observes that the presence of the spray dryer in the control train increases the loading of particulate matter entering the baghouse on the main stack. This baghouse effectively serves as a control device for both the "native" particulate loading and the particulate from the upstream SO_2 control device. However, it does not follow that this is inappropriate or that another sequence of control devices would be more effective in minimizing particulate emissions, as this comment implies. First, as already observed, as a proposed new coke plant, it is certainly appropriate for the plant's main stack to include a control device for the SO_2 emissions associated with the coking process. In the absence of such a device, SO_2 emissions would be many times higher than they will be and SO_2 emissions may be readily controlled with a flue gas desulfurization system. Second, irrespective of whether the baghouse is located before or after the SO_2 control device, PM emissions from the main stack would be affected by the presence of both control devices. However, the proposed sequence of control devices is readily demonstrated to be more effective for control of particulate emissions. This is because filtration technology is widely recognized as being more effective at control of particulate emissions than scrubbing technology. The improvements in design of filter media only act to increase this gap in performance.[110] It directly follows that in this case in which the pollutant of greatest concern is particulate, as it is subject to BACT and LAER, the particulate control device

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[110] **Improvements are also occurring for scrubbing technology for emissions of both SO2 and particulate. However, those improvements are most significant for control of the targeted pollutant, SO2, by scrubbing. Work to improve control of particulate emissions is focused on improvements to particulate matter control devices, with specific attention on retrofit technology for existing ESPs, as addressed in other comments.**

should be the final device in the control train. Moreover, with this sequence of control devices, the scrubber supports operation of the baghouse, as it provides an ample loading of dust to support the filter cake and provides additional thermal and chemical protection of the filter media. Control of particulate should not be downgraded to a wet scrubber, which like a dry scrubber, is also a source of particulate due to the limestone in the scrubbant and the formation of sulfuric acid mist, from oxidation of SO_2 to SO_3.

It must also be noted that this comment correctly observes that the particulate emissions from the plant's main stack are not simply combustion particulate, but a mix of combustion particulate and lime particulate from the spray dryer. As such, it is not appropriate to characterize the emissions from this stack, which based on permitted emissions is the largest emission unit at the plant, as consisting entirely of combustion particulate, which is predominately $PM_{2.5}$.

Finally, this comment also confirms that control efficiency is not a meaningful indicator for the performance of a filtration device. This is because the crude calculation of efficiency, comparing the amount of material entering the filter and the amount emitted from the filter, can be greatly affected by the amount and nature of the particulate going into the device.[111] The more appropriate measure of the performance of a filter is the amount of material emitted by a filter as used on a given exhaust stream. In this regard, as already explained, the permit for the main stack sets stringent limits for emissions of particulate, which are better than those currently being set for new coal fired utility boilers, which are a relevant benchmark for the particulate emissions of the main stack, as confirmed by various comments.

126. The effectiveness of any baghouse for PM_{10} and $PM_{2.5}$ can be affected by the type of filtration media. The application is silent as to the filtration media proposed for the baghouse and instead only reports a control efficiency of 99%, buried in an emissions appendix. The control options for PM_{10} (which were not even identified) should have been ranked by control effectiveness. The BACT analysis does not contain any ranking of control options based on their effectiveness and presents no evidence that 99% is the top control efficiency. In fact, the application admits that baghouses can achieve 99.9% PM_{10} control, but does not explain why the baghouse that would control the main stack is only specified for 99% $PM_{10}/PM_{2.5}$ control.

As already discussed, the control technology analysis for the baghouse has been expanded to consider selection of filter fabric. As a result, the BACT/LAER limits for particulate in the issued permit are lower than those proposed in the draft permit. As also explained, efficiency is not a useful metric for the performance of a filter in controlling emissions of particulate. Finally, the reference in this comment to an efficiency value for the baghouse that was provided in the application misrepresents the information that was provided.[112] It was not submitted for the purpose of providing comparative data by which the baghouse for the main stack could be compared to baghouses on other similar or comparable emissions units. For purposes of comparison, the application expressed the performance of the baghouse in terms of the concentration of

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[111] **If a large quantity of particulate of a size that can be readily collected is going into a filter, the calculated efficiency of the filter is a reflection of the loading to the filter, not the filtration capabilities of the device and its filter media.**

[112] **The summary of emissions in the cited appendix of the application clearly states that "Emission factor is in grain loading which is a controlled value; therefore percent control is given for informational purposes only and is not used in the calculation."**

particulate in the exhaust, in gr/scf.

127. The BACT analysis for direct venting during maintenance considered six alternative options for controlling emissions. However, design of the gas handing system to eliminate uncontrolled venting during maintenance was not considered. This would be technically feasible and less costly than the options that were evaluated, and likely would have been selected as BACT

Design of the gas handling system of the coke oven battery to eliminate uncontrolled bypass venting during equipment maintenance waste, as broadly claimed in this comment, is not practical.[113] The BACT/LAER analysis evaluated the most likely "design" alternatives to control emissions during bypass venting. The most likely design alternative, individual spray quenches as an alternative to the heat recovery steam generators, would only address emissions from bypass venting associated with maintenance of the heat recovery steam generator, with a projected cost-effectiveness of $199,000 per ton of PM_{10} controlled. Such costs are clearly excessive and the BACT/LAER analysis appropriately selected bypass minimization as the appropriate "technology" to minimize emissions from bypass venting.

128. For venting during maintenance, use of a quench system designed to achieve 90+ percent control of PM_{10} without any downstream control device was also not considered. This would also be technically feasible and less costly than the options that were evaluated, and could have been selected as BACT.

A stand-alone quench system would not provide anything close to the effectiveness of control suggested by this comment for the direct particulate emissions from the coking process and should be expected to have better cost-effective than the "parallel" quench system that was evaluated. In addition, the plume from the quench system could interfere with visibility in the vicinity of the heat recovery steam generator on which maintenance was being performed, so as to present a safety concern for workers.

129. For venting during maintenance, use of an electrostatic precipitator designed for high temperature service, similar to the hot-side electrostatic precipitators historically used in coal-fired power plants was also not considered. This would also be technically feasible and

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[113] Gateway addressed the following options in its application submitted July 2006.
(1) Individual Spray Quenches: While technically feasible, the projected cost-effectiveness is $199,000 per ton, which the Illinois EPA considers excessive.
(2) Central Spray Quenching: While technically feasible, the projected cost-effectiveness is $290,000 per ton, which is excessive.
(3) Larger Waste Heat Tunnel and Heat Recovery System Generator: This option has not been demonstrated and cannot be considered feasible. To accommodate a waste heat tunnel sufficient to handle the gas such that no by-pass venting would occur, a comprehensive redesign of the coke oven battery would be needed, e.g., redesign of the uptakes, oven walls, sole flues, etc. Furthermore, the key advantages of the heat recovery design are operation at negative pressure and complete combustion. A redesign of sole flues, walls and uptakes could adversely affect these key advantages.
(4) Addition of a Heat Recovery Steam Generator: While technically feasible, the projected cost-effectiveness is $347,000 per ton, which is excessive.
(5) Individual Dry Scrubbers On Each Vent: While technically feasible, the project cost-effectiveness is $522,000 per ton, which is not cost-effective.
(6) Individual Wet Scrubbers On Each Vent: While technically feasible, the projected cost-effectiveness is $1,184,000 per ton, which is not cost effective.

less costly than the options that were evaluated, and could have been selected as BACT.

So-called "hot-side" electrostatic precipitators have a maximum operating temperature of approximately 800 °F. Use of electrostatic precipitators to control bypass venting, as suggested by this comment, is clearly not technically feasible as the exhaust gas temperature for the waste heats stacks is approximately 2000 °F.

130. For venting during maintenance, use of a multiclone was also not considered. This would also be technically feasible and less costly than the options that were evaluated, and could have been selected as BACT.

Multiclone would not be an appropriate technology for the waste heat stacks for a variety of reasons. As the multiclones would be constructed of steel, they would be subject to damage from thermal stress due to temperature extremes. They would not provide reliable control for the large volume of exhaust that passes through the waste heat stacks during bypass.

131. For venting during maintenance, use of a wet scrubber as the principal SO_2 control and an upstream baghouse selected to optimize particulate removal (a scrubber includes a water quench before the absorber) was also not considered. This would also be technically feasible and less costly than the options that were evaluated, and could have been selected as BACT.

The control configuration suggested by this comment would not be less costly than the alternatives that were evaluated. It would essentially entail a second "full-scale" control system in parallel with the control system on the main stack. Moreover, an upstream baghouse would not be technically feasible because of the high temperatures of the exhaust gases. Although lower operating temperatures are preferable, appropriately designed baghouse may operate at temperatures up to approximately 500 °F, whereas the exhaust gas temperature during bypass venting would be approximately 2000 °F.

131. For venting during maintenance, adoption of work practices to minimize emissions during maintenance, including not charging coal into the ovens that feed a heat recovery steam generator during maintenance for some or all of the maintenance period and using natural gas to keep the ovens hot to avoid thermal stresses was also not considered. This would also be technically feasible and less costly than the options that were evaluated, and could have been selected as BACT.

The work practices to reduce the magnitude of emissions during bypass venting suggested by this comment were considered. It is not feasible to operate the ovens without charging coal, using natural gas to maintain heat without damage to the ovens. This is because the accompanying changes in the temperatures in the ovens would damage the refractory structure of the ovens. The ovens are designed for the temperatures present with the normal coking cycle of the ovens and cannot be designed to also meet an alternative temperature profile during periods of equipment maintenance. Heating of the ovens with natural gas can not maintain the normal temperature profiles that occur with "natural" heating of the ovens by the coking process.

Work practices that are feasible are being required. In this regard, the issued permit includes additional work practices that were not included in the draft permit. In particular, the issued permit generally requires that bypass venting and maintenance activities be addressed by the Startup Shutdown and

Malfunction Plan required by the NESHAP. This generally requires that good practices be used to minimize emissions during these periods in accordance with a formal plan that is subject to review and refinement over time. In addition, the rate at which coal is charged to ovens that contribute to bypass venting must be reduced as it is practical to do so, in accordance with the Startup Shutdown and Malfunction Plan. Specific requirements for the extent of such reduction in charging are set for bypass venting during the performance of maintenance on the main control system.

132. The analysis of venting emissions included a BACT cost effectiveness analysis, which concluded that economic impacts of various control options would be excessive as the costs for the least expensive option was $199,000 per ton of PM_{10} removed. It also concluded that since there were no previous determinations for a heat recovery coke plant that required use of any option than bypass minimization, that LAER for bypass venting is the same as the proposed BACT technology. However, a top-ranked control option in a BACT analysis cannot be rejected in a vacuum based on costs. Rather, a top control option can only be rejected for economic reasons if an applicant can demonstrate that the cost-effectiveness in dollars per ton of pollutant removed is above the levels experienced by other sources. The applicant must demonstrate that the claimed adverse economic impact is unique to the specific source and support that conclusion with an objective and documented analysis. The files I reviewed contain no evidence that the cost to install any of the proposed controls for the coke venting emissions are unique to the coke plant or outside of the range of costs borne by other applicants for similar sources seeking to control $PM_{2.5}$ and PM_{10}. Other "similar" sources must be considered in this determination.

Top-ranked control options for maintenance venting were not rejected "in a vacuum." The various options involving additional hardware for maintenance venting were rejected because such requirements have not been imposed on other heat recovery coke plants, which are the other similar sources, i.e., the sources that comprise the relevant source category that must be considered when making a LAER determination. In addition, the cost-effectiveness for installing and operating such reserve control systems, in dollars per ton controlled, are far in excess of the greatest costs ever normally expended for control of particulate emissions.[114] Finally, expenditure and effort for emissions control of the plant are more appropriately focused on improving the performance of the control system on the main stack and minimizing the duration of maintenance venting.

133. While the definition of BACT includes the consideration of costs, the definition of LAER does not. USEPA guidance provides, in a generic sense, for limited consideration of economic factors in a LAER determination.[115] When discussing costs, applicants should compare

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[114] **Bypass venting should occur for at most for 12 "normal operating days per year, after accounting for the mandatory 17 percent reduction in operating rate that must accompany bypass for the dry scrubber/baghouse system and the fact that bypass for the heat recovery steam generators must routinely take less than 8 days, to accommodate unforeseen events during maintenance work. It directly follows that the cost-effectiveness of a duplicate, control system, identical to the primary control system, to address operation during inspection and maintenance activity would be approximately 30 times that of the primary control system (365 – 12 ÷ 12 = 29.4).**

[115] USEPA policy provides that if a particular limit would preclude construction of new emission units within a class or category of sources, a permitting authority should

control costs for the proposed source to the costs for sources already using that control.

While the definition of LAER at Section 171(1) of the Clean Air Act does not specifically mention consideration of cost impacts (unlike the definition of BACT at Section 165(3) of the Act), appropriate consideration of economic impacts is inherent in the definition of LAER, as confirmed by USEPA guidance. It is inherent, as the definition of LAER focuses the control technology determination on emission limitations that are achieved for a class or category of source. Thus, the relevant question for the LAER determination for maintenance venting at the proposed plant is whether any heat recovery coke plants have a second set of control devices to specifically address periods of bypass venting during necessary inspection and maintenance of equipment. As previously explained, the costs for control of emissions at the proposed plant are at least the same, if not greater than the costs at existing heat recovery coke plants.[116]

134. The control alternative for bypass venting include spray quenches, additional heat recovery steam generators, individual dry scrubbing systems and individual wet scrubbing systems. These are widely used on numerous plants in comparable industries, including petroleum refineries, coal-fired boilers, and other emission units at steel mills. The application does not contain any demonstration that costs for the subject coke plant are unusual or that the costs would prevent the coke plant from being built. The costs of the quenching options, for example, are a small fraction of the total cost of the new coke plant. Thus, LAER controls on venting emissions cannot be eliminated based on costs.

These types of devices are not routinely used at other sources in circumstances similar to those at the proposed plant, as claimed by this comment. In addition, such devices are not used on heat recovery coke plants. The circumstances of bypass venting at the proposed coke plant are appropriately examined by comparison to other units that operate at high temperatures that "cannot be turned off" due to the damage to the unit that would result.[117] Finally, the costs of the secondary control systems would also not be insignificant, when appropriately considered on an annualized basis, rather than compared to the initial capital cost of the plant.

135. Costs are overestimated. Errors in the economic analysis include: (1) the use of a 10 year equipment life for all of the control options when 20 to 30 years is appropriate; and (2) sales and property taxes on

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establish that limit as LAER for a proposed unit. If another unit in the same (or comparable) industry already uses that control technology, then such use constitutes evidence that the cost to the industry of that control technology is not prohibitive. Thus, for a new source, LAER costs are considered only to the degree that they reflect unusual circumstances which, in some manner, differentiate the cost of control for a source from control costs for the rest of the industry.

[116] **It is appropriate to expect that various features of the permit for the proposed plant will increase costs for control of emissions as compared to those at existing plants. These additional costs include direct costs for more sophisticated and thus more expensive filter media. In addition, the additional testing and monitoring required of the proposed plant will also result in higher costs.**

[117] **The NSPS for glass manufacturing plants, 40 CFR 60, Subpart CC, exempts affected facilities from otherwise applicable standards for particulate matter for up to 6 days per calendar year while routine maintenance of add-on air pollution control equipment is performed. The permit for the proposed plant requires that similar maintenance activity be accomplished in 5 days.**

pollution control equipment, which we understand to be exempt in Illinois.

The recommended changes to the economic factors used in the cost-effectiveness analysis for alternative add-on control devices not would alter the conclusions of the analysis. This is because of the magnitude of the capital costs of such devices and the fact this cost is only one component of the annualized cost of control.[118]

136. Costs of the alternative options are also overestimated because (1) a PM_{10} control efficiency of 83% was used for all options when much higher control efficiencies are feasible, up to 99.99% for baghouses; (2) uncontrolled PM_{10} emissions of only 19.75 ton/yr when the emission summary in the draft coke plant permit reports 30.24 ton/yr; (3) omission of venting emissions from dry scrubber maintenance; and (4) the spray quench options, the lowest cost options, was only considered in combination with a dry scrubber. However, a spray quench system is a form of wet scrubber and can be designed by itself for high particulate removal efficiency, up to 99%.

These comments appear to reflect misunderstandings about the types of alternatives that were evaluated. Two types of alternative options were evaluated, stand-alone alternatives and "bridging" alternatives. The elements of the analysis differed based on the type of alternative that was evaluated. "Spray quench" was a bridging alternative, which would service in place of the heat recovery steam generator to cool the exhaust so that it could then be sent to the control system for the main stack. Accordingly, with this option, the benefits of the main control system would only be present for bypass for maintenance of the heat recovery steam generators. Bypass venting would still occur during maintenance of the main control system. Accordingly, cost-effectiveness for this alternative was appropriately evaluated only for the reduction that would occur from control of during maintenance of heat recovery steam generators.

For stand-alone alternatives, it was necessary to adjust for the fact that the charging rate, and thus emissions, during maintenance of the main control system must be reduced by 17 percent. Accordingly, the reduction of the stand-alone option is 83% of the reduction that would occur without the reduction in the charging rate.

The spray quench system proposed by this comment would be a stand-alone option, rather than a bridging option. When used as a stand-alone option, a spray quench system would not provide a significant reduction in particulate emissions. This is because spray quenching is not a form of scrubbing that is effective for control of particulate emissions.[119]

137. Spray quenches can control not only particulate matter, but also SO_2, sulfuric acid mist, and VOM. The cumulative emission reductions of all

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[118] US Steel used a capital recovery factor of 0.11756 based on a 20 year equipment life and an annual interest rate of 10 percent. At an annual interest rate of 7 percent, the capital recovery factors are still 0.0944 and 0.0806 for equipment lives of 20 and 30 years, respectively.

[119] For a "scrubber" to achieve effective control of particulate emissions, it must be designed to provide mixing of fine water droplets and the exhaust stream. This does not occur in a spray quench as the large water droplets. Scrubbers for control of particulate are typically packed tower or high-energy Venturi scrubbers.

pollutants should have been considered in the cost analysis for spray quenching, not just PM_{10} reductions. This would reduce the cost effectiveness of the spray quench options by over an order of magnitude.

While consideration of multi-pollutant cost-effectiveness is not required in the control technology analysis, as suggested by this comment, it would not significantly alter the cost analysis for quenching. This is because spray quenching is not a particularly effective control technology for either SO_2 or sulfuric acid mist. Enhancing the spray quench system to provide meaningful control for these pollutants would certainly increase the cost of the quench system, canceling out any significant gain in cost-effectiveness from additional emission reductions. Emissions of VOM are not even appropriate for consideration. VOM emissions do not change with bypass venting, as VOM emissions are controlled by the nature of the coking process and the afterburner tunnels, which are upstream of the heat recovery steam generators.

138. Water quenching was selected as BACT for control of PM_{10} emissions from cooling of hot coke. It is not clear why a spray quench system is not cost effective for cooling hot flue gases but is cost effective for controlling $PM_{10}/PM_{2.5}$ emissions for cooling hot coke. This disparity calls into question the reasonableness of the gas quench cost analysis.

Water quenching was not selected as BACT/LAER for quenching of hot coke. Water quenching is the process by which hot coke is rapidly cooled. Coke quenching is performed with a water spray, with large water droplets, with the objective of minimizing loss of water droplets from the tower. One element of the BACT/LAER determination for the quenching process is use of clean water for the quenching process, as solids in the water used for quenching are a source of particulate emissions. The other element of the BACT/LAER determination is an improved baffle design in the spray tower to more effectively minimize loss of water droplets, with their entrained solids.

Moreover, water sprays may be effective for cooling exhaust streams in preparation for treatment by other control devices. However, by themselves, they are not especially effective for removal of PM_{10} from exhaust stream. This is because removal of particulate with scrubbing depends upon intimate contact between the particulate and small droplets of water. Accordingly, in situations where scrubbers are used for control of particulate, high-energy scrubbing systems, such as Venturi scrubbers, are installed, not water spray systems.

139. The costs for all the alternatives are scaled from equipment purchase costs for a system designed to handle flows from 20 ovens at a 100-oven coke plant. The basis for cost estimates for equipment should be further documented, either with data supplied by an equipment vendor (i.e., budget estimates or bids) or by a referenced source. The equipment costs were estimated by extrapolating or scaling costs from earlier quotes for the smaller system. The accuracy of the cost estimates in this instance cannot be evaluated without the underlying vendor proposals.

The levels of documentation provided for cost estimates are adequate given the results and the circumstances in which they are being made. Cost estimates are being made for theoretical configurations of control systems that have not been applied in actual practice. Moreover, it is unrealistic to expect meaningful vendor proposals to be provided to support the economic analysis. Due to practical consideration, vendors of control equipment only provide detailed cost proposals when there is a reasonable possibility that a source might

actually purchase equipment. They are reluctant to participate in the type of academic evaluations that were required as part of the control technology analysis for bypass venting.

140. The Project Summary for the proposed coke plant indicates that although Illinois has no legal standards for mercury emissions from coke ovens, Illinois EPA "… recognizes the need to address the mercury emissions from the proposed plant." However, the draft permit would only require the activated carbon injection system on the main stack of plant to achieve "an overall mercury control efficiency equivalent to 90 percent, in conjunction with other control measures for the batteries." The draft permit would not set specific limits on mercury emissions. Accordingly, the provisions in the draft permit for mercury emissions would not be enforceable as a practical matter.

This comment does not show that the provisions in the permit for mercury emissions would be unenforceable, or inappropriate. The absence of emissions limits for mercury does not make the provisions for control of mercury emissions in the draft permit unenforceable. Indeed, the provisions for mercury emissions, as generally reflected in the issued permit, are readily enforceable. To control mercury emissions, an activated carbon injection system must be operated on the main stack at a rate of 10 pounds of activated carbon per million actual cubic feet of exhaust gases. Alternatively, the control system must achieve at least 90 percent overall control efficiency for mercury. The first requirement may be directly verified by monitoring the operation of the activated carbon injection system. The alternative requirement may also be verified by monitoring of relevant operating parameters of the control system to verify that the system is being operated in manner that has been demonstrated by emissions measurements to be sufficient to achieve a 90 percent reduction overall in mercury emissions.

141. Has Gateway provided information explaining how 90 percent control efficiency for mercury will be ensured with the activated carbon injection system? Where does the 90 percent efficiency come from?

The requirement for 90 percent control of mercury emissions, as well as the alternative requirement for injection of activated carbon, were not developed or proposed by Gateway. These requirements were developed by the Illinois EPA based on its knowledge of control of mercury emissions at coal-fired power plants, which indicates 90 percent control of mercury emissions is achievable at coal-fired power plants with activated carbon injection.[120] The Illinois EPA requested data on the probable effectiveness of activated carbon injection at the proposed plant but Gateway explained that it is simply not available. Gateway is installing such a system at its existing plant in Haverhill, Ohio, but installation is not yet complete and emission test data is not available.

142. Why wouldn't the draft permit for the coke plant set limits for mercury emissions? The permit should establish both hourly and annual limits on mercury emissions, in addition to the requirement for control efficiency. Control efficiency alone does not provide a meaningful limit because mass

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[120] **A concise summary of the Illinois EPA's evaluation of control of mercury emissions from coal-fired boilers is contained in the Illinois EPA's Technical Support Document for proposed 35 IAC Part 225, Subpart B, which establishes emission standards for the mercury emissions from such units, "Technical Support Document For Reducing Mercury Emissions From Coal-Fired Electric Generating Units," Air Quality Planning Section, Division Of Air Pollution Control, Illinois EPA, March 14, 2006.**

emissions can still increase.

At this time, emission data is not available upon which the Illinois EPA may reasonably set meaningful limits on the mercury emissions of the proposed plant that consider the use of an activated carbon injection control system, as required by the permit. The limits on mercury emissions that could appropriately be set based on available information could likely greatly understate the control of emissions that is reasonably achieved by the activated control system and the spray dryer/baghouse control system on the main stack. In such circumstances, the proper course of action for the Illinois EPA is to defer the establishment on limits on mercury emissions until information is available upon which to set appropriate limits.

Even though the emission control requirements that have been set do not directly limit the mass of emissions, they are nevertheless meaningful limits. Emission control requirements are routinely imposed on emission units to restrict their emissions. In this case, the emission control requirements for mercury function with other aspects of the design and operation of the proposed plant, including the limit on the plant's annual usage of coal, to restrict the mass of mercury emitted by the plant.

143. The Ohio EPA has set limits on the mercury emissions of the proposed heat recovery coke plant being planned by FDS Coke in Toledo, Ohio. The construction permit recently issued for that plant (which would be larger than the Gateway plant) would limit mercury emissions from the main stack to 0.006 lbs/hour and 36 lbs/year. While the permit would allow FDS to petition for revisions to these limits, this permit provides an example of a construction permit for a proposed heat recovery coke plant with limits on mercury emissions. The Illinois EPA should do the same for the proposed plant, rather than setting limits in the future.

The Illinois EPA understands that from a technical perspective, the circumstances of the FDS plant and the proposed plant are similar. However, under Illinois law, it is not appropriate for the Illinois EPA to issue a permit for the proposed plant that sets limits for the rate of mercury emissions as was done for the FDS plant. In particular, requirements can be set that serve to control emissions of mercury, consistent with the capabilities of control technology that is currently available, without setting limits on the mass of emissions that may not be achievable in practice. In this regard, it is significant that the permit for the FDS plant contemplates revisions of the limits that were set for that plant. Moreover, it is unclear precisely what the permit for the FDS plant requires for such revisions to be made. Arguably, the permit provides for revision of the limits for mercury emissions based simply on the results of emissions testing.[121] As this is the case, the FDS permit provides support for the approach taken by the Illinois EPA for the permitting of the proposed plant.

144. Before issuing a permit for the proposed plant, the Illinois EPA must

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[121] **Condition II.A.I.2.u of the draft permit for the FDS plant states "Since there is not much information available on lead and mercury emissions from non-recovery coke ovens, Ohio EPA may increase the lead and/or mercury emission limitations based on the results of lead and mercury emissions testing to be conducted under Section A.V." Condition II.A.I.2.t of the draft permit, which addresses operation of an activated carbon injection system on the FDS plant, provides for revision of allowable mercury emission limitations "... if the permittee demonstrates to the satisfaction of the Permittee that the activated carbon injection control system has been optimized within the limits of this paragraph."**

require adequate data from Gateway to demonstrate that the required mercury control system will work as promised. The draft permit for the coke plant states that an activated carbon injection system must be operated to achieve a mercury control efficiency of 90 percent, or at maximum activated carbon injection rate of 10 pounds per million actual cubic feet of exhaust gases or less as necessary.

This comment illustrates the flaw in setting limits at this time for mercury emissions from the proposed plant. While limits on emissions of mercury emissions are desired that reflect achievement of at least 90 percent control, substantial supporting data is also desired to show that such limits can be achieved in practice. However, no such data is available for heat recovery coke plants. By way of contrast, the electric utility industry, USEPA and the US Department of Energy have been working for close to a decade on development, evaluation and implementation of control technology for the mercury emissions from coal-fired utility boilers.

145. The permit for the proposed plant should require Gateway to demonstrate optimization of the control system for mercury emissions as part of any request for revision of the mercury emission limits.

As already explained, the permit does not set limits for mercury emissions. Accordingly, the permit need not address applicable criteria for any future revision of limits. However, the issued permit would require that the mercury emission data collected for the plant be accompanied by information from Gateway demonstrating that the control systems were properly operated for effective control of mercury while data was being collected. It also allows for operation at reduced rates of activated carbon during testing of emissions, as measurement at varying carbon injection rates will be necessary to evaluate and optimize the performance of the carbon injection system.

146. The draft permit would be ambiguous as to whether the critical requirement is 90 percent control or operation of an activated carbon injection system. The permit should be clear that neither requirement can be used to undermine the other. That is, if the activated carbon injection system achieves greater than 90 percent control of mercury, then the emission limits must be based on that greater degree of control. Conversely, if the activated carbon injection system does not achieve 90 percent control for mercury, Gateway must implement other methods (e.g., a combination of carbon injection, use of other sorbents, coal specifications, and scrubber operation) to achieve 90 percent control.

The draft permit is not ambiguous on the requirements for control of mercury emissions, as the two requirements are clearly expressed as alternatives. This is appropriate.

While the Illinois EPA shares the spirit of this comment as it reflects a desire for maximum control of mercury emissions, it would not be appropriate to embody it in the permit in the manner suggested by this comment. In this regard, the Illinois EPA anticipates that the plant will be able to achieve at least 90 percent control of mercury emissions, consistent with regulatory requirements adopted for coal-fired power plants in Illinois. The alternative requirement for control of mercury emissions, injection of activated carbon at 10 pounds per million actual cubic feet of exhaust, would ensure that if 90 percent control is not achievable, Gateway would be expending substantial and significant efforts to minimize mercury emissions. Thus, this requirement would also provide a continuing incentive for Gateway to make improvements to the

mercury control measures at the plant until 90 percent control can be achieved.

147. While the draft permit for the proposed coke plant would set requirements for control of mercury emissions, it would not let the public review and comment on proposed mercury emissions limits until after the plant has been operating for at least a year. This circumvents the requirement for public participation, 35 IAC 203.150, because the public cannot comment effectively on limits that have not yet been formally proposed.

The public has been provided with an opportunity to comment on the initial requirements for mercury emissions that would apply to the proposed plant. The cited rule, 35 IAC 203.150, does not mandate that the public have an opportunity to review and comment on the further provisions for the mercury emissions of the coke plant before they are set. The cited rule provides for public comment periods prior to issuance of NA NSR permits. However, the conditions of the permit for emissions of mercury, for which areas are not designated either attainment or nonattainment, are not conditions pursuant to the NA NSR rules. They are outside the scope of the NA NSR permit for the proposed plant, which addresses emissions of particulate. That said, however, the commenter's desire that the public have an opportunity to formally comment on the further requirement for mercury has been noted by the Illinois EPA and will be a considered a request for a public comment period prior to revision of the permit to include emission limits for mercury. In this regard, the Illinois EPA can as a general matter hold a public comment period prior to issuance of a construction permit if requested by the public when the proposed action is determined to be the subject of public interest.

148. Did the Illinois EPA consider requiring injection of activated carbon that has been treated to enhance its ability to collect mercury?

The Illinois EPA has considered imposing such a requirement. Upon consideration, the Illinois EPA has concluded that such a requirement is not needed. This is because the feedstock for the coke plant will be bituminous coal. The control requirement in terms of the rate of activated carbon injection requires that activated carbon be injected at a rate of 10 pounds per million actual cubic feet of exhaust. These are circumstances, unlike use of low-sulfur Powder River Basin coal, in which use of treated activated carbon has not been found to be important for maximizing control of mercury emissions.

149. Where has the Illinois EPA documented its decision leading to the requirements for the activated carbon injection system?

The Illinois EPA's decision concerning requirements for an activated carbon injection system is explained in the Project Summary for the draft permit for the coke plant and in this Responsiveness Summary. The technical information that supports this decision is contained in the Pollution Control Board's record for adoption of Illinois' rules for control of mercury emissions from coal-fired power plants, R2—6-025. A summary of relevant technical data concerning control of mercury for coal-fired power plants is contained in the *Technical Support Document For Reducing Mercury Emissions From Coal-Fired Electric Generating Units*, Air Quality Planning Section, Division Of Air Pollution Control, Illinois, EPA March 14, 2006.

150. Is the activated carbon injection system the only control device for emissions of mercury?

Activated carbon is the only technique that is being used specifically for

control of mercury emissions. However, the use of a spray dryer absorber and baghouse on the main stack will also act to control mercury emissions. Based on emission data from coal-fired utility boilers firing bituminous coal, the combination of these control devices could provide 90 percent control of mercury emissions by themselves. If in fact this is the case, the activated carbon injection system may provide little or no additional control. If the spray dryer absorber and baghouse are not as effective in controlling mercury emissions, the activated carbon injection would be relied upon to supplement the control provided by the spray dryer absorber and baghouse.

151. What is the basis for the projected mercury emissions of the coke plant in the first revision to the coke plant application, which lists emissions as 298 pounds per year?

This data was a worst-case estimate of the total mercury emissions of the proposed plant, including particulate, oxidized, and elemental mercury, but without any control measures specifically targeting mercury emissions. It was developed using an emission factor from Chapter 12.2: Coke Production (draft) in USEPA's *Compilation of Air Pollutant Emission Factors*, AP 42, which was only reduced by 20 percent to very conservatively account for some control of mercury by the spray dryer/baghouse control system.

152. How much mercury is emitted during bypass venting? Has Gateway done any study as to the projected mercury emissions during bypass venting?

The emissions during bypass venting can be readily estimated from the mercury content of the coal assuming that all mercury in the coal is lost as emissions. On this basis, the potential emissions of mercury from bypass venting, based on the allowed duration and volume of venting, would be no more than 8 pounds per year. These emissions are appropriately being minimized by the measures that are required to reduce the duration and volume of bypass venting.

153. How much mercury is going to be emitted by the coke plant?

With 90 percent control of mercury emissions, as targeted by the permit, the Illinois EPA expects that the actual mercury emissions of the proposed plant would be less than 45 pounds/year.

154. The permit for the coke plant should require monitoring of mercury emissions from the main stack with a sorbent trap system, in accordance with 40 CFR 75.15. The permit must also establish procedures for determining compliance with any emission limits that are set.

The issued permit includes provisions for measuring mercury emissions of the plant, as were also present in the draft permit. To collect the data needed to set limits on mercury emissions, emissions must be monitored using a sorbent trap system or other mercury monitoring system in accordance with USEPA rules for monitoring mercury emissions from coal-fired power plants (Conditions 4.1.6(b)(iii)(B) and 4.1.7(c)). The coal supply to the plant must also be sampled and analyzed for its mercury content (Condition 4.1.7(b)(iv)(B)).

It would generally not be appropriate for the permit to set further procedures for determining compliance with emission limits for mercury until actual measurements are conducted for mercury emissions and emission limits for

mercury are being set.[122] However, because of concerns about emissions of mercury expressed by the public, Gateway has requested that the permit require continuous monitoring of the main stack for mercury be conducted on an ongoing basis. In the issued permit, the Illinois EPA has generally proceeded as requested by Gateway. However, the permit also notes that the future circumstances could be such that either less rigorous or more rigorous approaches to such monitoring should be allowed or required.

155. The provisions of the draft permit for the coke plant that would set a methodology for determining mercury emissions are inadequate. Gateway is left to devise its own methodology; the only enforceable aspect of the draft permit is that Gateway must collect six months of data within the first nine months after startup. In contrast, the draft FDS permit sets a straightforward process for determining mercury emissions.

As already explained, the issued permit, as well as the draft permit, generally require that Gateway determine mercury emissions using specific methods for monitoring mercury emissions developed by USEPA or adaptations of those methods approved by the Illinois EPA. In this regard, Gateway is required to conduct monitoring for mercury emissions from the main stack of the proposed plant using methodology developed by USEPA for monitoring of mercury emissions at coal-fired power plants, which are set forth in regulations adopted by USEPA in 40 CFR Part 75. This is required notwithstanding the fact that the related federal regulations adopted by USEPA for control of mercury emissions from coal-fired power plants were recently vacated by the federal courts.[123] The further question is whether use of such monitoring methods should be required after the initial period of data collection. As also explained, if appropriate, this question can be revisited, in the future in conjunction with setting limits on the plant's mercury emissions, based on the initial emission data that is collected and associated operational informational. This emission data will provide relevant information upon which to select an appropriate monitoring methodology for use on a continuing basis to assure proper functioning of the control system for mercury and to determine actual mercury emissions. The establishment of this "permanent" methodology will also be part of the process of establishing numerical limits on mercury emissions.

156. The permit for the coke plant should require that emissions testing be conducted for the main stack for emissions of $PM_{2.5}$, with limits to then be set based on the results of such testing. As this approach has been taken for emissions of mercury, a similar approach should also be used for emissions of $PM_{2.5}$.

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[122] **The specific aspects of control system operation that are important for control of mercury emissions will not be fully understood until data for mercury emissions is actually collected by the required monitoring system for mercury. In particular, if the required level of control for mercury emissions is shown to be readily achieved with proper operation of the spray dryer system for control of SO_2 emissions, it would not be appropriate to establish compliance procedures that focus on the operation of the activated carbon injection system or require continuous emissions monitoring.**

[123] **In response to a successful challenge of the approach taken by USEPA in adopting the federal "Clean Air Mercury Rule" (CAMR), the CAMR rules were recently vacated. Based on the Court's decision, USEPA must now undertake adoption of regulations for control of mercury emissions from coal-fired power plant that represent Maximum Achievable Control Technology (MACT), in accordance with provisions of Section 112 of the Clean Air Act.**

The circumstances surrounding emissions of mercury and emission of $PM_{2.5}$ differ in critical ways[124] so that the approach recommended by this comment could not be taken in the permit without the consent of Gateway. However, because of concerns expressed by the public about emissions of $PM_{2.5}$ from the proposed plant, Gateway has requested that the permit include the requirements suggested by this comment. In particular, Gateway requested that the permit require a series of at least three emissions tests for emissions of $PM_{2.5}$ followed by the establishment of emission limits for $PM_{2.5}$. Gateway proposed that such testing be completed and limits be proposed for $PM_{2.5}$ emissions within 42 months after commencing operation of the coke plant. (This period of time is presumably needed to collect data that addresses normal variability in $PM_{2.5}$ emissions of the main stack as well accommodate the greater complexity of emissions testing, as compared to continuous monitoring.)

The issued permit includes the conditions for testing of emissions of $PM_{2.5}$ requested by Gateway. It also accommodates the possibility that limits for emissions of $PM_{2.5}$ could be set as a result of such testing. However, the decision whether limits will be set for $PM_{2.5}$ emissions is deferred until the results of the required emissions testing, along with other relevant information about particulate emissions, emissions testing for $PM_{2.5}$, and operation of the control system for the main stack, have been compiled. The issued permit then specifies the criteria that would have to be met before Gateway would be required to apply for a revision to the permit to include limits for emissions of $PM_{2.5}$. First, establishment of emission limits for $PM_{2.5}$ cannot be inconsistent with applicable laws and rules that govern at that time. Second, reliable and reproducible measurements of $PM_{2.5}$ emissions must be capable of being made so as to enable limits to be set in terms on $PM_{2.5}$. Third, implementation of such limits on a continuing basis must be practical. Lastly, such limits must be significantly lower than emission limits in terms of PM_{10} so as to justify any additional effort that would accompany the ongoing implementation of such limits. Whether these criteria will be met, is not currently known and will not be known until the required program of emission testing for $PM_{2.5}$ is completed. Thus, it was not appropriate for the Illinois EPA in the issued permit to include a requirement mandating that emission limits for $PM_{2.5}$ be set in the future based on the results of the emission testing that is required.

157. Why didn't Gateway address emissions of carbon dioxide (CO_2) in the application for the proposed coke plant and why didn't the Illinois EPA evaluate CO_2 emissions when reviewing the application?

Gateway did not provide data for CO_2 emissions in its application and the Illinois EPA did not perform any evaluation of CO_2 emissions because CO_2 is currently not a pollutant regulated under the Clean Air Act. Accordingly, there is not a legal basis for requiring information on CO_2 emissions to be part

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[124] **The circumstances of mercury and PM2.5 differ significantly as emissions of PM2.5 can readily be addressed by using emissions of PM10 as a surrogate. Given its physical and chemical properties, there is not a surrogate for mercury, which can be emitted both in gaseous and particulate form and in several valence states. In addition, as compared to PM2.5, measurement methods for mercury emissions are well-developed, given the work that has been performed in preparation for CAMR. As monitoring methodology is available for mercury, a substantial body of emission data for mercury can be readily collected in a short period of time, with a level of effort that is not excessive. Lastly, limits for emissions of mercury have been set for certain emission units. The State of Illinois has adopted emission standards for control of mercury emissions of coal-fired power plants in Illinois. Standards have not been adopted in Illinois or set for other units in Illinois for emissions of $PM_{2.5}$.**

of the application nor is there a reason for the Illinois EPA to perform an independent evaluation for emissions of CO_2.

While emissions of CO_2 and greenhouse gases were not addressed during permitting of this project, this does not mean that they are not of concern, only that the permit for this project is not currently a means by which they can be addressed. In particular, in 2006, Governor Blagojevich announced a climate change initiative by the State of Illinois to address emissions of greenhouse gases, to build on Illinois' role as a national leader in protecting public health and the environment. The Illinois Climate Change Advisory Group has evaluated a full range of policies and strategies to reduce Illinois' emissions of greenhouse gases and is finalizing its report to Governor Blagojevich. This initiative marks the beginning of serious efforts by Illinois to address global climate change and builds on steps that Illinois was already taking to lower emissions of greenhouse gases, such as providing incentives for energy efficiency and encouraging the use of wind power and biofuels.

At the same time, until specific regulations are put into place by Illinois or on a national level, ad-hoc action to address global warming by projects like this proposed project through conventional environmental permitting programs would be capricious. Even if such action were taken, it would probably provide only illusory benefits, as it would not reach or affect existing sources, which contribute the majority of emissions of concern. Such action might also have a stifling effect on the continuing development and deployment of new technology to improve energy efficiency and reduce emissions of greenhouse gases.

158. The federal Clean Air Act requires the Illinois EPA to set Best Available Control Technology (BACT) limits in the permit for the proposed coke plant for emissions of CO_2 and other greenhouse gases. This is because a PSD permit for a proposed major project must set BACT limits for each pollutant subject to regulation under the Clean Air Act that would be emitted in a significant amount. In April 2007, the Supreme Court resolved any doubt on this question and held that CO_2 and other greenhouses gases are air pollutants under the Clean Air Act.[125] Moreover, the Court's ruling makes clear that CO_2 and other greenhouse gases are "subject to regulation" under the Clean Air Act. The Supreme Court's ruling is important here because the Court held that the definition of "air pollutant" in the Clean Air Act encompasses CO_2 and other greenhouse gases Second, the Court's held that the USEPA has the statutory authority to regulate the emissions of these pollutants, which indicates that they are "subject to regulation" under the Clean Air Act.

This comment reflects a flawed understanding of the United States Supreme Court's ruling in *Massachusetts v. EPA*, 127 S.Ct. 1438, 167 L.Ed.2d 248 (2007). According to the comment, the Supreme Court's ruling in the *Massachusetts* decision established that "greenhouse gases are 'subject to regulation' under the Clean Air Act." However, this assertion is not supported by even the most basic reading of the Court's opinion. The facts in the case centered around

[125] In Massachusetts v. EPA, 127 S. Ct., the Supreme Court found that "The Clean Air Act's sweeping definition of "air pollutant" includes 'any air pollution agent or combination of such agents, including any physical, chemical ... substance or matter which is emitted into or otherwise enters the ambient air …' §7602(g) (emphasis added). On its face, the definition embraces all airborne compounds of whatever stripe, and underscores that intent through the repeated use of the word 'any.'" p. 1438

"Carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons are without a doubt "physical [and] chemical . . . substance[s] which [are] emitted into . . . the ambient air. The statute is unambiguous." p. 1460.

USEPA's refusal to grant a rulemaking petition, initiated by states and other interested parties under Title II of the Clean Air Act, that proposed mobile source emissions standards for CO_2. In support of its decision, USEPA argued, among other things, that greenhouse gases did not fall within the scope of the definition of "air pollutant" in the Clean Air Act and that the overall statutory scheme of the Clean Air Act did not evidence congressional intentions to regulate such gases. The Supreme Court rejected USEPA's argument, finding instead that CO_2 and other greenhouse gases fell within the "capacious definition" of "air pollutant" in the Clean Air Act. *See, Massachusetts v. EPA,* 127 S.Ct. at 1462. As such, the Court rejected USEPA arguments and found that USEPA possessed the necessary authority to regulate greenhouse gases emitted by new motor vehicles.

However, while the Court's ruling recognized that CO_2 emissions may be considered an air pollutant, USEPA has yet to make any final judgment that CO_2 emissions cause "air pollution" under Title II of the Clean Air Act or, more relevant here, under the PSD program found in Title I.[126] Moreover, the Court's ruling does not address or give meaning to the phrase "subject to regulation." The thrust of this comment is that CO_2 is "subject to regulation" and, hence, that emissions of CO_2 must be addressed with a BACT limit. However, the Supreme Court's ruling, while significant in its own right, did not directly address this issue. In this regard, the phrase "subject to regulation" is not the same as the term "air pollutant." The terms are plainly different and possess separate usages, each denoting a different thing or concept. An attempt to blur one term with the other would render one or the other term superfluous. The proper meaning of the phrase "subject to regulation" must rest on its own statutory construction, rather than on the clarification of the meaning of the term "air pollutant" provided by the *Massachusetts* ruling.

159. BACT limits must also be established for the project's emissions of CO_2 because CO_2 is also "subject to regulation" under the Clean Air Act as CO_2 is already regulated under the Act's acid rain provisions.[127] Recordkeeping and reporting requirements constitute "regulation," so CO_2 is currently regulated under the Clean Air Act. A position that CO_2 is not "subject to regulation" because neither USEPA nor Illinois has yet set standards for CO_2 emission is unfounded. USEPA has stated: "Technically, a pollutant is considered regulated once it is subject to regulation under the Act. A pollutant need not be specifically regulated by a Section 111 or 112 standard to be considered regulated." USEPA, Change to Definition of Major Source, 66 FR 59161, 59163 (Nov. 27, 2001)

This comment is also based upon a flawed understanding of the meaning of the phrase "subject to regulation" as found in both the Clean Air Act and in the

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[126] **The Court's ruling clearly says as much, observing throughout the majority opinion that the first step for initiating a Title II rulemaking (i.e., a finding of endangerment) has yet to occur. *See,* 127 S.Ct. at 1459 ("… the first question is whether §202(a)(1) of the [CAA] authorizes EPA to regulate greenhouse gas emissions from new motor vehicles *in the event* that it forms a 'judgment' that such emissions contribute to climate change {emphasis added})."**

[127] In 1993, USEPA promulgated regulations requiring coal-fired power plants to monitor CO_2 emissions and report data to USEPA. 40 CFR Part 75. The regulations generally require monitoring of CO_2 emissions through the installation, certification, operation and maintenance of a continuous emission monitoring system or an alternative method, 40 CFR 75.1(b) and 75.10(a)(3), maintenance of certain records, 40 CFR.75.57, and reporting of information to USEPA, including electronic quarterly reports of CO_2 emissions data, 40 CFR 75.60 through 75.64.

definition of "regulated NSR pollutant" in the PSD rules. The comment contends that the phrase "subject to regulation" cannot be restricted to pollutants for which emission standards have not been developed. To support this position, the comment refers to language in the preamble from rulemaking by USEPA, "Technically, a pollutant is considered regulated once it is subject to regulation. A pollutant need not be specifically regulated by a Section 111 or 112 standard to be considered regulated." ***See, 66 FR 59161, 59163*** (Nov. 27, 2001). However, the quoted language merely states the unremarkable proposition that once emissions of a pollutant from one category of emission unit are regulated by adoption of emission standards for such units, emissions of that pollutant are considered to be regulated as a general manner. Emission standards do not need to be adopted for the emissions of the pollutant from other categories of emission units for emissions of the pollutants from those other units to also be considered regulated. The cited passage does not support the broader interpretation argued for in the comment. In addition, a look at context reveals the comment's misplaced reliance on this statement by USEPA.[128]

The USEPA considers the phrase "subject to regulation" in the Clean Air Act and the PSD rules to address those pollutants for which substantive emission limits (or actual control requirements) are established, rather than, as suggested by the comment, any manner of requirements. This usage is well established. For example, USEPA issued a guidance document in 1993 that discussed the types of pollutants "subject to regulation" under the Clean Air Act.[129] ***See,*** Memorandum from Lydia N. Wegman, USEPA's Office of Air Quality Planning and Standards to USEPA's Air Division Director for Regions I-X, dated April 26, 1993. In the memorandum, USEPA confines its discussion of regulated pollutants to pollutants for which emissions standards have been adopted or, more precisely stated, involve the "actual control of emissions." Significantly, in that same memorandum, USEPA expressly declined to consider CO_2 a regulated pollutant, notwithstanding certain elements of the acid rain program calling for the study and reporting of CO_2. This shows that the USEPA has applied the term "subject to regulation" to mean actual control of emissions. This has not occurred for CO_2 emissions under the acid rain program, which only provides for reporting of

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[128] The passage is from rulemaking that involved USEPA rules for implementation of permitting under Title V of the Clean Air Act and proposed changes to the definition of "major source" dealing with the catch-all source categories regulated by Sections 111 and 112 of the Clean Air Act. In context, it is clear that USEPA was addressing a particular comment that interpreted part of the proposal to allow for the counting of fugitive emissions for unregulated pollutants in making a major source determination. The affected proposal sought to delete the phrase "but only with respect to those air pollutants that have been regulated for that category" from the catch-all provision for all other source categories regulated under Sections 111 and 112. See, 40 CFR 70.2(2)(xxvii). USEPA's response sought to allay concerns that deleted language from the rulemaking proposal would introduce "unregulated" pollutants into major source deliberations. In this regard, the underlying rationale of USEPA's quotation was twofold: first, that only "regulated" pollutants (i.e., those pollutants subject to regulation") can be considered in the major source determination, and second, that pollutants other than those captured by the catch-all source categories (i.e., categories regulated by Sections 111 and 112) are capable of making a source major under Part 70. This interpretation is further supported by USEPA's citation to another rulemaking, which immediately followed the last sentence in the quotation but is not referenced by the commenter's excerpt. In a proposal to revise requirements for the New Source Review programs, USEPA discussed several pollutants promulgated under Section 112 that were no longer subject to the PSD program's requirements and, conversely, identified a list of regulated pollutants that remained subject to the program, including those pollutants comprising the NAAQS and substances regulated by Title VI.

[129] The memorandum addressed this issue in the context of Title V permitting, however, the document confirmed the similarities in treatment with the PSD program.

data for CO_2 emissions. The USEPA's usage for the phrase "subject to regulation" is also confirmed by actions by USEPA in other rulemakings.[130]

Finally, even assuming for purposes of argument that the statutory language is ambiguous, "subject to" and "regulation" are words of general usage and the particular meaning of terms can be either broadened or curbed depending upon the desired application. In the absence of clarity, an administrative agency charged with implementing a particular statute is afforded discretion in construing congressional text and that discretion is usually not disturbed by courts unless the agency's construction is found unreasonable.

160. The draft permit for the proposed coke plant would not require adequate testing, monitoring and recordkeeping[131] related to the plant's emissions of NOx, CO, VOM, SO_2, lead and sulfuric acid mist as needed to ensure that the plant would not be a major modification for these pollutants under the PSD and NA NSR rules. Limits on emissions that are set to address applicability of NSR must be federally enforceable and emission limits are only considered federally enforceable if they are enforceable as a practical matter.[132]

The compliance procedures in the issued permit are more than adequate to verify that the proposed plant complies with applicable emission standards and emission limitations and is not a major project for pollutants other than particulate. Moreover, the issued permit is only the construction permit for

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[130] USEPA also adopted amendments to the PSD rules in 2002 that specifically defined the term "regulated NSR pollutant." *See,* 67 FR 80186 (December 31, 2002). The definition contains four categories of pollutants, three of which comprise pollutants that are specifically addressed by USEPA under significant rulemaking provisions of the Clean Air Act (i.e., NAAQS, NSPS and Title IV). The fourth category of the definition is a catch-all provision that covers "[a]ny pollutant that *otherwise* is *subject to regulation* under the Act…(emphasis added)" *See,* 40 CFR. §52.21(b)(50)(iv). It is this provision that the comment relies on to argue that CO_2 is "otherwise regulated" and is therefore subject to PSD. The argument is plainly mistaken. That each of three specific references in the definition would share a common characteristic (i.e., substantive emission standards or actual controls) lends considerable support for interpreting the catch-all category in a like manner. Not only is such an approach grammatically correct but is also consistent with legal principles employed by courts in construing laws and regulations. (i.e., the rule of *ejusdem generis*). To that end, the pollutants covered by the catch-all category, like those enumerated in the three preceding categories, must be pollutants for which substantive emission standards (or actual controls requirements) have been adopted. Moreover, a list of pollutants accompanying USEPA's final rulemaking identified those pollutants that were then regulated under the Clean Act and potentially subject to the PSD rules. The list did not include CO2 or, for that matter, any other pollutant not already subject to substantive emission standards pursuant to the Clean Air Act.

[131] Compliance with emission limits can only be enforced through appropriate monitoring, testing and recordkeeping. An appropriate hierarchy for determining compliance is: (1) continuous direct measurement where feasible; (2) initial and periodic direct measurement where continuous monitoring is not feasible; (3) use of indirect monitoring, e.g. surrogate monitoring, where direct monitoring is not feasible; and (4) equipment and work practice standards where direct and indirect monitoring are not feasible.

[132] Practical enforceability means the source must be able to show continuous compliance with each limitation or requirement. The USEPA has repeatedly concluded that "in accordance with the 1989 potential to emit policy, when an emission limit is taken to restrict potential to emit, some type of continuous monitoring of compliance with that emission limit is required." In addition, the USEPA has concluded that "[i]n order for emission limitations to be Federally enforceable from the practical stand point, they must be short term and specific so as to enable the Agency to determine compliance at any time."

the proposed plant. The compliance procedures for various units at the plant in the issued permit can be supplemented and enhanced in the Clean Air Act Permit Program (CAAPP) operating permits for the plants if such action is deemed appropriate or found to be necessary based on actual experience with the operation of the plant.

161. The draft permit should require emissions testing for sulfuric acid mist.

The issued permit requires that emission testing include measurements for emissions of sulfuric acid mist.

162. The draft permit would only require one-time emissions testing for CO, VOM, PM, PM_{10}, and lead. This is not adequate. An emissions test normally lasts only a few hours and is conducted under ideal, prearranged conditions. Emissions testing does not measure emissions during routine operation on other days, or during startups and shutdowns, or normal variation in emissions. Emission testing is also generally performed under optimum operating conditions and, as such, does not reflect the full-time emission conditions from a source.[133] A single stack test does not provide any method to assure that emission limits are met on a continuing basis.

As already explained, the issued permit for the plant is a construction permit. As such it established requirements for the initial emission testing for emission units at the plant after construction is complete to confirm that they comply with applicable emission standards and emissions limitations. It is not appropriate for the permit to address the frequency of routine periodic emissions testing, as such matters are better addressed during the processing of the CAAPP Permit for the plant, when the results of the initial emission testing are available. However, in response to this comment, the issued permit requires both initial emission testing to verify compliance with applicable emission limits, followed by a second round of "verification testing" about 24 months later to confirm ongoing compliance. This will provide additional confirmation of initial compliance, as well as provide a better basis for establishing requirements for periodic testing in the CAAPP permit.

Periodic emission testing is routinely accepted as a definitive means to determine compliance in circumstances in which continuous emissions monitoring is not appropriate. To address the deficiencies present with periodic emission testing, as discussed by this comment, other "compensating actions are required when periodic testing is being relied upon." First, emission testing must be conducted at the maximum operating range of a unit, or other conditions, under which it is most difficult for a control device to function effectively. (These operating conditions are typically maximum operating rate, as this is accompanied by maximum exhaust flow rate, so as to have the minimum residence time in the control device.) Second, a unit or its control device is required to be operated in a manner consistent with operating conditions during testing. Accordingly, if testing was conducted during "optimum" conditions, the unit must be operated with optimum conditions on an ongoing basis. Accordingly, it is in the interest of a source to conduct testing under normal, operating conditions, which can be reliably maintained on an ongoing basis.

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[133] A widely-used handbook on Continuous Emissions Monitoring notes, with respect to PM10 testing, observes, "Due to the planning and preparations necessary for these manual methods, the source is usually notified prior to the actual testing. This lead time allows the source to optimize both operations and control equipment performance in order to pass the tests."

163. The draft permit would not require any emissions testing during periods when the spray dryer absorber and baghouse are bypassed for maintenance. Further, the spray dryer absorber must be taken offline for atomizer change out, which occurs at least monthly. Accordingly, the required emissions testing would underestimate emissions and is not sufficient to assure compliance with emission limits.

Emission testing for maintenance bypass would have been required by the draft permit and is required by the issued permit, as it requires testing of emissions from a waste heat stack. This testing will provide measurements of emissions during bypass for both the periodic maintenance of individual heat recovery steam generators and the periodic maintenance of the spray dryer absorber and baghouse. This testing is required because maintenance of this equipment, with emissions occurring through the waste heat stacks, is an alternative mode of operation of the plant that is allowed by the permit. This testing will confirm compliance with the separate set of emission limits that has been set for this mode of operation.

With respect to replacement of atomizers in the spray dryer absorber, this device must be designed so that routine replacements of these absorbers can be performed while the unit continues in operation. Gateway did not request authorization for bypass during routine "monthly" maintenance of the atomizers. In fact, the application indicates that the absorber will be designed so that routine maintenance can be conducted while the unit is on-line.

164. The permit for the proposed coke plant should require continuous monitoring on the main stack for emissions of CO, VOM, and filterable particulate because continuous emissions monitoring can be conducted for these pollutants.

This comment does not provide the technical support that would be needed to impose a requirement for continuous emissions monitoring for CO and VOM. Emissions of CO and VOM will be readily controlled by the "inherent" process characteristics of the coke oven batteries, without reliance on a separate add-on control device. As such, routine operational monitoring conducted by the source should be more than adequate to ensure compliance with limits for CO and VOM emissions. If it is determined that such monitoring should be made "required monitoring," based on the results of emissions testing, that action can be taken in the CAAPP Permit for the plant.

The issued permit requires that a "bag leak detection system" be used to monitor proper operation of the baghouse on the main stack, which is the principal emission unit at the plant. Bag leak detection systems are commonly recognized as an effective means to confirm proper operation of a large process baghouse, like the baghouse on the main stack. The operation of these systems is supported by regulations adopted by USEPA for solid fuel-fired boilers, which the permit applies to the required bag leak detection system.

For the main stack, the issued permit also includes requirements for continuous emissions monitoring for filterable particulate. These requirements have been included at the request of Gateway to address concerns that have been expressed by the public about the ongoing performance of the baghouse on the main stack. The operation of these systems is also supported by regulations adopted by USEPA for new solid fuel-fired boilers, which the permit applies to the required monitoring system. Because the ability of such systems to reliably provide quantitative emission data has not been demonstrated on identical

emission units, this monitoring system would initially be used as another tool for compliance assurance monitoring, like the bag leak detection system, rather than as a direct indicator of the rate of emissions of filterable particulate. In addition, also at the request of Gateway, the issued permit includes provisions whereby continuous emissions monitoring for filterable particulate could be replaced by continuous emissions monitoring for $PM_{2.5}$. This would only occur after such systems are generally found to be feasible by USEPA and the effectiveness of monitoring with such a system on the main stack at the proposed plant has been verified in a period of trial operation.

165. The permit should require more frequent emissions testing for pollutants that are not continuously monitored and indicator monitoring to address routine operation, when emissions testing is not being conducted. All of the other pollutants can be monitored using periodic, at least annual, stack tests and indicator monitoring. Surrogate parameters can be continuously monitored. A surrogate is an indicator parameter that is related to the parameter of interest. These are commonly used in permits to demonstrate continuous compliance with parameters that cannot be monitored by CEMS, e.g., CO is used as a surrogate for VOM, PM_{10} as a surrogate for lead, SO_2 as a surrogate for sulfuric acid mist.

As explained, the timing for the emissions testing required by the permit is appropriate, as the permit does not address ongoing, periodic monitoring. As charging, pushing, and quenching of coke are addressed by NESHAP standards adopted by USEPA, this permit appropriately relies on the compliance procedures of the NESHAP for ongoing verification of compliance by those operations. For the main stack, which complies with applicable emission limits using a combination of add-on control devices, appropriate monitoring is required on an ongoing basis to verify proper operation of each device. In particular, the proper operation of the baghouse for control of filterable particulate is addressed by the required bag leak detection system and the continuous emissions monitoring for particulate matter, as requested by Gateway. The proper operation of the spray dryer absorber is addressed by continuous emissions monitoring for SO_2. The proper operation of the activated carbon injection system is addressed by requirements for operational monitoring, which are included in the issued permit. Overall, the proper operation of control system for emissions of mercury is addressed by the continuous monitoring that is required for mercury emissions. For the waste heat stacks, proper operation is addressed by operational monitoring identifying any venting that occurs through these stacks, to readily enable compliance with the operational limits that have been set for the duration of venting to be verified.

166. The draft permit would not include any indicator monitoring to work in conjunction with emissions testing.[134] Thus, the permit should require the use of surrogates to determine continuous compliance with the proposed limits on VOM (CO), lead (coal lead content and filterable PM measured by CEMs), and sulfuric acid mist, if a study demonstrates an acceptable correlation between the parameter and the surrogate. The relationship developed in the study should be validated annually by simultaneous emissions testing and coal sampling, allowing for the

[134] The monitoring of indicator operating parameters when a pollutant cannot be continuously monitored is consistent with established USEPA practice as articulated in USEPA's draft NSR Manual. "[w]here continuous, quantitative measurements are infeasible, surrogate parameters must be expressed in the permit." However, this is a valid approach for "[o]nly those parameters that exhibit a correlation with source emissions…." Draft NSR Manual, p. H.6.

residence time through the plant. The permit should also provide that exceedance of the indicator range is per se a violation of the emission limit.

As discussed above, the permit includes appropriate indicator monitoring. Additional indicator monitoring can be required by the CAAPP permit if it determined to be appropriate. Moreover, except as such provisions are already contained in applicable NESHAP regulations, it would be premature to establish specific ranges for indicator parameters, directly tied to compliance status. As such provisions should be established, they are more appropriately established under USEPA rules for Compliance Assurance Monitoring, 40 CFR Part 64, when the initial application for the CAAPP permit for the proposed plant is processed.

167. The permit should specify a minimum operating temperature for the afterburner tunnel systems, which combust the gases exiting the coke ovens and control emissions of CO and VOM.[135] This is because the permitted VOM and CO emissions of the proposed coke plant would be very close to the PSD and NA NSR significance thresholds. The temperature in the afterburner tunnel system is critical to control of CO and VOM emissions. Emissions testing should be used to determine the minimum temperatures in the afterburner tunnel systems that are needed to ensure that CO and VOM emissions are below the significance thresholds. Operation at or above these minimum temperatures should be required.

Given the temperatures and residence times in the afterburner tunnels, it is not appropriate to use gas stream or combustion temperature in the afterburner tunnel systems as an indicator parameter for compliance. The afterburner tunnels systems are appropriately addressed like other fuel combustion devices, for which normal operation of a unit is relied upon to provide adequate destruction for CO and VOM. These afterburner tunnels should not be approached like "afterburner-type" control devices, in which auxiliary fuel is used to heat a cool exhaust stream to a temperature at which organic compounds in the exhaust stream are effectively destroyed. Moreover, because the tunnel systems are not control devices, the operating parameters in the tunnel systems, which are determined by the fundamental design of the heat recovery coking process, could not be manipulated in practice to determine the minimum values of those operating parameters at which compliance is still maintained.

Notwithstanding the above discussion, the issued permit does require operational monitoring for the gas stream temperature in the afterburner tunnels. However, the intended purpose of this monitoring is not to directly verify proper operation for destruction of VOM and CO. This operational monitoring, which Gateway would perform in any case as normal operation of the plant, is made "required monitoring" as these temperatures would provide a ready method to verify normal operation of the coking process itself.

168. The permit for the proposed plant should set requirements for the CO and VOM control efficiencies of the afterburner tunnels. The application asserts that the conditions in the afterburner tunnels will result in 98 to 99 percent destruction for VOM and CO. However, there is no proof as to these conditions and the resulting control efficiencies, nor would the permit require that this is achieved in practice. The application should

[135] As described in the application, these tunnel systems "fully combust the gases prior to release to atmosphere." Gases remain in the flues and common tunnel about 7 seconds where they are exposed to oxidizing conditions and temperatures from 1,600 to 2,500 °F.

be supplemented with test data from other similar sources, vendor guarantees, and design information sufficient to confirm that CO and VOM emissions would be no higher than claimed in the application.

As already explained, CO and VOM emissions are appropriately addressed with limits on emissions without also setting specific operational requirements for the afterburner tunnels. Moreover, it is not possible to set limits for VOM or CO control efficiency. Measurement of "pre-control" emission rates, as necessary to determine control efficiency, is not practical at a location before the afterburner tunnels. Unlike a coating or printing line in which a VOM-laden air stream is ducted to a separate afterburner control device to be burned, heat recovery coking is an integrated process. Combustion occurs both in the ovens themselves and in the associated afterburners tunnels. There is not a location in the process of coking before any combustion has occurred at which "uncontrolled" VOM and CO emissions could be measured in a way that could be reasonably used to calculate control efficiency. Accordingly, the statement about destruction efficiency in the application that is addressed by this comment must be construed in figurative sense. It was an attempt to convey the effectiveness of the combustion that occurs in the coking process in terms that are more familiar to individuals who are dealing with afterburner devices.

Finally, the emission data in the application that is the basis for the fundamental emission limits in the permit, which are expressed in lbs/hr, were conservatively developed from actual experience and emissions measurements at other heat recovery coke plants. These limits effectively constrain VOM and CO emissions of the coking process. It is not necessary that they be supplemented with limits on control efficiency for which measurements to verify compliance can not be performed.

169. The draft permit for the coke plant would not require that the emission reductions at US Steel that are being relied upon to net out of NA NSR and PSD will actually occur before the coke plant is constructed. The permit also would not contain provisions to ensure that offsets are implemented and maintained in the event that US Steel does not implement the road sweeping program.

The issued permits explicitly requires that emission offsets must be in place before initial startup or commencement of operation of the proposed plant, as required by the NA NSR rules. The permits also includes provisions to facilitate implementation of the road cleaning program, which is being relied upon for most of the offsets, by Gateway in the event that US Steel fails to implement the program. It should be noted that these provisions would not shield US Steel from enforcement for failure to implement this program, as this would be contrary to requirements in its permit for the coke conveyance system. However, these provisions would enable Gateway to implement the road cleaning program to also avoid enforcement for similar violations, while Gateway takes appropriate actions to force US Steel to fulfill its contractual obligations.

170. The project summary for the proposed coke plant states that the individual waste heat stacks used during maintenance and emergency shutdowns will vent less than 4 percent of the gases from the coking process. This "bypass venting" is excessive emissions because control equipment would also be bypassed. BACT and LAER limits must be met on a "continual basis at all levels of operation."

The issued permit for the coke plant appropriately establishes BACT and LAER. The permit appropriately addresses venting through the waste heat stacks as an

alternative mode of operation of the coking process and establishes a variety of requirements for this mode of operation, including numerical emission limits. These requirements are the result of a BACT and LAER analysis that specifically addressed this mode of operation, with extensive investigation to confirm that lower rates of emissions should not be set for particulate under the BACT and LAER provisions of the PSD and NA NSR rules.

171. Bypass venting is allowed at a limited rate at other heat-recovery coke plants.

The provisions that allow bypass venting at other heat-recovery coke plants confirms, at a fundamental level, that these facilities cannot be temporarily shutdown, interrupting the generation of any emissions, while necessary inspection and maintenance on ancillary heat recovery steam generators and control devices is being performed. They also provide relevant background for the amount of bypass venting that should be allowed for the proposed plant.

172. Does Illinois EPA have any technical data showing how Gateway will manage operation and maintenance of heat recovery steam generators to comply with the annual limit of 192 hours (8-days) for bypass venting?

This limit is based on experience at other heat recovery coke plants, which indicates that the annual maintenance of a heat recovery steam generator can be consistently completed within 8 days. It also reflects the Illinois EPA's experience that even gas-fired combustion units must be taken out of service on an annual basis for inspection and preventative maintenance. A key factor in the permitted duration of bypass venting is the need to cool a heat recovery steam before workers can enter a unit to even begin inspection and maintenance activities. Likewise, to avoid damage to a unit, including any refractory repairs that are made, a unit must be gradually brought back into service after work is completed. Accordingly, this limit requires the actual work on a heat recovery steam generator during each annual maintenance outage to be completed in about six days.

To comply with this limit, Gateway will have to carefully plan and efficiently conduct thorough inspections and maintenance on the heat recovery steam generators. Because of the need to have time for unforeseen delays or other problems that may be encountered during the course of a maintenance outage, the duration of maintenance outages should normally be significantly less than allowed, as such problems should not be routinely encountered.

173. The 192-hour limit was considered to be the "upper bound on the amount of outage that would typically be needed for the type of systems that they are using." An upper bound is not a meaningful limit.

This limit is by its very nature a bound, like the other limits in the permit, which sets bounds on the maximum amount of a pollutant that may be emitted or the minimum level of control that must be achieved. Setting limits that are not bounds, without any margin to account for normal variability in operation and circumstances, as suggested by this comment is not appropriate. In this case, limiting the extent of bypass venting with an "upper bound" is both meaningful and appropriate. Indeed, as another comment notes, malfunctions may occur resulting in additional venting. If the plant were limited to venting based on ideal circumstances, the permit would set limits that would be impossible for Gateway to comply, as any deviation from ideal conditions would lead to a violation of the limit.

174. Has the Illinois EPA considered requiring the use of soot blowers, which would keep the heat recovery steam generators in service longer between maintenance and reduce the amount of bypass venting?

The heat recovery steam generators would be equipped with soot blowers, as soot blowers are a normal feature on boilers that are heated with gases from combustion of solid fuel. The use of such devices is reflected in the issued permit, which requires that the heat recovery steam generators be equipped and operated with soot blowers.

The use of soot blowers does not affect the frequency of needed periodic maintenance, as discussed elsewhere in this Responsiveness Summary. This is because the primary purpose of such maintenance is to address the physical integrity of water and steam tubes, refractory, and other components of the units. Cleaning of tubes is incidental to this activity.

175. Has the Illinois EPA considered staggered charging, which would increase the time between charging adjacent ovens thereby reducing the bypass venting time? This practice was implemented at the heat recovery coke plant at Indiana Harbor to reduce bypass venting because the plant had trouble with malfunctions leading to exceedances of the allowed duration of venting.[136]

The proposed coke plant must be designed so that bypass venting does not occur during routine operation, as happens at the Indiana Harbor plant. This routine bypass venting is different than the scheduled bypass venting that must occur during periodic inspection and maintenance of equipment. As explained by Gateway, this routine bypass venting occurs at the Indiana Harbor plant because the ductwork and induced draft system can not always maintain negative pressure in certain ovens during conditions of peak gas generation. When this happens, the nearby vent stack has to be opened to ensure negative pressure is maintained in all ovens, venting some gas, while the remainder of the gas continues through heat recovery steam generators and the spray dryer/fabric filter system. This problem is due to design of the ductwork and induced draft system, which were not properly sized to handle peak gas generation. One of the measures that has been implemented to address this problem is "enhanced" staggered charging to reduce the level of peak gas generation. Enhanced staggered charging further spreads out the timing of the charging of individual ovens, which acted to stabilize the rate of gas generation.

The design of the proposed plant will reflect experience gathered at Indiana Harbor, which began operation in 1998, as well as Haverhill, which began operation in 2005 and has not experienced this problem. Accordingly, the plant should not have the design flaw that required corrections at Indiana Harbor. To ensure that this is the case, the issued permit requires that the ductwork and induced draft system be designed so that negative pressure can routinely be maintained, including conditions of peak gas generation, without the need for bypass venting. Accordingly, the only routine venting expected from the waste heat stacks would be the few minutes each month when each damper system must be tested to confirm proper operations.

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[136] According to a Venting Report prepared by the Indiana Harbor Coke Company, "… operating experience has shown that some venting of the flue gases prior to the heat recovery steam generators but downstream of the afterburner tunnel system is necessary to maintain the negative draft that is required for the operation of the coke plant." However, as Indiana Harbor also noted, tools are available to limit venting, and thereby excess emissions.

176. The “staggered charging method,” as implemented at the Haverhill plant, can limit venting during peak conditions. It flattens out the peak gas flow from groups of ovens by increasing time between charging adjacent ovens.

The “staggered charging method” at the Haverhill plant is the normal sequence of charging ovens and does not reflect the “enhanced” staggered charging that was initially required at the Indiana Harbor plant. The Haverhill plant has not experienced the problem with routine bypass venting due to overpressure that is experienced at Indiana Harbor. Accordingly, routine bypass venting to maintain negative pressure in the coke ovens should not occur at the proposed plant and is not allowed by the permit for the proposed plant.

177. “Air management” minimizes air leakage and excess air into the ovens by improving seals around dampers and access to the ovens. oxygen analyzers should be required at each heat recovery steam generator to monitor excess air.

Operational monitoring for oxygen, as suggested by this comment, would not achieve the objective identified in this comment. This is because air is introduced into the afterburner tunnels to complete combustion of the gases that are exhausting from the flues of the coke ovens. Accordingly, monitoring in the tunnels would not directly address the rate of air flow into the ovens themselves. In addition, because the rate at which air enters the ovens is an operational concern for Gateway, it is only necessary to make the operational monitoring that Gateway will be conducting into “required” monitoring if problems are actually experienced with air leakage that affect emissions.

178. Maintenance of heat recovery steam generators should be scheduled so that only one unit is out of service at a time.

This practice is required.

179. Inspection and maintenance of heat recovery steam generators should be conducted as efficiently and quickly as possible and the extent of allowed bypass venting should be limited in the context of BACT and LAER.

As already discussed, inspection and maintenance of equipment with accompanying bypass venting have been addressed in the context of BACT and LAER and bypass venting is subject to the requirements recommended in this comment. Various operating limitations are set to restrict the duration and rate of emissions during bypass venting. In addition, inspection and maintenance activity must be completed as quickly as reasonably practical as operation during these periods must be addressed be addressed by the Startup Shutdown Malfunction Plan for the plant, which is required by the NESHAP. (Refer to Condition 4.1.5(a)(i)(D) of the issued permit for the coke plant.)

180. Additional bypass venting due to malfunctions could easily cause the venting through the waste heat stacks to exceed expected amounts. To prevent this, the permit should include requirements further limiting the duration of venting.

It is unclear what provisions this comment is seeking. The provisions of the permit for the coke plant do not include any allowance for additional bypass venting due to malfunctions. They only allow bypass venting that occurs in conjunction with inspection and maintenance activity.

181. Is sweeping of public road required by any other permits currently in place for US Steel and, if so, what permits?

Cleaning of a few segments of public roadways is required by Construction Permit 95010001, which was issued in the mid-90s for a production increase at the Granite City Works. Weekly sweeping of Madison Avenue for 1/8 mile on either side of US Steel's 16th Street Gate is required. Weekly sweeping is also required for a small section of 20th Street extending approximately 1/4 mile in either direction from US Steel's Nash Street Gate. Monthly sweeping is required for the entire length of 20th Street between Madison Avenue and Edwardsville Road. This road sweeping required by that permit is ongoing and is reflected in the existing, baseline conditions for the determination of emission offsets.

182. Do the provisions for control of fugitive road dust in the permit for the coke conveyance system address the existing road cleaning program or do they require additional sweeping?

The program for control of fugitive dust in the permit for the coke conveyance would expand and enhance US Steel's current program for cleaning public roads in the vicinity of the Granite City Works, to generate additional reductions in emissions. The program would expand the current program as it would include additional road segments that are not part of the current program. In addition, the program would enhance the current program as the frequency for cleaning road segments that are already covered would be increased.

183. Why are the detailed provisions for the road sweeping program in the permit for the coke conveyance system instead of in the permit for the proposed coke plant?

The detailed provisions for the road cleaning program for emission offsets are in the permit for the coke conveyance system because US Steel is required to implement this program. However, general requirements related to emissions offsets are present in the permit issued to Gateway, as well as in the permit issued to US Steel.

184. Why wasn't Gateway required to better describe the fugitive dust control plan for the proposed plant in its application? The draft permit for the coke plant is not specific about what roads must be addressed.

Gateway was not required to more fully describe its fugitive dust control plan because this plan has a regulatory basis, i.e., significant requirements for this plan are set in 35 IAC Part 212, Subpart K. In this regard, the plan must address all "on-site" roadway and open areas at the proposed plant. In addition, these rules set a limit on the opacity of emissions from vehicle traffic on plant roads, i.e., no more than 5 percent opacity. Accordingly, the ability exists to directly address and enforce a level of control of fugitive dust separate and independent from implementation of specific measures to control fugitive dust. The permit for the coke plant need not set specific measures that must be implemented to comply with this opacity standard.

185. How are the roadways that will be covered by the road cleaning program for offsets in the coke conveyance permit distinguished from the roads that will be addressed by the fugitive dust control plan?

The roadways are readily distinguished. The roads from which offsets will be

obtained are public roads, not on plant property. The roadways at the proposed coke plant, and other open areas at the plant that are sources of fugitive dust, are addressed by the fugitive dust control plan.

186. How would the effectiveness of the road cleaning program for off-site roads required to actually achieve the emission offsets be verified?

On a routine basis, the effectiveness of the program would be verified by tracking the implementation of the road cleaning activities specified by the permit for the coke conveyance system. These measures have been determined to be able to obtain the needed reduction in emissions to provide emission offsets, based on the USEPA methodology for quantifying road dust emissions and relevant area-specific data and measurements. On a periodic basis, US Steel must reevaluate the effectiveness of its road cleaning program to provide the need reductions in emissions, by performing additional measurements and preparing a new analysis of the reduction in emissions that is being obtained. This will enable revisions to the program if needed to address changes in circumstances and ensure that the required reductions in emissions are being obtained. This reevaluation is required to be performed every three years, consistent with requirements on Illinois to maintain "reasonable further progress" in reducing particulate emissions in the area, which is also evaluated on a three-year schedule. In addition, US Steel must reevaluate the effectiveness of the program upon formal request by the Illinois EPA, which would enable a reevaluation to be triggered to address any developments in the areas that could significantly affect the effectiveness of this program.

187. For purposes of determining the amount of available offsets, does the road sweeping program take into consideration PM_{10} reductions or only $PM_{2.5}$ reductions?

As the permitted emissions of the proposed coke plant have been set in terms of PM_{10} for purposes of NA NSR, the emission reductions and available offsets from the road cleaning program must also be determined in terms of PM_{10}.

188. In a March 2007 e-mail to Gateway, the Illinois EPA indicated that only a portion of the sweeping offset program would be accepted. However, the draft permit indicates that road sweeping will total 236 tons per year of PM_{10}. How was that number reached, as compared to the earlier number?

The amount of the emission reduction that the Illinois EPA was prepared to accept increased after US Steel expanded the planned program and provided more information to support the amount of the reduction. A key action was the performance of area-specific measurements, a "road cleaning study" in August 2007. This study involved area-specific measurements of the silt loading on various road segments before any additional cleaning and after additional cleaning on the frequency planned for the road cleaning program.

189. In another e-mail, Illinois EPA discussed wanting to make sure that the road sweeping program was "top notch." What is the Illinois EPA's definition of top notch?

It is believed that this e-mail was discussing the type of equipment that would be used for cleaning roads. The Illinois EPA's general concern is that the cleaning program must be effective in removing silt from roadways without creating emissions in the process. For this purpose, there are several elements that need to be met for cleaning equipment to qualify as "top notch." The cleaning unit must not generate emissions by dislodging dust that then

escapes directly to the atmosphere. The unit must also pass any exhaust stream through a filter before it is exhausted, so that collected dust is not vented with the exhaust from the stream. Finally, the unit must be capable of picking up fine material from the road surface. The issued permit addresses these elements by example, by reference to EnviroWhirl Sweepers, rather than by attempting to set written criteria for acceptable vacuum cleaning units.

190. Has Illinois EPA done any studies or seen any studies as to how effective vacuum sweepers are?

The Illinois EPA has seen a number of studies that show that road cleaning programs can reduce emissions of fugitive dust from roadways, including some of the studies that were submitted with comments on the proposed plant. These studies show that the effectiveness of road cleaning depends on the type of cleaning equipment that is used and the frequency with which cleaning is performed. However, consistent with USEPA guidance in AP-42, the Illinois EPA would agree that the effectiveness of a road cleaning program that is seeking to achieve and maintain major reductions in emissions, like the program that would be implemented by US Steel, should be evaluated from "before and after" area-specific measurements of silt loadings.

191. The ambient air quality monitors in Granite City measure the highest levels of $PM_{2.5}$ in the state and some of the highest in the Midwest. This is because of the Granite City Works. On a list prepared by the American Lung Association, which is on its web site, Granite City is the tenth most polluted in particle pollution.

The ambient monitoring stations operated by the Illinois EPA in downtown Granite City near the Granite City Works do measure the highest levels of $PM_{2.5}$ in the state. These monitors are specifically sited to address the impact of the Granite City Works on particulate matter air quality. Illinois and USEPA are legally required by the federal Clean Air Act to ensure that air quality for $PM_{2.5}$ improves so that the air quality measured at these monitors complies with the NAAQS for $PM_{2.5}$.

192. US Steel's Granite City Works is responsible for the entire St. Louis region not meeting the NAAQS for $PM_{2.5}$.

This is not correct. While the Granite City Works may have a critical role on $PM_{2.5}$ air quality in Granite City, $PM_{2.5}$ air quality across the Greater Metropolitan St. Louis area is the combined result of the emissions of many sources, which share responsibility for the area violating air quality standards and being nonattainment. This is also the situation for air quality in Granite City, which is affected by the regional levels of air quality that exist in the St. Louis area. In this regard, there have been significant improvements in recent years in the $PM_{2.5}$ air quality measured on an annual basis in Granite City due to improvements in the regional air quality in the St. Louis area.

193. In Madison County about nine percent of the children have asthma. The more particulate in the air, the more likely that children will get asthma. There are many people who suffer from other chronic respiratory diseases, like emphysema, and with heart disease.

The presence in the area of children and adults with respiratory diseases, including asthma, and other diseases affected by poor air quality is an important issue. However, it is not a basis to refuse to grant a permit for

the proposed coke plant project, as the application for the project shows that it will comply with applicable regulatory requirements. The poor air quality that poses a threat to individuals that are at particular risk is the cumulative result of emissions from the variety of existing sources that contribute to air pollution in urban areas, including manufacturing facilities, power plants, trucks, buses, cars, and the activities of individual households. On a long-term basis, emissions have been reduced and regulatory programs are ongoing to further reduce the emissions from these sources. This is appropriate and necessary because continuing improvements in urban air quality require that existing sources be better controlled or replaced with new, lower emitting sources.

At the same time, efforts also continue to be made to improve public awareness of daily air quality levels. This is particularly important for individuals with asthma or other chronic respiratory diseases because, in addition to other medical care and treatment, it allows such people to take appropriate measures to reduce any added risk to their health posed by poor air quality, by reducing time spent outdoors, avoiding physical exertion, and taking any extra medications that are prescribed during such conditions. To assist asthmatic individuals and others who are particularly sensitive to ambient air quality, the Illinois EPA uses the Air Quality Index to report air pollution levels on a daily basis. This enables people who may be affected by poor air quality to appropriately plan and adjust their activities.

194. At a recent at public hearing concerning attainment designations for $PM_{2.5}$, which was held by the Illinois EPA's Air Quality Planning Section, I was told that control of fugitive road dust was not being considered as a control strategy to help bring Madison County into attainment but was being planned for emissions offsets in the permitting of the proposed coke plant in Granite City. I don't think that road cleaning is being used as a control strategy elsewhere, which is one of my problems with use of road cleaning to supply offsets.

As stated in this comment, at this time, the Illinois EPA is not looking at road cleaning and control of fugitive dust as one of the approaches to comply with the $PM_{2.5}$ NAAQS. However, given the circumstances in Granite City with US Steel, and the obvious local impacts of the steel mill, road cleaning is still an acceptable approach to obtain emission offsets for the proposed coke plant.

195. US Steel has proposed using street sweeping to offset the particulate emissions from the proposed coke plant. Honest emission offsets should be required that provide a real reduction in emissions of $PM_{2.5}$.

The offset transaction for the proposed coke plant is being properly conducted. Emission offsets in terms of PM_{10} are being required for the permitted emissions of the proposed plant, also in terms of PM_{10}. While most of the emission offsets would come from a road cleaning program, some of the emission offsets would come from a reduction in emissions at the Granite City Works that will result from the installation of a desulfurization system on the existing byproduct coke plant. The road cleaning program for emissions offsets will provide real reductions in emissions in the Granite City area. While the character of the emission offsets are not a perfect match for the emissions of the proposed plant, it is not realistic to expect such a match to occur.

196. For the proposed project, emissions of fugitive dust from storage piles and associated material handling operations were calculated using methodology from USEPA's *Compilation of Air Pollutant Emission Factors*,

AP-42. While this methodology provides equations that can be used to calculate emissions, a number of variables need to go into the equations, such as wind speed and moisture content of material. How were these variables selected and where are they recorded?

Variables were selected from information also contained in AP-42 or by US Steel and Gateway based on their knowledge of the material that would be handled. The selected variables are contained in the emission calculations that were included in the applications. For example, the average annual wind speed for the St. Louis area, 10 miles per hour, was used. While the actual moisture content of coke is expected to be 7%, the moisture content was assumed to be 4.8 percent, which is the highest value for moisture content that can be used with the equation. (The possible range of moisture content is 0.25 to 4.8%.

197. There is a project underway to analyze the particulate collected by the $PM_{2.5}$ ambient monitors in East St. Louis, to determine the percentages of the different species of the particulate in the sample and the role of different types of sources in contributing to nonattainment. Why can't the Illinois EPA wait for the results of this speciation analysis, so that it knows where emissions must be further controlled to achieve attainment. The future is uncertain when an area is nonattainment. I know that US Steel and the workers at the Granite City Works would like Granite City to be in attainment.

Work to develop the plan to bring Greater St. Louis and Granite City into attainment for $PM_{2.5}$ and the permitting of proposed construction projects can and should proceed on separate schedules. Even though this area is nonattainment, the Clean Air Act allows construction projects to go forward and does not put a hold on any construction activity. The Clean Air Act does establish stringent requirements for major construction activity, but this project meets those requirements. Accordingly, the issuance of permits should not be delayed to await the results of this speciation study

This is particularly true as the speciation study will not directly identify the further emission reductions that should be made to bring the area into attainment. It will only provide further insights into the nature of current air quality. Substantial work will be required to complete the attainment plan, especially as related to air quality in Granite City. This work must go on whether or not there is a new coke plant, to identify and require appropriate further reductions in emissions locally, to go with the regional reductions are already required , to take the area all the way to attainment

198. How did the Illinois EPA make the decision to let the coke plant proposed by Gateway net out of NSR with emissions decreases from US Steel’s cogeneration boiler project?

From a regulatory standpoint, the proposed coke plant is entitled to net out of NSR because the proposed plant and US Steel’s Granite City Works are considered a single source for purpose of the NSR regulations. The three criteria that are considered in a single source determination are the common location, common industrial grouping, and common control. All three criteria must be met for the two facilities to be considered a single source. Clearly the proposed coke plant is located on land that is currently owned by US Steel. While the land will be sold to Gateway by US Steel, under the terms of a contract, this satisfies the requirement for common location. While the two facilities have different Standard Industrial Classification codes, the two facilities have an obvious support facility relationship. In particular, the purpose of the

proposed Gateway coke plant is to provide coke to US Steel for use at the Granite City Steel. Finally, as previously discussed, there will be a contractual relationship between US Steel and Gateway addressing the coke oven plant. In this regard, the contract provides decision-making authority to US Steel and a service relationship exists between the Gateway and US Steel. The Illinois EPA has dealt with a number of projects at other types of facilities (e.g., a hydrogen plant next to a petroleum refinery and sources handling scrap metal or slag products next to a steel mill). The consistent conclusion when the circumstance of such facilities are scrutinized is that they are single sources with the larger host facility.

The cogeneration boiler itself will not provide any emissions decreases for the proposed coke plant. Other actions at the Granite City Works are used in the netting for the proposed plant, such as the shutdown of Boilers 1 through 10, installation of low NO_x burners on certain equipment, and installation of a desulfurization system for the coke oven gas produced by the existing by-product recovery coke plant.

199. Why did the Illinois EPA hold a separate public hearing for the proposed coke oven plant proposed by Gateway, instead of combining it with the public hearing for the cogeneration boiler project proposed by US Steel?

The Illinois EPA held two public hearings because it was believed that it would help distinguish and differentiate between the two projects. In particular, the nature of the projects is different as the cogeneration boiler project would replace existing boilers, whereas the coke plant project would increase the source's capacity for production of coke. There are also significant differences in the regulatory requirements that apply to the projects, with the cogeneration boiler project not being a major project under NA NSR and PSD and the coke oven plant project being major for emissions of particulate matter.

200. Was any special effort made by the Illinois EPA to reach out to the community?

The Bureau of Air reached out to groups in the area that it was aware of that have expressed interest in air quality issues and permitting, including minority groups and groups from previous hearing that the Bureau has held in the Metro-East area during recent years.

201. Why are there separate applications and draft permits for the coke conveyance system and the coke plant?

The applications and permits are separate because they involve different companies. Gateway is the applicant and permittee for the proposed coke plant. US Steel is the applicant and permittee for the associated conveyance system.

202. What is the Illinois EPA doing or going to do to protect the property owners in the immediate area? There has been some talk of US Steel putting a buffer zone in for the proposed coke plant. Will a buffer zone be required?

The Illinois EPA's understanding is that US Steel is moving forward with plans to put in berms and other landscaping features to provide both physical and visual separation between the proposed coke plant and the nearest residences. However, this activity is outside the scope of the permits for the proposed project, which addresses control of emissions and protection of air quality.

203. The coke plant is adjacent to Horseshoe Lake. While Horseshoe Lake is a popular state park, there are people who use this lake for subsistence fishing, consuming the fish they catch as an important part of their diet. As such, this is an environmental justice issue and greater than 90 percent control efficiency should be required for mercury.

As control technology is now available for emissions of mercury, the proposed plant should be developed with that technology and it should be operated to fully take advantage of its capabilities. However, the use of that technology by the proposed plant will not act to improve the quality of fish that are caught at Horseshoe Lake. People that fish at Horseshoe Lake need to be aware that there are currently two advisories from the Illinois Department of Public Health for consumption of fish from Horseshoe Lake, one related to pesticide and the other to mercury.

GENERAL COMMENTS

x. I hope that air quality will be better with the proposed coke plant because Granite City is in a nonattainment area.

x. I believe that the poor quality in Granite City has negatively affected the value of my home compared to property values in other communities located east of Granite City.

x. The project will provide a significant economic boost to our region.

x. I strongly support the proposed coke plant project. It will provide a significant economic boost to our region.

x. The proposed coke plant project will translate into approximately 1,100 good-paying skilled construction jobs at peak development using local building and construction trade workers. It will also mean approximately 70 new full-time manufacturing jobs.

x. The proposed coke plant would improve the market competitiveness of Granite City Works and employment stability for the current employees.

x. The proposed coke plant will be environmentally responsible and use the latest technology subject to strict federal and state requirements for control of emissions.

x. The proposed coke plant will have a major positive economic impact for Madison County by not only providing a large number of high paying construction and permanent jobs, but also by solidifying the position of the Granite City Works within US Steel’s world-wide network of facilities. To be able to produce these economic benefits while protecting the environment by reducing emissions is a win-win situation for our area.

x. I am very glad there will be a new coke plant but it is time for US Steel to retire its existing, old coke plant.

x. This proposed coke plant project will provide job stability for the over 2,000 people currently working at the Granite City Works, and indirectly create and support thousands of jobs in the area. And, this will occur

in an environmentally protective and responsible way, given the design of the plant and the systems used to control emissions.

x. The ability of the US Steel to develop this proposed coke plant is vital to the City of Granite because US Steel is essential to the economy of Granite City.

FOR ADDITIONAL INFORMATION

Questions about the public comment period and permit decision should be directed to

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Listing of Significant Changes between the Draft Permit And the Issued Permit for the: Proposed Heat Recovery Coke Plant

Finding 2.1(c): A separate finding is made, replacing a portion of Draft Finding 2.1(b), further discussing the roles of US Steel in the development and operation of the proposed plant.

Condition 3.1.3: This condition, which addresses requirements for emissions offsets for particulate matter, has been enhanced to better identify the Road Cleaning Program for offsets that is to be implemented by US Steel, and which, in the alternative, must be implemented by Gateway Energy.

Conditions 4.1.1 and 4.1.2: These conditions, which describe the emission units in the coking process and their operation, have been revised for clarity and for consistency in terminology.

Condition 4.1.5(a)(i)(D): This condition, which provides the determination of BACT/LAER Technology related to the coking process, is revised to enhance and clarify requirements related to venting through the waste heat stacks. The determination is enhanced as the extent of this venting, which is associated with inspection and maintenance of equipment, must on an ongoing basis generally be minimized using good practices. For this purpose, periods of venting are required to be addressed by the Startup, Shutdown and Malfunction Plan required for the plant by 40 CFR 63.6(e). Consistent with this requirement, the operating rate of coke ovens that contribute to emissions during venting must be reduced during maintenance of individual heat recovery steam generators, as well during maintenance of control equipment. The determination also recognizes that venting occurs during inspection of the damper systems, which would be performed on a monthly basis and only last a few minutes. Finally, an overall limitation is set for the duration of venting, based on a running total of 12-months of data, and limitations on venting of individual stacks for inspection and maintenance of equipment are applied on a calendar-year basis.

Condition 4.1.5(a)(i)(E): This new condition, which is part of the determination of BACT/LAER Technology for the main stack from the coking process, requires use of a filter material or fabric in the baghouse that provides enhanced control of fine particulate, as compared to conventional filter fabric. Requirements are set for the type of fabric and the performance of the fabric as measured by a laboratory using a standard analysis methodology.

Condition 4.1.5(a)(ii)(C): Lower emission limits are set by this condition, which provides the determination of BACT/LAER Emission Limits for particulate emissions from the main stack from the coking process. In particular, limits are set at 0.005 and 0.011 gr/scf for filterable and total particulate, respectively, compared to 0.008 and 0.014 gr/scf proposed in the draft permit. The lower limits are based on improved performance due to the use an enhanced filter fabric.

Condition 4.1.5(b): Provisions for control of mercury emissions are revised to improve clarity.

Conditions 4.1.6(b)(i), (ii) and (iii): Lower limits are set for monthly permitted emissions of charging, pushing and the main stack from the coking process. The lower monthly limits are the product of the hourly limits and operation for 31 days (744 hours), rather than 10 percent of the annual limits.

Condition 4.1.6(b)(iii)(A): Lower limits are set for the permitted emissions of particulate from the main stack of the coking process. These lower limits are consistent with the lower emission limits set as BACT/LAER for this emission unit.

Condition 4.1.6(b)(iii)(B): A provision is added to accommodate the possibility that limits could be set on the permitted emissions of the main stack of the coking process for particulate measured in terms of $PM_{2.5}$, which could be set based on the results of the testing for emissions of $PM_{2.5}$ required to be performed for the main stack pursuant to new Condition 4.1.7-2(a)(iii).

Conditions 4.1.6(b)(vi), 4.1.8(c)(i) and 4.1.8-1(c)(iii) and (iv): Condition 4.1.6(b)(vi), which addresses the setting of limits for the permitted emissions of mercury from the plant, replaces a similar provision elsewhere in the draft permit (Draft Condition 4.1.6(b)(iii)(B)). This condition enhances applicable requirements as it provides for limits to be set for mercury emissions from the waste heat stacks as well as the main stack. Condition 4.1.8-1(c)(i) (which also replaces Draft Condition 4.1.6(b)(iii)(B)) clarifies applicable requirements for emissions monitoring for mercury on the main stack of the coking process for the purpose of setting emission limits for mercury. The requirements are “clarified” as these provisions for monitoring emissions of mercury are transferred to Condition 4.1.8-1(c), which contains other requirements for emissions monitoring for the coking process. In addition, the condition more clearly indicates that this monitoring must be conducted using methodology adopted by USEPA at 40 CFR Part 75 for monitoring of mercury emissions from coal-fired power plants. Finally, Conditions 4.1.8-1(c)(iii) and (iv), (which also replace Draft Condition 4.1.6(b)(iii)(B)) enhance, refine and clarify applicable requirements for the setting of limits for mercury emissions. They develop requirements for the submittal of a detailed report for the assessment of the emissions of mercury from the main stack and waste heat stacks, which would include recommended limits, the collected data for mercury emissions, and relevant information on the design and operation of the control systems on the main stack as related to control of mercury emissions. New Condition 4.1.8-1(c)(iv) allows operation of the carbon injection system at reduced injection rates as reasonably needed to enable the effectiveness for control of mercury to be fully evaluated. Any such operation must occur in accordance with an evaluation plan that has been provided in advance to the Illinois EPA and the data and findings from such operation must be included in the required assessment report.

Conditions 4.1.7-1, 4.1.7-2 and 4.1.7-3: Conditions for testing are clarified as they are separated. That is, applicable testing required by the NESHAP regulations is addressed in Condition 4.1.7-1, testing to verify and determine emission rates is in Condition 4.1.7-2, and required sampling and analysis of coal is in Condition 4.1.7-3. In the draft permit, these requirements were contained in Conditions 4.1.7(a), (b) and (c).

Condition 4.1.7-2(a)(i)(A): Requirements for testing to verify emission rates from main stack of the coking process are enhanced and clarified. Testing is required for emissions of sulfuric acid mist. Testing for emissions SO_2 is not addressed as such testing will occur in conjunction with the initial certification of the required continuous emissions monitoring system for SO_2.

Condition 4.1.7-2(a)(ii): Requirements for testing to verify emission rates from the waste heat stack are refined, by requiring that such testing be completed by the conclusion of the fourth scheduled inspection and maintenance of a heat recovery steam generator. This will facilitate expeditious completion of initial inspection and maintenance activity, as well as efficient performance of emissions testing, as initial inspection and maintenance activity that is carried out would not be complicated by simultaneous performance of emission tests.

Conditions 4.1.7-2(a)(iii), (b)(ii) and (d)(i): New Condition 4.1.7-2(a)(iii) requires a series of at least three tests on the main stack of the coking process for emissions of particulate, including measurements of particulate in terms of $PM_{2.5}$. This action is being required to collect definitive data for emissions of $PM_{2.5}$. New Condition 4.1.7-2(b)(ii) addresses the test methods to be used for measuring emissions of $PM_{2.5}$, as USEPA has not yet adopted a Reference Test Method for measurements of $PM_{2.5}$, only having developed a Conditional Test Method. New Condition 4.1.7-2(d)(i) requires submittal of a detailed report after this series of tests is completed, which report would provide an assessment of the emission of $PM_{2.5}$ from the main stack together with relevant information on the design and operation of the control system as related to control of $PM_{2.5}$.

Condition 4.1.7-2(a)(iv): This new condition requires a second round of emissions testing for the main stack of the coking process to verify emission rates for NOx, CO, VOM, lead and (if requested by the Illinois EPA) sulfuric acid mist. This emissions testing would be required to be conducted approximately two years after the initial testing. Testing for the charging and/or pushing processes would also have to be conducted if requested by the Illinois EPA.

Condition 4.1.7-2(d)(ii): This new condition requires Gateway energy to apply for a revision of the permit to set limits for emission of particulate in terms of $PM_{2.5}$ if the series of emission test for $PM_{2.5}$ and other relevant information show that the setting of such limits is proper, feasible and appropriate. If this is the case, Gateway Energy must also submit a proposal for limits in terms of $PM_{2.5}$, which reflect the lowest rates of emissions that would be achievable on an ongoing basis, together with information supporting its recommended limits.

Conditions 4.1.8-1, 4.1.8-2 and 4.1.8-3: Conditions for monitoring are clarified as they are separated. That is, required continuous emissions monitoring is addressed in Condition 4.1.8-1, required continuous operational monitoring is in Condition 4.1.8-2, and instrumentation requirements are in Condition 4.1.8-3. (In the draft permit, all requirements were combined in Condition 4.1.8.) Requirements are also clarified as certain provisions for operational monitoring in the draft permit are not present in the issued permit, as those provisions in the draft permit were redundant and repeated monitoring and work practices required by regulation under the NESHAP.

Condition 4.1.8-1(a): This condition, which addresses monitoring for SO_2 emissions from the main stack, is clarified by including references to the relevant provisions of the NSPS that will apply to this monitoring.

Condition 4.1.8-1(b): This new condition requires continuous emissions monitoring for particulate to be conducted on the main stack of the coking process. This continuous emissions monitoring system must be operated in accordance with USEPA guidance for such systems, with reports for collected data and other relevant information for the operation of this system submitted to the Illinois EPA on a semi-annual basis. This monitoring system must be operated for at least three years. During this "trial period," this system would not be used to directly determine compliance with emission limit but would be used as a tool for compliance assurance monitoring. After the trial period, this monitoring system must be operated on an ongoing basis unless the Illinois EPA determines that the system does not provide accurate, reliable data. If a continuous emissions monitoring system for $PM_{2.5}$ becomes available and is approved by USEPA for similar units, a $PM_{2.5}$ continuous emission monitoring system must be installed within one year and be evaluated. If the Illinois EPA determines that the $PM_{2.5}$ monitoring system can replace the particulate monitoring system, continuous emission monitoring for $PM_{2.5}$ would be required on an ongoing basis, replacing continuous emission monitoring for particulate.

Condition 4.1.8-1(c)(ii): This new condition requires emissions monitoring for mercury emissions from the main stack of the coking process to be continued after data is collected to set limits for mercury emission. An alternative approach for monitoring emissions could only be taken if the Illinois EPA specifically determines that either periodic monitoring or continuous emissions monitoring (if sorbent trap monitoring is being conducted) is appropriate to verify compliance with the limits that have been set for mercury emissions.

Condition 4.1.8-2(b): This new condition requires operational monitoring of the baghouse for the main stack of the coking process with a Bag Leak Detection System. This system must be operated in accordance with requirements developed by the USEPA in 40 CFR 63 Subpart DDDDD for these systems when installed on solid-fuel fired boilers.

Condition 4.1.8-3(a), (b), (c) and (e): These new conditions require instrumentation to be operated for gas temperature on each afterburner tunnel system, the pressure drop on the baghouse on the main stack, and the setting or rate of injection of carbon by the activated carbon injection system. Condition 4.1.8-3(e) requires proper operation of all required instrumentation.

Condition 4.1.9(b): The recordkeeping required for emissions of the coking process are enhanced to more thoroughly specify the different types of records and information that must be kept.

Condition 4.1.10(a)(ii) and (f): These new conditions enhance reporting for deviations and routine venting through the waste heat stacks. Condition 4.1.10(a)(ii) requires a separate deviation report for any event when venting through a waste heat stack lasts for 60 minutes or more, other than for scheduled inspection and maintenance of equipment. Condition 4.1.10(f) requires submittal of periodic reports on at least a semi-annual basis that provide the duration, nature and other relevant information about venting through waste heat stacks during the reporting period.

Condition 4.2.5(b)(ii)(B): Lower emission limits are set by this condition, which provides the determination of BACT/LAER Emission Limits for particulate emissions from the handling of dry materials. Specifically, limits are set at 0.005 and 0.008 gr/scf for filterable and total particulate, respectively. The draft permit would have only set a limit of 0.010 gr/scf for filterable particulate. This corrects an error in the draft permit.

Condition 4.2.6(a)(iii): This new condition set limits for the permitted emissions of particulate from the crushing and screening of coke, consistent with emission data in Attachment 1 of the draft permit, which provided the summary of the permitted emissions of the proposed coke plant project. This corrects an omission in the draft permit.

Attachments 1 and 2: Changes made to Attachment 1, the Project Emission Summary, and Attachment 2, the Netting Analysis, for the proposed coke plant project to reflect the lower rates of permitted particulate emissions allowed for the main stack of the coking process by Condition 4.1.6(b)(iii)(A).

Listing of Significant Changes between the Draft Permit and the Issued Permit for the Proposed Coke Conveyance System

Condition 2.6: This condition finds that based on the permitted PM_{10} emissions of the project, 234.09 tons per year, no less than 235 tons of PM_{10} emission offsets are required. US Steel and Gateway have committed to provide 267.77 tons of emission offsets.

Condition 3.1.1: This condition, which addresses requirements for emissions offsets for particulate matter, has been clarified to better identify the Road Cleaning Program for offsets that is to be implemented by US Steel, and which, in the alternative, must be implemented by Gateway Energy.

Condition 3.6.1: This condition specifies that at least 236.03 tons per year of particulate, determined as PM_{10} shall be controlled under the road cleaning program beginning no later than commencement of operation of the proposed heat recovery coke plant or by May 2009, whichever is first. Such emission reductions shall be determined based on the baseline emission levels existing on the road segments prior to the proposed heat recovery coke plant. The segments included in the road cleaning program are further delineated to better identify the road segments contained within the program. Benton Street from Rock Road and Niedringhaus has been also included in the road cleaning program. For those roads addressed by Condition 30 of Construction Permit 9501001, credit shall only be taken by US Steel for reductions in emissions beyond those already required by the existing program.

Condition 3.6.2(b): Concerning the control requirements for the road cleaning program, the affected segments shall be cleaned using vacuum cleaning equipment. Prior to venting any collected air from cleaning equipment to the atmosphere, the air is required to be filtered.

Condition 3.6.2(c): Provisions concerning the frequency of cleaning have been revised to improve clarity. Benton Street from Rock Road and Niedringhaus is now required to be cleaned on a twice monthly basis.

Condition 3.6.3: Conditions for silt loading measurements are clarified. An additional requirement has been included in the permit for US Steel to measure silt loading being maintained on the roadways at least every three years.

Condition 3.6.4: This new condition requires US Steel to maintain records describing the road cleaning program, including, among other things, records containing calculations and analysis documenting the annual reduction in emissions that is achieved by the road cleaning program.

Condition 3.6.5: This new condition requires US Steel to submit an annual report providing certain minimum information to the Illinois EPA in conjunction with its Annual Emission Report describing the previous year’s implementation of the road cleaning program.

Conditions 4.1.1 and 4.1.2: These conditions, which describe the coke conveyance system, have been revised to clarify that the coke from Gateway could be handled through a new set of storage bins or could be handled in the same manner that purchased coke is now being handled. No increase in permitted emissions accompany this change.

Attachments 1 and 2: Changes made to Attachment 1, the Project Emission Summary, and Attachment 2, the Netting Analysis, for the proposed coke plant project to reflect the lower rates of permitted particulate emissions allowed for the main stack of the coking process by Condition 4.1.6(b)(iii)(A) of Construction Permit 06070022.