ENVIRONMENTAL LAW & POLICY CENTER
Protecting the Midwest's Environment and Natural Heritage

June 18, 2010

Lisa Jackson
U.S. EPA Administrator
Ariel Rios Building
1200 Pennsylvania Ave, N.W.
Washington, DC 20004

RE: Petition Requesting that the Administrator Object To the Issuance of the Proposed Title V Operating Permit for the Cash Creek Generation Station.

Dear Administrator Jackson,

Please find enclosed a copy of the Environmental Law & Policy Center's Petition regarding the Title V Operating Permit for the Cash Creek Generating Station in Henderson County, Kentucky. Also enclosed is a CD of exhibits. Please do not hesitate to contact us with any questions.

Sincerely,

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John Lyons, KDAQ
James Morse, KDAQ
W. Blaine Early, III, Stites & Harbison, PLLC
Michael McInnis, ERORA Group, LLC

BEFORE THE ADMINISTRATOR

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

In the Matter of the Proposed Operating Permit for:

CASH CREEK GENERATION, LLC to operate the proposed source located at Kentucky State Highway 1078, Henderson County, Kentucky	Permit No. V-09-006 Source I.D. No. 21-101-00134

Proposed by the Commonwealth of Kentucky,
Environmental and Public Protection Cabinet

PETITION REQUESTING THAT THE ADMINISTRATOR OBJECT TO THE ISSUANCE OF THE PROPOSED TITLE V OPERATING PERMIT FOR THE CASH CREEK GENERATION STATION

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On behalf of:

SIERRA CLUB

URSULINE SISTERS OF MOUNT SAINT JOSEPH

VALLEY WATCH

Date: June 18, 2010

Pursuant to Clean Air Act § 505(b)(2) and 40 CFR § 70.8(d), Valley Watch, the Ursuline Sisters of Saint Joseph, and Sierra Club ("Petitioners") hereby petition the Administrator of the United States Environmental Protection Agency ("U.S. EPA") to object to the proposed Title V Operating Permit, Permit No. 09-006, for the source located at Kentucky State Highway 1078, Henderson County ("Cash Creek Station") ("Permit"), issued by the Kentucky Division for Air Quality ("KDAQ" or "Agency") to Cash Creek Generation, L.L.C. ("Cash Creek" or "Applicant").[1] This 09-006 permit is a second and separate permit for the proposed new Cash Creek facility, previously permitted under No. 07-017. Petitioners provided comments to the Agency on the various draft and revised proposed permits leading up to the Permit. A true and accurate copy of each set of comments relevant to this Title V petition opportunity is attached.[2] This petition is filed within sixty days following the end of U.S. EPA's 45-day review period, as required by Clean Air Act § 505(b)(2).[3] The Administrator must grant or deny this petition within sixty days after it is filed.

If the Administrator determines that this permit does not comply with the requirements of the Clean Air Act ("CAA") or 40 C.F.R. Part 70, she must object to its issuance. *See* 40 C.F.R. § 70.8(c)(1). ("The Administrator will object to the issuance of any permit determined by the Administrator not to be in compliance with applicable requirements or requirements of this part.") The Permit continues to fail to comply with the applicable CAA requirements and/or the requirements of 40 C.F.R. Part 70 in a number of ways. First, the Permit was issued pursuant to a faulty public notice and public comment period during which significant required permit supporting materials were absent from the record. Second, the Permit is based on a significant underestimation of flaring emissions and fails to contain proper BACT limits for the flare. Third, the Applicant and KDAQ underestimated fugitive emissions from equipment leaks and failed to include proper BACT limits for equipment leaks. Together, the flare and equipment leak errors

[1] Exhibit 1, KDAQ, Final Revised Proposed Air Quality Permit, Permit No. V-09-006, March 5, 2010. Unless otherwise noted, references and citations to the "Permit" in the petition are to the Final Revised Proposed permit from March 5, 2010.

[2] Exhibit 2, Letter from James Gignac, McGillivray Westerberg & Bender, to James Morse, KDAQ, "Public Comments, Cash Creek Generating Station Draft Permit V-09-006, " October 8, 2009 (October 2009 Comments); Exhibit 3, Letter from Meleah Geertsma, Environmental Law and Policy Center, to James Morse, KDAQ, "Public Comments, Cash Creek Generating Station Draft Permit V-09-006, December 14, 2009 version," January 14, 2010 ("January 14th Comments") (69 pages plus exhibits); Exhibit 4, Letter from Meleah Geertsma, Environmental Law and Policy Center, to James Morse, KDAQ, "Public Comments, Cash Creek Generating Station Draft Permit V-09-006, December 14, 2009 version," January 15, 2010 ("January 15th Comments") (3 pages).

[3] *See* Exhibit 5, EPA Region 4: Proposed Title V Permits, Proposed Kentucky Permits ("EPA Region IV Title V webpage") (listing petition deadline of June 18, 2010).

led to the erroneous determinations that the facility is a minor source of VOCs and H_2S. Fourth, the errors in the flare and equipment leak analyses also resulted in improperly categorizing the proposed facility as a minor source of hazardous air pollutants. Fifth, the Applicant and KDAQ failed to ensure protection of the PM_{10} and $PM_{2.5}$ NAAQS by failing to model worst-case allowable emissions from material handling. Sixth and finally, the Applicant and KDAQ failed to ensure protection of the ozone NAAQS by conducting an inappropriate qualitative assessment of ozone impacts.

For all of these reasons, the Permit is not in compliance with the applicable requirements and the Administrator must object.

I. BACKGROUND.

KDAQ manages a combined program for the state's Title V operating and Prevention of Significant Deterioration ("PSD") construction permits. On May 4, 2006, Cash Creek applied for a PSD/Title V permit for a new 700 megawatt (MW) electric power generation facility, which would use Integrated Gasification Combined Cycle (IGCC) technology to burn synthetic gas (syngas) produced from coal.[4] KDAQ proposed Permit V-07-017 to U.S. EPA on November 30, 2007; several of the present petitioners petitioned the Administrator to object to Permit V-07-017 in January and February 2008. Cash Creek received a final Permit V-07-017 from KDAQ on January 18, 2008.[5] On December 15, 2009, the Administrator objected to Permit V-07-017, granting several of the issues in the 2008 petitions.

Less than four months after KDAQ issued the final V-07-017 permit, on May 7, 2008, Cash Creek submitted an application for a significant revision to Permit V-07-017.[6] In its significant revision permit application, Cash Creek proposed to modify its coal gasification process, add a methanation process to convert the coal-derived syngas to substitute natural gas, and change the fuel used in the IGCC turbines from syngas to natural gas or substitute natural gas.[7] Cash Creek's proposed revisions were so significant that KDAQ ruled it would terminate Permit V-07-017 and issue a new permit, Permit V-09-006, in its place.[8]

[4] Exhibit 6, KDAQ, Draft Permit Statement of Basis, Permit V-07-017, April 30, 2007 ("April 2007 SOB"), p.1.
[5] Exhibit 7, KDAQ, Final Permit Statement of Basis, Permit V-09-006, May 3, 2010 ("May 2010 SOB"), p.1.
[6] *Id.*
[7] *Id.*
[8] *Id.* at 1-2.

KDAQ published notice of a public hearing on draft Permit V-09-006 on September 9, 2009, and held a public hearing on the draft permit on October 9, 2009.[9] EPA submitted written comments highlighting several deficiencies in draft Permit V-09-006 on the day of the public hearing.[10] Petitioners also submitted timely public comments pointing out several flaws in the draft Permit.[11] After the public hearing, KDAQ made significant changes to the draft permit and published a second notice of public hearing on December 15, 2009; a second public hearing was held January 15, 2010. Again, Petitioners timely submitted public comments, noting that KDAQ failed to adequately address most of its earlier comments, and raising additional issues with the revisions to the draft permit.[12] Nonetheless, KDAQ terminated Permit V-07-017 and issued Permit V-09-006 on May 5, 2010.

II. STANDARD OF REVIEW.

In reviewing a Title V petition, the Administrator must object where petitioners "demonstrate" that the permit "is not in compliance with the requirements of [the Clean Air Act], including the requirements of the applicable implementation plan." *See* 42 U.S.C. § 7661d(b)(2). The Administrator explains in her August 2009 Order for the Trimble Generating Station that the EPA will "generally look to see whether the Petitioner has shown that the state did not comply with its SIP-approved regulations governing PSD permitting or whether the state's exercise of discretion under such regulations was unreasonable or arbitrary."[13] This inquiry includes whether the permitting authority "(1) follow[ed] the required procedures in the SIP; (2) [made] PSD determinations on reasonable grounds properly supported on the record; and (3) describe[d] the determinations in enforceable terms."[14]

To guide her review, the Administrator has looked to the standard of review applied by the Environmental Appeals Board ("EAB") in making parallel determinations under the federal

[9] *Id.* at 1.
[10] *Id.*
[11] Exhibit 2, October 2009 Comments.
[12] Exhibit 3, January 14th Comments.
[13] Exhibit 8, In the Matter of Louisville Gas and Electric Company, Trimble County, Kentucky, Title V/PSD Air Quality Permit # V-02-043 Revisions 2 and 3, Order Responding to Issues Raised in April 28, 2008 and March 2, 2006 Petitions, and Denying in Part and Granting in Part Requests for Objection to Permit, August 12, 2009 ("August 2009 Trimble Order") at 5 (*citing In re East Kentucky Power Cooperative, Inc.* (Hugh L. Spurlock Generating Station) Petition No. IB-2006-4 (Order on Petition) (August 30, 2007); *In re Pacific Coast Building Products, Inc.* (Order on Petition) (December 10, 1999); *In re Roosevelt Regional Landfill Regional Disposal Company* (Order on Petition) (May 4, 1999)).
[14] *Id.* (*citing* 68 Fed. Reg. 9,892 (March 3, 2003) and 63 Fed. Reg. 13,795 (March 23, 1998)).

PSD permit program.[15] The EAB recently has reiterated the importance of BACT determinations, stating that they are "one of the most critical elements in the PSD permitting process and thus 'should be well documented in the record, and any decision to eliminate a control option should be adequately explained and justified.'" *In re Desert Rock Energy Company, LLC*, PSD Appeal Nos. 08-03, 08-04, 08-05, & 08-06, Slip Op. at 50 (September 24, 2009) ("*Desert Rock*"). The Board has remanded permits where the permitting authority's BACT analyses were "incomplete or the rationale was unclear." *Id.* Thus, the Administrator should review KDAQ's BACT determinations with an eye to the completeness of the record and underlying rationale. If either of these aspects is inadequate as demonstrated by Petitioners, the Administrator must object. Given the similar centrality of the air quality demonstration, Petitioners believe at least this level of inquiry is needed on air quality modeling issues as well.

III. KDAQ FAILED TO PROVIDE AN OPPORTUNITY FOR MEANINGFUL PUBLIC PARTICIPATION

a. The Public Notice Lacked Required Information.

The Administrator must object because the public notice failed to include the "end date[s]" of the public comment period and U.S. EPA's review period. Under Kentucky's Title V regulations, "the *public notice shall include*… [t]he *end date* of the public comment period" and the "*end date* of the U.S. EPA's review period." 401 KAR 52:100 Section 5(6) and (7) (emphasis added). A failure to comply with mandatory notice requirements is grounds for an objection. *See Sierra Club v. Johnson*, 436 F.3d 1269 (11th Cir. 2006).[16] The dictionary meaning of the word "date" is "a particular month, day, and year at which some event happened or will happen,"[17] "time stated in terms of the day, month, and year,"[18] or "a specified day of a month."[19] Thus, KDAQ is required to specify in the notice itself the day, month, and year on which the public comment period and EPA review period will end.

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[15] *Id.* at fnt. 6. Petitioners note that they disagree with the importation of the EAB's clearly erroneous standard into the Title V process. A "preponderance of the evidence" standard is more appropriate for reviewing state agency Title V determinations, due to, among other things, the centrality of the U.S. EPA's oversight function in Title V.

[16] *See also* Exhibit 8, August 2009 Trimble Order at 5 (the Administrator's review includes whether the permitting agency has complied with the procedural requirements of the SIP).

[17] Random House Dictionary, Random House, Inc., 2010.

[18] American Heritage Dictionary of the English Language, Fourth Ed., Houghton Mifflin, 2009.

[19] *Id.*

However, rather than include the required "end date[s]" in the notice, KDAQ states merely that written comments "must be received within 30 days following the date of this notice."[20] With respect to the U.S. EPA's 45-day review period, the notice includes a similar statement and ironically references a U.S. EPA website where the public can obtain more information on the federal agency's review period.[21] The omission of the *dates* from the notices violates the plain language of the regulations.

In addition, even if the public could ascertain the date of the notice independently from the notice itself, the omission of the *end* dates creates confusion about when the periods actually close. In Kentucky, confusion has arisen in part due to a lack of clarity about how the agency counts the 30-day period. Prior to January 2010 and thus during the comment period for the Permit, KDAQ interpreted its regulations to *include* the date of notice in the required 30 day period.[22] KDAQ subsequently modified its position after consulting with its attorneys and clarified that the 30 days begins the day *after* publication.[23] The purpose of the explicit requirement to include the end dates of the periods is to avoid such confusion. Confusion as to the end dates consumes the public's critical comment time in a manner that detracts from the already limited opportunity to comment. This lost time is especially problematic in a state such as Kentucky, which has repeatedly refused to extend the public comment period when requested and in fact has read its regulations to prohibit extensions beyond the 30 day period.[24]

For these reasons, the Administrator must object and direct KDAQ to renotice the permit including the end dates for the 30-day comment period and U.S. EPA's review period in the notice itself. At minimum, the Administrator should require KDAQ to comply with the notice requirements in all future permit proceedings by including the end dates for the public and U.S. EPA review periods in the notices themselves, as the Kentucky SIP explicitly requires.

[20] *See, e.g.*, Exhibit 9, KDAQ, Air Quality Permit Notice, Permit # V-09-006.
[21] *Id.* "U.S. EPA has up to 45 days following issuance of the proposed permit to submit comments. The status regarding EPA's 45-day review of this project and the deadline for submitting a citizen petition will be posted at the following website address: http://www.epa.gov/region4/air/permits/ Kentucky.htm shortly after the end of this 30-day comment period."
[22] *See* Exhibit 10, email from James Morse, KDAQ, to Faith Bugel, ELPC, "Public Comment Period for KY Syngas," January 6, 2010 ("Kentucky Syngas Email"). It is Petitioners' understanding that this interpretation was not in keeping with either that of U.S. EPA or other states.
[23] *See id.*
[24] *See* Exhibit 11, Email from John Lyons, Director, DEP, NRPPC, to Meleah Geertsma, ELPC, June 19, 2007 (stating in response to request for extension of a public comment period due to the newness of the technology that "401 KAR 52:100, Sections 2(2)(a) & 2(2)(b), are *very prescriptive* in that the comment period 'shall' begin on the date the notice is published and *'shall' end thirty (30) days after the publication date*" (emphasis added)).

b. KDAQ Omitted Several Categories of Required Permit Application Information and Supporting Materials During the Public Comment Period.

The Administrator must object because KDAQ omitted numerous required analyses and supporting materials from the record available for public review during the comment period, depriving the public of a meaningful opportunity for comment. The Cash Creek application is a thin document backed by insufficient supporting information, where any supporting information is provided at all. As the text of the Title V regulations requires substantially more information, the Administrator must object.

Under state and federal regulations, a Title V application must include detailed emissions information for all sources of emissions (including emission calculations), control technology and compliance information, and "information that may be necessary to implement and enforce other applicable requirements of the Act or of [Title V] or to determine the applicability of such requirements." 40 C.F.R. 70.5(c). By failing to make necessary information "available for review during the title V public comment process," KDAQ violated the Clean Air Act's implementing regulations. *In the Matter of WE Energies Oak Creek Power Plant*, Permit No. 241007690-P10, Order Responding to Petitioner's Request that the Administrator Object to Issuance of State Operating Permit, June 12, 2009, at 24 (citing 40 C.F.R. § 70.7(h)(2)); *see also In re RockGen Energy Center*, 8 E.A.D. 536, 552-55 (EAB 1999) (failure to include startup, shutdown and malfunction plan in the permit and subject it to public comment).

The categories of required information that were shielded from public scrutiny during the Cash Creek public comment period are numerous and serious. They include, but are not limited to, the following:

(1) supporting information for numerous emission factors for, among other things, VOCs and H_2SO_4 from the combustion turbine, CO, VOCs, NO_x, PM and SO_2 from the aspirator, and these same pollutants from the emergency generator;
(2) estimates of fugitive emissions from valves, leaks, flanges, and other similar sources, in part relied on to escape PSD for VOCs and H_2S;
(3) the leak detection and repair ("LDAR") plan relied on to control fugitive emissions, as well as the estimated controlled emissions under that plan and supporting materials for those emissions estimates;
(4) the basis for the assumed heat content of the natural gas burned in the combustion turbines;
(5) emissions information and supporting materials necessary for the BACT

determinations, where the Applicant and KDAQ failed to provide either the types of sources (final or draft permits, test data, vendor guarantees, etc.) reviewed in reaching their BACT analyses or the actual information that each of these sources provided;

(6) a cost-effectiveness analysis to support rejection of lower sulfur coal in the BACT process;

(7) a cost-effectiveness analysis to support rejection of dry cooling in the BACT process; and

(8) a flare operation plan to control flaring emissions.

In Petitioners' January 2010 comments on the draft permit for the Cash Creek facility, Petitioners pointed out that the information listed above was missing entirely from the permitting record, and that this information must be submitted to KDAQ and made available to the public before issuance of a proposed Title V permit.

In its response to this comment, KDAQ essentially acknowledged that this information is needed to issue the Permit and included new analyses, terms and conditions, but maintained that "no further public comment period is warranted" because "no permit limits or conditions have been relaxed."[25] KDAQ's position – that the express requirements of 40 C.F.R. 70.5 and 70.7(h) can be disregarded – violates the Clean Air Act's implementing regulations. Moreover, KDAQ fails to acknowledge that its violation of these requirements deprives the public of the opportunity to comment on the sufficiency of the proposed Permit's new analyses and additional permit terms and conditions, which themselves may (and as set forth below, in fact do) continue to fall short of CAA requirements. For these reasons, the Administrator should object and direct KDAQ to make *all* necessary information available to the public and to hold an additional public comment period prior to the issuance of a revised proposed Title V permit.

IV. THE POST HOC ANALYSES OF EMISSIONS FROM ACTIVE FLARING AND BACT FOR THE FLARE ARE IN ERROR.

The Administrator must object because the Applicant and KDAQ relied on a faulty and incomplete assessment of emissions from active flaring, as well as a flawed BACT analysis and inadequate BACT limits for the flare. Errors in estimating emissions from the flare are significant because the agency used the estimates to support its determination that the proposed

[25] *See, e.g.*, Exhibit 12, KDAQ, Comments and Response on the Draft Permit V-09-006, March 2010 ("RTC") at B-9 to B-10.

facility is a minor source of VOCs, H_2S, and HAPs. The flawed BACT limits, in turn, fail to ensure the maximum reduction in pollution from the flare.

a. PTE Must Include Startup, Shutdown and Malfunction Emissions, Including Those From Active Flaring.

The applicable Kentucky SIP provision states in relevant part as follows concerning calculation of a source's PTE:

> "Potential to emit" or "PTE" means the maximum capacity of a stationary source to emit a pollutant under its physical and operational design, and shall:
>
> (a) Include air pollution control equipment and restrictions on the hours of operation or on the type or amount of material combusted, stored, or processed, if the limitation or its effect on emissions is federally enforceable; and
>
> (b) Not include secondary emissions.

401 KAR 50:010 Section 1(103). In short, this provision requires first that PTE reflect the *maximum* capacity to emit a pollutant. As flares emit pollutants and contribute to this maximum capacity, their emissions must be included in PTE. Nowhere does the definition make a blanket exception for emissions during startup, shutdown and malfunction ("SSM") of the facility. The definition also requires that, to the extent that the applicant or agency claims that maximum capacity to emit is constrained in any way, the constraint must be explicitly set forth in the permit as a *physical or operational* limit – i.e., a specific limit on fuel, hours of operation, or pollution control equipment operating parameters – that is practicably enforceable.

Emissions from the use of flares furthermore must be included in PTE calculations because flares are emissions units whose purpose is to control release of gases from process units. Determining if PSD applies to a particular pollutant first involves calculating whether the project will result in a "significant emissions increase." This process entails adding together the "potential to emit" of each "emissions unit." 401 KAR 51:017E Section 1(4)(a)(2).[26] The Kentucky SIP defines "emissions unit" broadly to include "any part of a stationary source... that emits or has the potential to emit a regulated NSR pollutant." 401 KAR 51:001 Section 1(66).

[26] "Actual-to-potential test for projects that involve only construction of new emissions units. A significant emissions increase of a regulated NSR pollutant shall be projected to occur if *the sum of the potential to emit from each new emissions unit* following completion of the project equals or exceeds the significant amount for that pollutant" (emphasis added).

Flares are emissions units, in that they actually emit regulated NSR pollutants. Indeed, the U.S. EPA Environmental Appeals Board ("EAB"), the agency's adjudicative body, has specifically recognized that flares are "among the [ ] *emissions units* that will contribute to the increase" in pollutants counted towards triggering PSD or NNSR review. *See In re: ConocoPhillips Co.*, PSD Appeal No. 07-02, Order Denying Review in Part and Remanding in Part, at 8-9 (EAB June 2, 2008)[27] Moreover, flares emit pollutants while operating under their design to control emissions from the larger facility, e.g., during periods of facility SSM. The PTE of a flare under the significant emissions increase prong therefore means the maximum capacity of that flare to emit a pollutant during active flaring. It follows that all active flaring emissions must be included in the significant emissions increase calculation.

U.S. EPA determinations and guidance interpreting the controlling federal regulatory definition make clear that facility SSM emissions *must* be included in PTE calculations. This issue has been squarely addressed in a recent response to a Title V petition emphasizing that the massive pollution from flares must be addressed in permitting. The Administrator objected to the permit in that case for its failure to fully take account of flaring emissions, either by including them in PTE or limiting them under federally enforceable permit conditions.[28] In addition, in prior comments on a PSD permit, U.S. EPA has stated straightforwardly that "[t]he regulations do not provide exemptions for excluding startup emissions from a facility's Potential to Emit (PTE)."[29] The agency likewise has issued guidance to states stating as follows:

> The consensus is that for the purposes of determining PTE in the New Source Review (NSR) and Title V programs, EPA has no policy that specifically requires exclusion of "emergency" (or malfunction) emissions. Rather, to determine PTE, a source must estimate its emissions based on the worst case scenario taking into account startups, shutdowns, and malfunctions.[30]

[27] The EAB further bolstered the requirement to treat flares as emissions units by its remand of the permit at issue to the state agency for a proper PSD program review of the Best Available Control Technology ("BACT") for flaring emissions. *See In re: ConocoPhillips*, at 27-36. The EAB's ruling requiring BACT for flares cannot be reconciled with KDAQ's attempt to omit active flaring emissions from PTE.

[28] *See* Exhibit 13, *In the Matter of BP Products, North America, Inc., Whiting Business Unit*, Order Partially Denying and Partially Granting Petition for Objection to Permit, October 16, 2009 ("BP Title V Order"), at 5-7.

[29] Exhibit 14, U.S. EPA Comments on the Draft Prevention of Significant Deterioration (PSD) Permit, AP-5873, to Construct at Medicine Bow Fuel and Power's Industrial Gasification and Liquefaction Plant, August 4, 2008.

[30] *See* Exhibit 15, Letter from Steven C. Riva, U.S. EPA to William O'Sullivan, Division of Air Quality, N.J. Dept. of Environmental Protection, February 14, 2006 (emphasis added).

Without such a requirement, the purpose of NSR – to protect air quality by requiring stringent control of polluting facilities – would be significantly weakened. Facilities, moreover, would have little incentive to minimize SSM to the greatest extent possible in the design and operation planning stages.

With regards to limiting PTE, courts have emphasized the need to ensure that any constraints assumed on potential to emit are grounded in enforcement reality. *United States v. Louisiana Pacific Corp.*, 682 F. Supp. 1122 (D. Colo. 1987).[31] *See also Weiler v. Chatham Forest Products*, 392 F. Supp. 532, 535 (2nd Cir. 2004).[32] The *Louisiana Pacific* court described PTE as "the cornerstone of the entire PSD program," and observed that allowing illusory and unenforceable limits to curtain PTE would create a loophole that could effectively wipe out PSD requirements entirely. 682 F. Supp. at 1133. To include enforceable limits on PTE, the permit must create mandatory obligations (standards, time periods, methods). Specifically, a permit condition must: (1) provide a clear explanation of how the actual limitation or requirement applies to the facility; and (2) make it possible for KDAQ, U.S. EPA, and citizens to determine whether the facility is complying with the condition. *See, e.g., Sierra Club v. Ga. Power Co.*, 365 F. Supp. 2d 1297, 1308 (D. Ga. 2004) (citing *Sierra Club v. Public Serv. Co.*, 894 F. Supp. 1455, 1460 (D. Colo. 1995)). The requirement that PTE calculations be made enforceable through adequate permit limits was recently upheld by the Administrator in her objection to the Title V permit for BP's Whiting facility. Under the relevant Kentucky SIP provision, caselaw, and U.S. EPA guidance[33], the only limits that render a design limitation on emissions enforceable for purposes of PTE are specific restrictions on operation and design set forth in the permit, adherence to which can be verified by authorities. Permit conditions "requir[ing] monitoring

[31] The specific holding of *Louisiana Pacific* – that limits on PTE must be federally enforceable – has been overruled by authority stating that the limits may also be "enforceable as a practical matter." *See National Mining Ass'n v. USEPA*, 59 F.3d 1351 (D.C. Cir. 2004) (holding that limits on PTE must be enforceable as a practical matter but need not necessarily be federally enforceable). However, the basic principles concerning PTE articulated in Louisiana Pacific remain standing.

[32] "In short, then, a proposed facility that is physically capable of emitting major levels of the relevant pollutants is to be considered a major emitting facility under the Act unless there are legally and practicably enforceable mechanisms in place to make certain that the emissions remain below the relevant levels."

[33] 401 KAR 52:001(56); *Louisiana Pacific*, *supra* and *Weiler*, *supra*; Exhibit 16, Terrell Hunt, Associate Enforcement Counsel, U.S. EPA Air Enforcement Division, and John Seitz, Director, U.S. EPA Stationary Source Compliance Division, "Guidance on Limiting Potential to Emit in New Source Permitting," (June 13, 1989).

only, and [not specifying] measures by which emissions will be limited to prevent their exceeding the PSD/NNSR significance levels" do not constitute sufficient limits on PTE.[34]

b. KDAQ Failed to Estimate the Full Emissions From Active Flaring.

During the public comment period, Petitioners raised concerns with potential emissions from active flaring, which will occur when the facility goes through SSM.[35] Petitioners specifically commented on underestimation of flaring emissions during startup and the complete omission of flaring emissions during shutdown and malfunction. KDAQ responded by putting forth several arguments. None of these arguments hold weight, as set forth below.

First, KDAQ claims as a general matter that PTE excludes malfunctions, citing to the definitions of PTE and malfunction in the state SIP and concluding that "Kentucky regulation does not consider a malfunction as representative of normal operation."[36] This conclusion is in error, as it ignores the regulation's unit-by-unit PTE summation process outlined above and is contrary to U.S. EPA's interpretations regarding PSD applicability. While KDAQ cites to the Administrator's 2008 Title V Order for the Trimble County Generating Station[37], the footnote it cites is inapposite for several reasons. First, the argument set forth in the footnote also is contrary to a direct reading of the unit-by-unit PTE summation process as it applies to flare emission units. The Trimble case did not involve a flare (an emission unit whose purpose is to operate while the facility is going through SSM), so is not directly relevant to the particular issue in this case, i.e., whether emissions from this particular emission unit must be included in the PSD applicability determination for a new source. Second, the definition of "*actual* emissions" relied on in the footnote, 401 KAR 51:001 Section 1(2)(a), is not directly relevant to determining *potential* emissions. Moreover, even if this definition of "actual emissions" were instructive as to PTE, the definition explicitly states that it "does not include: 1. Calculating if a significant emissions increase has occurred," 401 KAR 51:001 Section 1(2)(d), which is the very question at issue here. For these reasons, KDAQ erred in concluding that PTE excludes malfunctions as a matter of regulatory interpretation.

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[34] *See* Exhibit 13, BP Title V Order, at 8-9.
[35] Exhibit 3, January 14th Comments, at 9-14.
[36] Exhibit 12, RTC, at B-30.
[37] *Id.*, at B-30 (*citing* "U.S. EPA LG&E Trimble Order in Response to Petition No. IV-2008-3, at 18, n. 20").

Second, KDAQ claims that shutdown (and therefore malfunction) emissions are included in the PTE previously reported in the application.[38] The theory backing KDAQ's claim is that the emission reductions from process equipment going offline during SSM will always outweigh increased emissions from the flare during the same events. KDAQ specifically concludes that "[t]here is no situation during a malfunction where emissions would be greater than that [sic] which would occur during steady state operations."[39] However, KDAQ fails to back its statements with any quantitative analysis of different malfunctions that could occur, and underestimates flaring emissions during SSM by citing unsupported emission estimates for only one limited shutdown scenario.

The sole shutdown scenario presented in the Response to Comments is one where a single gasifier shuts down, while another starts up. This shutdown scenario is not representative of malfunctions, but instead represents a planned shutdown. KDAQ only provided an estimation of shutdown emissions for this one very particular scenario, citing reductions from process equipment shutdown of, for example, 5.2 lbs of VOCs.[40] DAQ only estimated that emissions generated from the flare from this process shutdown would be 0.4 lbs of VOCs. Flaring emissions under many scenarios *not* considered by DAQ can go far higher than 0.4 lbs., and in fact can result in tons of emissions in one day. System upsets and malfunctions could cause flaring even without other equipment shutting down, where gas mixes become non-optimal fuel for the flare, and where "burps" of short term flaring occur. Furthermore, the entire facility could face an emergency causing complete shutdown. In sum, many other malfunctions could occur, and flare emissions during these events could significantly exceed emissions reported for the single scenario of a planned shutdown For these reasons, KDAQ erred in concluding that the reported PTE includes all shutdown and malfunction emissions as a technical matter. This underestimation of flaring emissions is especially of concern given the slim margin by which the facility avoided full PSD review for VOCs.

[38] *Id.*, at B-31.
[39] *Id.*,, at B-31.
[40] *Id.*, at B-35.

c. The Permit Lacks Enforceable Conditions to Ensure Low Levels of Flaring Emissions.

On top of these failures to estimate flaring emissions, the Permit does not contain many specific terms and conditions necessary for ensuring compliance with its own requirements, and for maintaining consistency with the assumptions of the application and minor source determinations. It does not, in other words, contain enforceable limits on the flare's PTE. For example, the Permit is substandard compared with established flare minimization, flare monitoring, flare recordkeeping, quality assurance and control, and other requirements of the BAAQMD flare monitoring and control rules, and combined rule of SCAQMD 1118.[41] A comparison of these requirements and the Permit's shortcomings are as follows.

First, the Permit does not actually require flare minimization to ensure that the facility does not exceed the (unenforceable) 36 tpy source-wide VOC limit or other requirements. Instead, the Permit only contains generalized Good Engineering Practices requirements (Section E), and requirements to take reasonable steps to minimize levels of emissions (not specifically flaring) exceeding standards during an emergency (Section G). In addition, there is no flare minimization plan required for Cash Creek, just a requirement for an operation plan consisting of a description of what Cash Creek plans to do, which the Applicant may submit to the agency after startup of the facility.[42] The Permit lacks any required process and/or standards for KDAQ's approval or disapproval of this plan. In addition, the Permit contains no provision for public or U.S. EPA review of and comment on the adequacy of the plan, or process for revising the plan as factors impacting flaring change.

In contrast, the BAAQMD rules require flare minimization, allowing flaring only as necessary in an emergency and as set forth in an approved Flare Minimization Plan ("FMP"). The FMP must be submitted to BAAQMD for certification and submitted for public review and comment, and must be revised on a regular basis to account for factors that may impact flaring over the life of the facility, e.g., changes in process equipment, inputs, and flare condition. This FMP must include the following:

- Technical Data: Description and technical information for each flare capable of receiving

[41] Exhibit 17, BAAQMD, Regulation 12, Rule 11, Flare Monitoring at Petroleum Refineries ("BAAQMD Rule 11 Flares"); Exhibit 18, BAAQMD, Regulation 12, Rule 12, Flares at Petroleum Refineries ("BAAQMD Rule 12 Flares"); and Exhibit 19, SCAQMD, Regulation 1118, Control of Emissions From Refinery Flares.
[42] Exhibit 1, Permit at 44-45 of 101, Cond. 5.

gases and upstream equipment and processes that send gas to the flare including:

- Detailed process flow diagram accurately depicting all pipelines, process units, flare gas recovery systems, water seals, surge drums and knock-out pots, compressors and other equipment that vent to each flare. At a minimum, the diagrams must include full and accurate as-built dimensions and design capacities of the flare gas recovery systems, compressors, water seals, surge drums and knockout pots.
- Full and accurate descriptions of the locations of all associated monitoring and control equipment.

Nowhere does the Permit require such critical information for ensuring short- and long-term compliance with the assumed low levels of flaring emissions or other supposed flare permit limits.

Nor does the Permit identify any specific flare monitoring requirements or detection limits for flare gas composition, or any specific detection limits for monitoring flow, or any specific quality assurance requirements. The Permit also has few data reporting requirements. All of these requirements are needed to ensure compliance with the source-wide 36 tpy VOC limit and other requirements to minimize startup, shutdown, and routine flaring emissions. Such an omission is in contrast to the many specific requirements in both the BAAQMD and SCAQMD rules for monitoring procedures.

BAAQMD data reporting provisions also require significantly more detailed reports for ensuring compliance than does the Permit. The BAAQMD reporting requirements include:

- Electronic Monthly Report to agency
- Volumetric flow for each day, for month, and hour.
- Composition (if sampling, total hydrocarbon as propane by volume, methane by volume, and, H_2S by volume, and if any additional compounds, the content by volume of each); (if vent gas composition monitored by a continuous analyzers: average total hydrocarbon as propane by volume, average methane by volume, and total reduced sulfur by volume or H_2S by volume flared for each hour, and if additional compounds monitored, average content by volume for each additional compound for each hour).
- Molecular weight: If flow monitor measures molecular weight, the average for each hour of the month.
- Pilot and purge gas: Type of gas used, volumetric flow for each day and the month, and means used to determine flow.
- Downtime: Flare monitoring system downtime periods, including dates and times.
- Archive Video monitoring: The archive of images recorded for the month for video monitoring (and many details on how to do continuous video monitoring of flare)
- Daily reporting of methane, non-methane, SO_x: For each day and for the month provide calculated methane, non-methane and sulfur dioxide emissions. For the purposes of calculations only, flare control efficiency of 98 percent shall be used for hydrocarbon

flares, 93 percent for flexi-gas flares or if, based on the composition analysis, calculated lower heating value of vent gas is <300 BTU/SCF.

- Flow Verification Report every six months for each flare, included in the corresponding monthly report. The report shall compare flow as measured by the flow monitoring equipment and a flow verification for the same period or periods of time,
- Development, implementation, and maintenance of the written operation plan

Finally, Cash Creek's supposed compliance Determination in Section D of the permit is just a formula without actual measurement. As set forth elsewhere in these comments, Section D contains an unenforceable circular equation that assumes without basis what startup emissions will be per hour, then multiples 1,328 lbs/hour times the number of hours times an assumed high destruction efficiency (99.5 percent), and does not measure shutdown at all. For pilot gases, Section D also contains a formula without measurement of hourly emissions times the number of hours per month. The Permit provides no way to assure that 1,328 lbs/hour is met during startup, and no way to assure that 99.5% destruction efficiency is met.

d. The Flare Permit Measures Are Not BACT.

In addition to underestimating flare emissions during facility SSM, KDAQ failed to include proper BACT limits for the flare. KDAQ identifies the flare as an "Emission Unit[ ] Subject to BACT Analysis."[43] Nowhere, however, does it conduct the required top-down process for determining BACT for the flare. KDAQ instead lists the flare in the general category of "combustion equipment," for which it only then lists combustion and post-combustion control strategies and technologies, none of which apply directly to the flare and flaring emissions.[44] KDAQ then lists the flare as an "auxiliary combustion source," for which it again provides no discussion of control options apart from a general discussion of the inappropriateness of using add-on controls on sources that are used on a limited basis.[45] KDAQ concludes its supposed BACT flare analysis by stating only as follows:

> Review of recently permitted and proposed natural gas production plants and electric generating stations disclosed no instances where natural gas fired flares

[43] Exhibit 20, KDAQ, Proposed Permit Statement of Basis, Permit V-09-006, March 1, 2010 ("March 2010 SOB") at 20-21 of 51.
[44] *Id.*, at 27 to 28 of 51, Table 4-3; *see also id.* at 29 to 30 of 51 (discussing technical feasibility of control options for combustion sources).
[45] *Id.*, at 30 of 51.

> included any form of add-on control technologies. The applicant proposes proper design, operation and maintenance, and combustion of natural gas as BACT for the flare.[46]

The March Statement of Basis omits any discussion of what constitutes proper design, operation and maintenance of the flare. In addition, KDAQ's BACT analysis only applies to the flare pilot and flaring during facility startup.[47]

This brief and vague treatment does not constitute a proper BACT determination. First, KDAQ does not make a BACT determination for shutdown and malfunction, contrary to the requirement that BACT apply during all periods.[48] As described above, KDAQ failed in the first instance to assess malfunction emissions, and so could not have assessed maximum reduction of these emissions.

Second, KDAQ fails completely to explain what specific design, operation and maintenance measures are required at the flare, and how these measures ensure the maximum reduction in emissions achievable at the flare consistent with BACT requirements. Terms and conditions covering facility shutdown and malfunction emissions from flare that *are* in the Draft Permit are not supported by a proper top-down BACT analysis. The following terms and conditions (arguably) apply to the flare during facility shutdown and malfunction:

(1) operating limits requiring that "[t]he process gases that are vented to the flare must be vented at a constant rate over a minimum of an eight (8) hour period, to ensure that the vented pollutants do not exceed the rate that would have occurred from the processes during normal operations," and "[t]he maximum number of shutdown events shall not exceed 52 events (the same number of startup events permitted)"[49],
(2) an emission limit on visible emissions that applies at all times,
(3) source-wide emission limits on VOCs and H_2SO_4,
(4) a vent monitoring requirement to measure and record the date and time of flaring events and the volume of waste gas vented to the flare, and
(5) various recordkeeping provisions generally requiring a plan that includes root cause analysis for emergency events and corrective action, plus calculation of emissions on a monthly and annual basis[50].

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[46] *Id.*, at 41 of 51.
[47] *Id.*, at 41 to 42 of 51, Tables 4-25 ("BACT Selection for Flare Pilot") and 4-26 ("BACT Selection for Flare during Start-up").
[48] *See, e.g.*, Exhibit 21, In the Matter of Louisville Gas and Electric Company, Partial Order Responding to March 2, 2006 Petition, and Denying in Part and Granting in Part Request for Objection to Permit Revision 2, September 10, 2008, at 10; *see also Sierra Club v. EPA*, 551 F.3d 1019 (D.C. Cir. 2008) (finding for the analogous MACT program that the EPA's the SSM exemption violates the CAA's requirement that some Section 112 standard apply continuously).
[49] Exhibit 1, Permit at 42, Cond. 1(c)(2) and (3).
[50] *Id.* at 44-46.

None of these limits is supported by a top-down BACT analysis that covers flares, and indeed nothing in the record suggests that most of these limits had any direct connection to BACT.

KDAQ added the operating limits requiring venting to the flare at a constant rate and limiting shutdown flaring to 52 events in response to Petitioners' comments. However, KDAQ appeared to pick these numbers at random, as there is no supporting information in the record. There are no calculations or other information showing that the required venting rate will actually keep flare emissions below emissions from process equipment that would have occurred over the same period. That KDAQ failed to estimate a whole range of malfunction flaring emissions strongly suggests that the selected venting rate cannot keep emissions below those that would have occurred from process equipment. Nor is there any analysis showing that 52 shutdowns (or the 52 allowed startups, for that matter) are the minimum number of shutdown events consistent with BACT for the gasification plant operations.

As for the remainder of the limits, the emission limit on the visible emission limit is included pursuant to 401 KAR 63:015[51], a general state limit on particulate matter emissions from flares. The VOC and H_2SO_4 limits are included to avoid applicability of PSD for these two pollutants and do not include emission rates for flaring during shutdown and malfunction. The monitoring and reporting requirements are included as CAM measures and pursuant to state Title V requirements.[52] None of these measures have any connection to the require BACT analysis and limits.

The Applicant and KDAQ also have not demonstrated that imposing and complying with an emission limit for periods of shutdown and malfunction is infeasible. This showing is required in order to justify the use of a work practice or operating standard in place of an emission limit. *See* 40 C.F.R. 51.166(b)(12).[53] Even if a work practice or operational standard is justified, the permit must include as part of that standard "the emissions reduction achievable by implementation of such design, equipment, work practice or operation, and shall provide for

[51] *Id.*, at 43, Cond. 2.c

[52] *Id.* at 44-45, Cond. 4 and 5 (*citing* 40 C.F.R. 64.3, 64.7, and 64.9, as well as 401 KAR 52:020 Section 26)).

[53] "If the reviewing authority determines that technological or economic limitations on the application of measurement methodology to a particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard or combination thereof, may be prescribed instead to satisfy the requirement for the application of best available control technology. Such standard shall, to the degree possible, set forth the emissions reduction achievable by implementation of such design, equipment, work practice or operation, and shall provide for compliance by means which achieve equivalent results"; 401 KAR 51:001 Section 1(25)(c).

compliance by means which achieve equivalent results." *Id.* No such emissions reduction is included in the Permit's monitoring and recordkeeping requirements for the flare.

Nor do the provisions outlining the requirements for a to-be-submitted flare operation plan, or the reporting requirements, qualify as BACT.[54] KDAQ "expanded on the elements of the operation plan that are to be addressed and [ ] added specific criteria that will trigger a root cause analysis" in response to Petitioners' comments regarding the inadequacy of the design and operation plan.[55] The agency based these additions on the New Source Performance Standards ("NSPS") for petroleum refineries, 40 C.F.R. 60, Subpart Ja[56], recognizing that flare minimization requirements at refineries are relevant to the flare at the proposed gasification plant. However, BACT must start at the NSPS, not end there, if other sources provide relevant examples of more stringent requirements. *See* 40 C.F.R. 51.166(b)(12) ("In no event shall application of best available control technology result in emissions of any pollutant which would exceed the emissions allowed by any applicable standard under 40 CFR parts 60 and 61.") KDAQ ignored more stringent flare operation plan requirements under Bay Area Air Quality Management District Regulation (BAAQMD) 12, Rule 12 for Flares at Petroleum Refineries, as described above with respect to enforceability.[57]

V. THE POST HOC ANALYSES OF FUGITIVE EMISSIONS FROM, AND CO BACT FOR, EQUIPMENT LEAKS ARE IN ERROR.

The Administrator must object because the underlying emission estimates and BACT analysis for fugitive equipment leaks are based on numerous unreasonable and unsupported assumptions, as well as omissions. The Permit, in turn, does not contain enforceable terms and conditions sufficient to ensure that actual emissions from equipment leaks will not significantly exceed those assumed in the minor source determination. These shortcomings are critical because KDAQ relied on the faulty analysis to support its determinations that the facility is a minor source of VOCs, H_2S, and HAPs. In addition, KDAQ failed to adopt limits that represent

[54] This substantive issue with the flare operation plan is separate from and in addition to the public participation violation resulting from a failure to provide the plan for public comment along with the draft permit, as set forth above.
[55] Exhibit 12, RTC, at B-58.
[56] *Id.* at B-58.
[57] Exhibit 18, BAAQMD, Rule 12 Flares..

BACT for CO from equipment leaks. As the minor source determinations are in error and the BACT analysis is flawed, the Administrator must object.

a. **KDAQ Relied on Post Hoc Estimations of Fugitive Emissions From Equipment Leaks and a BACT Analysis for Leaks Submitted After the Public Comment Period.**

In making its faulty determinations that the proposed facility is a minor source of VOCs, H_2S and HAPs, KDAQ relied in part on an after-the-fact and flawed analysis of fugitive emissions from equipment leaks submitted by the Applicant. Petitioners pointed out the total omission of fugitive leak emissions from the permit application in their comments on the draft permit.[58] In response, KDAQ requested such an analysis from the Applicant, who then submitted an estimation of emissions and proposed CO BACT limits contained in a letter and attachments.[59] These materials were not made available to the public as part of any additional comment period. Moreover, the materials themselves provide no basis for several important assumptions, as set forth below.

KDAQ adopted the analysis without any changes in issuing the final permit. To the Permit itself, KDAQ added a new section for fugitive equipment leaks and several additions to other sections of the Permit. The fugitive equipment leaks section includes (a) a table listing an "approximate count of the equipment" as of the date of permit issuance, (b) operating requirements to apply an LDAR program as BACT for CO, as well as for compliance with the source-wide limits on VOCs and H_2S contained in Section D of the Permit, (c) emission limitations of 1.39 tpy of CO, 12-month rolling average, based on the LDAR program, and the Section D source-wide limits on VOCs and H_2S, and (d) monitoring requirements constituting the LDAR program based on a Texas Commission on Environmental Quality ("TCEQ") program.[60] Section D in turn contains two equations for allegedly determining compliance with the source-wide emission limits on VOCs and H_2S. To account for fugitive equipment leaks, KDAQ added components consisting of "LDAR Emissions VOC lb/month" and "LDAR

[58] Exhibit 3, January 14th Comments, at 8-9.
[59] Exhibit 22, Letter from Michael McInnis, Manager, Cash Creek Generation LLC, to John Lyons, Director, Energy and Environment Cabinet, "Response to Sierra Club Comments Respecting Fugitive Process Emissions," February 19, 2010 ("February 19th Fugitive Leak Letter").
[60] Exhibit 1, Permit at 60 to 64 of 101; Exhibit 22, February 19th Fugitive Leak Letter.

Emissions H_2S lb/month" to the equations.[61] The method for calculating the LDAR emissions in lb/month relies on the emission factors and control efficiencies assumed in the emission calculations.[62]

b. The Post Hoc Estimation of Fugitive Emissions From Equipment Leaks Relies on Unsupported and Improper Assumptions, Resulting in an Underestimation of Emissions.

The Administrator must object because the estimation of fugitive emissions from equipment leaks significantly underestimates emissions through use of improper and unsupported assumptions. Use of appropriate emissions factors, assumptions and methods would result in significant additional annual tons of fugitive VOC and H_2S HAP emissions. By failing to require or provide an analysis of the full potential to emit from equipment leaks, KDAQ allowed the Applicant to improperly qualify as a minor source. The omissions, inaccuracies and unreasonable assumptions are as follows.

i. NSR applicability, estimating Potential to Emit (PTE), and emission factors.

The unit-by-unit process for calculating the project's PTE is set forth above in the section regarding the flare. Fugitive emissions, like those from equipment leaks, are to be included in the NSR applicability determination for all sources listed in 40 C.F.R. 51.166(b)(1)(iii). As the proposed source is a combination of several of the listed sources, fugitive emissions must be included in determining whether the source triggers PSD.

When estimating emissions for purposes of PSD, U.S. EPA emphasizes that "[f]or each emissions unit, the estimate should be based on the most representative data available."[63] In addition, U.S. EPA has provided several notes of caution with respect to the use of general emission factors, as well as guidance on the proper selection of emission factors where other more appropriate sources are not available. The Introduction to AP-42 states as follows on these topics:

> If representative source-specific data cannot be obtained, emissions information from equipment vendors, particularly emission performance guarantees or actual

[61] Exhibit 1, Permit at 85 of 101.
[62] *Id.* at 86 of 101.
[63] Exhibit 23, U.S. EPA, New Source Review Workshop Manual (Draft), October 1990 ("NSR Manual"), at C.2

> test data from similar equipment, is a better source of information for permitting decisions than an AP-42 emission factor. When such information is not available, use of emission factors may be necessary as a last resort. Whenever factors are used, one should be aware of their limitations in accurately representing a particular facility...
>
> Where risks of either adverse environmental effects or adverse regulatory outcomes are high, more sophisticated and more costly emission determination methods may be necessary...
>
> Care should be taken to assure that the subject source type and design, controls, and raw material input are those of the source(s) analyzed to produce the emission factor.[64]

EPA additionally has found that emissions factors have been inappropriately used in permitting situations in ways that underestimate emissions.[65] In particular, as the Administrator has explained, it is improper to employ emission factors developed based on other industries or sources without showing that such factors are appropriate for the particular source at issue.[66]

Problems with inappropriate uses of emission factors in estimating PTE are perpetuated and compounded by basing compliance demonstrations on the very same emission factors used to estimate PTE. Permits must require actual testing of emissions and development of a source-specific emission factor from operations once a source is up and running. Otherwise, the appropriateness of the general or industry-wide emission factor for that particular source can never be verified.

As set forth below, the Applicant and KDAQ failed to provide an adequate basis for their selected emission factors. The chosen factors resulted in emission estimates significantly lower than would have resulted from more appropriate factors. Moreover, the Permit does not require actual testing of fugitive equipment leak emissions, but instead allows the Applicant to demonstrate compliance circularly using the assumed emission factors. This scheme does not ensure that the proposed plant will be a minor source of VOCs, H_2S, and/or HAPs.

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[64] Exhibit 24, U.S. EPA, Introduction to AP-42, Volume I, Fifth Ed., January 1995, at 3-4.

[65] Exhibit 25, *Evaluation Report: EPA Can Improve Emissions Factors Development and Management,* Report No. 2006-0017, March 22, 2006.

[66] *See, e.g.*, Exhibit 13, BP Title V Order, at 11 (objecting where agency failed to respond to comments on the inappropriateness of using emission factors developed for light crude in estimating emissions from processing heavy crude).

ii. The Applicant and KDAQ fail to justify dismissal of higher EPA refinery emissions factors and adoption of SOCMI without ethylene emission factors.

The February 19th letter includes a statement that the applicant used SOCMI (Synthetic Organic Chemical Manufacturing Industry) without ethylene emissions factors, and that the Applicant considered EPA's refinery emissions factors inappropriate. The record provides no indication that any effort was made to identify representative source-specific emission information from similar facilities. In addition, no basis was provided for the reasoning behind the dismissal of EPA's refinery emission factors. The refinery emission factors are more appropriate for gas streams at the proposed facility because the coal-gasification facility will have process streams more like those at an oil refinery, i.e., made up of hydrocarbons, sulfur compounds, hydrogen, metals, steam, and other such compounds. If applied to the same calculations, the refinery emission factors would result in substantially higher emissions from the proposed source, since the refinery emission factors are an order of magnitude or more larger than the chosen SOCMI factors.

Moreover, the Applicant and KDAQ do not demonstrate that the SOCMI without ethylene factors are appropriate for the proposed facility. They ignore the following statement in the TCEQ source document (which they cite for the fugitive equipment leak analysis):

> *The SOCMI factors are generally for use in chemical plants including chemical processes that are located in a refinery. SOCMI factors are divided into three different sets which are applied in different situations.*
> *The original SOCMI average factors were developed to represent fugitive emission rates from all chemical plants.*[67]

The proposed Cash Creek facility is not a synthetic chemical plant, nor does it contain a subset of synthetic chemical plant processing, as some oil refineries contain inside their overall fossil fuel production facilities. Furthermore, U.S. EPA's *Protocol for Equipment Leak Emission Estimates* states:

> *For example, in most cases,* ***SOCMI emission factors and correlations are applicable for estimating equipment leak emissions from the polymer and resin manufacturing industry.*** *This is because, in general, these two industries have*

[67] Exhibit 26, TCEQ, Air Permit Technical Guidance for Chemical Sources: Equipment Leak Fugitives (Draft October 2000), at 4 of 55.

comparable process design and comparable process operation, they use the same types of equipment, and they tend to use similar feedstock.[68]

The coal gasification industry is not similar to polymer or resin manufacturing industries (which for example make plastics, glues, fiberglass backing material, fiber optics components, and many other physical materials, not part of energy production industries), either in terms of types of equipment or similar feedstock. Rather, as stated above, coal gasification plants are more similar to oil refineries with regards to these factors and thus gas streams.

Finally, the Applicant and KDAQ selected the SOCMI without ethylene factors without providing an evaluation of the higher SOCMI average emissions factors. The particular SOCMI factors chosen by the applicant are conveniently the lowest possible emissions factors provided by SOCMI (other than SOCMI factors for non-leakers). No mention was made in the February 19th letter or KDAQ's Statement of Basis of the existence of other SOCMI emissions factors (such as SOCMI average factors), which are also much higher than the SOCMI emission factors without ethylene.

In sum, the Applicant and KDAQ have failed to establish that industry-wide synthetic chemical plant emission factors are appropriate for use in estimating fugitive leak emissions for the proposed coal gasification facility.

iii. Unsupported process stream compositions.

Neither Cash Creek nor KDAQ provided any basis or technical background regarding the percentages or types of different chemicals in each process stream used in fugitive equipment leak emission calculations. Some of the streams identified in the Applicant's submission are characterized with very low VOC content, or very low percentages of other key pollutants. Use of higher percentages of non-methane hydrocarbons in these process streams would have resulted in higher VOC fugitive leak emissions. For example, although the Applicant lists a significantly larger number of fugitive components than the similar Kentucky NewGas (KNG) facility, Cash Creek estimates lower uncontrolled and controlled fugitive VOC emissions.[69] The record does not explain or otherwise support this discrepancy. Likewise, no basis was provided

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[68] Exhibit 27, U.S. EPA, *Protocol for Equipment Leak Emission Estimates*, November 1995 ("EPA Leak Protocol"), at 2-6 (emphasis added).
[69] Compare Exhibit 22, February 19th Fugitive Leak Letter, at 3-15 of 15 and Exhibit 28, Kentucky NewGas PDF/Title V Air Permit Application, Tables C-24 to C-27.

for the percentage of H_2S and other key chemicals characterizing the process streams. As set forth above, the coal-gasification facility is likely to have process streams similar to those at a refinery, which is inconsistent with the alleged process stream compositions identified by the Applicant.

Furthermore, no basis was provided for limiting the chemicals identified in the process streams to only certain chemicals identified. The February 19th Cash Creek letter calculations identify only H_2O (water), CO_2 (carbon dioxide), H_2S (hydrogen sulfide), COS (carbonyl sulfide), H_2 (hydrogen), CO (carbon monoxide), N_2 (nitrogen), AR (argon), NH_3 (ammonia), CH_4 (methane), C_3H_8 (propane), and CH_3OH (methanol) in the process streams that cause fugitive emissions. The application for the KNG facility identifies many additional compounds present in process streams causing fugitive emissions, including carbon disulfide (CS_2), "trace quantities of various organic (i.e., benzene, toluene, naphthalene etc.)," "metallic (i.e., mercury, chromium, manganese, etc.) HAPs", hexane (which is both a HAP and a VOC), hydrogen chloride, SO_2, RDS (Reduced Sulfur Compounds), and TRS (Total Reduced Sulfur), and also hydrogen cyanide, naphthalene, phenol, formaldehyde, ethelbenzene, and xylenes.[70] The KNG Application also provides a discussion about where the process stream constituency was obtained -- from manufacturer and test information. No such information was provided for the proposed Cash Creek facility, rendering the gas stream composition unsupported.

iv. Omission of high-emission components.

The fugitive leak estimates also are in error because they completely fail to account for components where control of leaks is non-existent, limited, or delayed. In determining the control rate for the components, the Applicant and KDAQ assumed exceedingly high levels of control associated with a proposed leak detection and repair ("LDAR") program. The fugitive leak emission estimates do not account for any non-accessible, difficult-to-monitor, or unsafe-to-monitor components. Rather, the calculations assume control efficiencies ranging from 85 percent to 97 percent for all reported components, with the exception of pumps in Selexol service (heavy rich liquid) at the AGR (for which no control is assumed). In other words, there are no uncontrolled or lesser-controlled components other than the pumps in Selexol service. By their nature, however, non-accessible, difficult-to-monitor and unsafe-to-monitor components will not

[70] Exhibit 29, Kentucky NewGas PSD/Title V Air Permit Application, at 3-19 to 3-20.

be controlled at the same level as the reported components and in some cases should not be considered controlled at all, as control efficiency for leaking components is a direct result of the monitoring and repair program. Based on experience at other similar facilities, the Cash Creek facility will include some non-accessible, difficult-to-monitor, and unsafe-to-monitor components. No attempt was made to estimate and include the impact of such components on fugitive leak emission estimates. Due to omission of these components and the associated emissions, the fugitive equipment leak emissions numbers relied upon by KDAQ are underestimates.

In addition, the Permit provides a process where delay of leak repair is allowed, and multiple leaks are allowed, and no Permit limit is set which would limit the mass emissions from delay of repair. Moreover, because of the permissive language in the permit provision, "the Division Regional Office shall be notified and *may* require early unit shutdown..."[71], there is essentially no limit on fugitive emissions from delay of repair of leaking components. Such potentially unlimited emissions are not accounted for in the fugitive leak calculations.

v. Inadequate permit conditions.

The inadequacies and omissions in the fugitive leak emission calculations are perpetuated and left uncorrected by the Permit itself, which lacks enforceable terms to ensure that the proposed facility actually is a minor source. The gaps in the Permit include the following:

- *Stream composition.* The permit provisions for fugitives do not address the gaps and uncertainties in the gas stream assumptions, because no monitoring program or process sampling is required in order to confirm the low percentages of individual compounds in the gas and liquid process streams.
- *Emission factors and control efficiencies.* The Permit also lacks necessary limits and monitoring programs to confirm the emission factor and control efficiency assumptions used by the Applicant, instead relying on calculations of emissions that circularly employ the very same factors to supposedly demonstrate compliance. In other words, the permit does not include any limits or monitoring program to ensure that mass emissions from leaks will not actually exceed those based on the SOCMI without ethylene factors. In its evaluation of emission factor usage, EPA not only identified problems with using inappropriate emissions factors in permit decisions, but also identified more specific methods for developing data where industry-specific factors are unavailable. For example, EPA's *Protocol for Equipment Leak Emission Estimates* identified direct

[71] Exhibit 1, Permit at 63 of 101, Cond. 4(i).

measurement methods (bagging) for determining mass emissions.[72] The Permit fails to require such bagging techniques to develop source-specific emission factors for use in ensuring that actual emissions stay below the levels assumed in the Applicant's calculations. Nor does the permit evaluate optical sensing techniques for comprehensively identifying leaks.

- *Unenforceable source-wide limits on VOCs and H_2S.* As described above, the Permit relies on two source-wide emission limits, one for VOCs and one for H_2S, with equations as supposed compliance demonstrations. The equations rely on the same assumptions used to estimate emissions in the first instance, including the unsupported and non-source specific emission factors. U.S. EPA has clarified that such circular demonstrations are not enforceable limits on PTE.[73]

c. KDAQ Omitted Numerous Control Options and Relied on a Faulty Cost-Effectiveness Analysis in Selecting CO BACT for Fugitive Equipment Leaks.

In the supposed BACT analysis for CO from fugitive equipment leaks, the Applicant and KDAQ cut corners, resulting in a failure to consider numerous control options for leaks and an incomplete cost-effectiveness analysis.

The CO BACT analysis is based on a survey of "fugitive equipment leak control options and emission rates either permitted or presented in permit applications for recent" syngas, integrated gasification combined cycle ("IGCC"), and coal to liquids ("CTL") projects in the U.S.[74] This survey identified several general control options, including (a) routing emissions associated with pressure releases from PRVs to a control device, (b) utilizing leakless components, (c) various LDAR programs, (d) an audio/visual/olfactory ("AVO") monitoring program for odorous compounds with intensive-directed maintenance, (e) area monitors with intensive-directed maintenance, and (f) good work practices.[75] The Applicant and KDAQ rejected use of 100 percent leakless components as economically and technically infeasible, and an AVO monitoring program as technically infeasible as a control option for CO (which is odorless). After eliminating these two options, the Applicant and KDAQ cited a single TCEQ guidance document on equipment leak fugitives and selected a "MACT Equivalent LDAR

[72] *See generally* Exhibit 27, EPA Leak Protocol.

[73] Exhibit 13, BP Title V Order, at 6-7; *see also* Exhibit 30, Letter from Pamela Blakley, Chief, Air Permits Section, U.S. EPA Region 5, to Matt Stuckey, Chief, Permits Branch, Indiana Department of Environmental Management, March 19, 2010 ("Blakley Letter") at 2 (stating with regards to a similar compliance equation that "This condition is not a legally or practically enforceable prohibition on flaring emissions during periods of start-up, shut-down, and malfunction.")

[74] Exhibit 22, February 19th Fugitive Leak Letter, at "1.0 BACT Evaluation for Equipment Leak Components – Gasification Process."

[75] *Id.* at 3 of 5.

Program" with PRVs routed to control devices as BACT without citing any additional supporting information other than "Good Engineering Judgment" (as the basis for the control effectiveness for good work practices). This CO BACT analysis for fugitive leaks is flawed in several respects, as set forth below.

First, it unreasonably narrows the universe of sources to syngas, IGCC and CTL facilities, completely overlooking chemical plants and refineries. This omission is particularly ironic given that the Applicant used emission factors developed from chemical plant data for its emission calculations. Chemical plants and refineries provide control options for fugitive equipment leaks beyond those considered in the present analysis, especially more stringent LDAR programs. A proper BACT analysis should consider technologies that are transferable from other similar **sources.**[76] As control options used at chemical plants and refineries are transferable to the present source, the BACT analysis is incomplete.

More stringent LDAR programs than the one adopted by Cash Creek are evidenced from several sources. First, U.S. EPA has been requiring enhanced LDAR at chemical plants and refineries since the early 2000s.[77] These programs go beyond the LDAR program in the Permit. Second, the Bay Area Air Quality Management District ("BAAQMD") includes a 100 ppm leak standard for fugitives components for oil refineries and chemical plants in its Regulation 8 (Organic Compounds) Rule 18 (Equipment Leaks), Standard 8-18-302 (valves) and 8-18-304 (connectors); furthermore, these regulations require that any leaks found be minimized in 24 hours and repaired in 7 days.[78] This is a regulation for existing equipment (not new facilities), so BACT here must be at least if not more stringent. Both the Cash Creek Permit and the BAAQMD Permit use the same analyzer method (Method 21 of 40 CFR 60) and both are measuring the same gases, so the additional provisions in BAAQMD Rule 8-18 are feasible and relevant. The BAAQMD rule has additional quality control requirements for monitoring, including test methods for control efficiency not present in the Cash Creek Permit.[79]

[76] Exhibit 23, NSR Manual at B.11.
[77] *See* Exhibit 31, "Prepare to Clamp Down Tighter On Leaks," Chemicalprocessing.com; *see also, e.g.*, Exhibit 32, *United States v. INEOS ABS (USA) Corp.*, 1:09-cv-00545-SAS, Consent Decree (July 30, 2009, S.D. Oh.) ("INEOS CD") and Exhibit 33, *United States v. Vertellus Agriculture & Nutrition Specialties LLC*, 1:09-cv-01030-SEB-TAB, Consent Decree (filed August 21, 2009, S.D. Ind.) ("Vertellus CD").
[78] Exhibit 34, BAAQMD, Regulation 8, Rule 18, Equipment Leaks.
[79] The Cash Creek permit lists "none" for test requirements in Section B Fugitive Equipment Leaks, *see* Exhibit 1, Permit at 61 of 101, Cond. 3.

BAAQMD Regulation 8, Rule 18 also includes other more stringent provisions in its LDAR program compared to that required by the Cash Creek Permit. For example, the Cash Creek Permit requires a "first attempt" at repair within 5 days for valves, connectors, pumps, and compressors, but the BAAQMD has a specific repair time (not an attempted repair). Also, the BAAQMD program requires re-inspection within 24 hours of equipment repair or replacement (Cash Creek permit requirement is 15 days for re-inspection). The BAAQMD rule bans liquid leaks since they can cause high emissions (the Cash Creek permit only requires they be repaired), it requires visual inspection every day (Cash Creek only weekly), it includes a 500 ppm leak standard for Pressure Relief Devices, pumps, and compressors (with 15 day repair, or 7 day repair if an inspector finds the leak first). Cash Creek has a 2000 ppm standard for pump and compressor leaks, and apparently none for Pressure Relief Devices. The BAAQMD rule has a limit on mass emissions for major non-repairable leaks of 15 lbs/day. In addition, the South Coast Air Quality Management District LDAR standards, monitoring, and monitoring quality control provisions similarly require more stringent controls than the Cash Creek permit.[80] For these reasons, the BACT analysis failed to consider more effective LDAR programs, even while recognizing that "the control effectiveness offered by LDAR programs depends on the component monitored, the leak detection threshold specified for the program, the instrument monitoring frequency for the program, and the timeframe for repair requirements."[81]

Second, the cost-effectiveness analysis used to eliminate leakless components contains several errors. With regards to leakless components, KDAQ concluded that:

> As shown in Table 4-4, none of the facilities surveyed used leakless technology. Kentucky NewGas conducted a cost analysis showing that the control cost for all leakless components would exceed $20,000 per ton of CO removed, based on an uncontrolled CO emissions of 98.7 tons/yr with a component count of 13,836. Comparison of Cash Creek Generation Station (46.04 tons/yr and 19,619 component count) with Kentucky NewGas shows that the cost per ton removed will be equal to or greater than $20,000 per ton. At a cost of $20,000 per ton of CO removed this technology is considered infeasible.[82]

[80] Exhibit 35, SCAQMD, Rule 1173, Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants.
[81] Exhibit 22, February 19th Fugitive Leak Letter, at page 4 of 5.
[82] Exhibit 20, March 2010 SOB at 31.

These statements begin from the faulty premise that consideration of leakless components in the BACT analysis consists only of a facility design employing *entirely* leakless components. To the contrary, facilities in other contexts have considered and employed leakless and/or certified low leak components (Cash Creek omits the latter entirely from its BACT analysis) for a significant portion of their total component count. U.S. EPA has required consideration/use of some leakless and/or certified low leak components in its consent decrees covering similar facilities.[83] There is no evidence that Cash Creek or KDAQ considered a control option consisting of less than all leakless components.

Using leakless and/or certified low leak components for a targeted portion of the components, particularly for non-accessible or unsafe/difficult-to-monitor components where emissions may be significantly higher than at other components due to the lack of/limited control from an LDAR program, is completely ignored by Cash Creek and KDAQ. Such an option would address both the alleged safety concerns noted by Cash Creek, as the components could be required only at locations with lower risk. Moreover, such an option would significantly reduce the cost of using leakless components assumed in the Kentucky NewGas application, which likewise was based solely on using all leakless components. For these reasons, the BACT analysis is incomplete due to its exclusion of an available control option – use of targeted leakless or certified low leak components.

Additionally, KDAQ and Cash Creek erred by failing to conduct an average cost-effectiveness analysis before concluding that use of all leakless components is infeasible. Cost considerations in determining BACT are expressed in one of two ways: average cost effectiveness or incremental cost effectiveness. Incremental cost effectiveness is an optional consideration that must always be paired with average cost effectiveness.[84] The *NSR Manual* warns that "undue focus on incremental cost effectiveness can give an impression that the cost of a control alternative is unreasonably high, when, in fact, the total cost effectiveness, in terms of dollars per total ton removed, is well within the normal range of acceptable BACT costs."[85] Incremental cost effectiveness is the difference in total annual costs between two contiguous

[83] *See* Exhibit 32, INEOS CD; Exhibit 33, Vertellus CD.
[84] Exhibit 23, *NSR Manual* at B.41 ("incremental cost effectiveness should be examined in combination with the total cost effectiveness in order to justify elimination of a control option."), B.43 ("As a precaution, differences in incremental cost among dominant alternatives cannot be used by itself to argue one dominant alternative is preferred to another.").
[85] *Id.* at B.45 to B.46.

control options that are on the dominant control curve.[86] The consideration of incremental cost effectiveness is not to be used to reject an option merely because it costs more—even if it costs twice as much—as the next dominant alternative.[87]

Here, Cash Creek and KDAQ rejected use of all leakless components as a control option based solely on an estimate of incremental cost-effectiveness from the Kentucky NewGas facility. Beyond the fact neither Cash Creek nor KDAQ conducted *any* actual cost analysis for Cash Creek, DAQ failed to conduct a proper cost-effectiveness analysis because it failed to calculate average cost effectiveness and instead relied wholly on incremental cost effectiveness. This incremental-cost-effectiveness-only approach is legally inadequate.

VI. THE NEW UNIT WILL BE A MAJOR SOURCE OF HAZARDOUS AIR POLLUTANTS.

The Administrator must object because the Permit continues to lack appropriate case-by-case MACT determinations for HAPs, instead relying on an erroneous minor source determination. HAPs are regulated under Section 112 of the Clean Air Act. 42 U.S.C. § 7412. The purpose of the Clean Air Act's HAPs program is to force the stringent control of these highly detrimental pollutants because they could "cause, or contribute to, an increase in mortality or an increase in serious irreversible[] or incapacitating reversible[] illness." *New Jersey v. EPA*, 517 F.3d 574, 577 (D.C. Cir. 2008) (quoting legislative history of Section 112). Due to the importance of controlling HAPs, it is crucial that sources accurately identify HAP emissions. If, as here, a source feigns its way into the minor source category and thereby illegally circumvents the requirement for stringent controls, it defeats the purpose of the MACT program. The above sections on active flaring emissions and equipment leaks outline numerous ways in which the Applicant and KDAQ underestimated HAP PTE. The Administrator must object and require a full reanalysis of whether the proposed facility will be a major source of HAPs.

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[86] *Id.*
[87] *Id.* at B.43.

VII. FAILURE TO ACCURATELY ESTIMATE, SUFFICIENTLY CONTROL AND ADEQUATELY MODEL PM FROM MATERIAL HANDLING.

The Administrator must object because the Applicant and KDAQ failed to ensure that the proposed plant will not violate the PM_{10} and $PM_{2.5}$ NAAQS, due to a failure to estimate and model the full material handling emissions allowed under the Permit.[88] Among the "applicable requirements" with which a Title V permit must ensure compliance are 42 U.S.C. § 7475(a)(3), 401 51.17, sec. 8, 401 KAR 52.020, sec. 1(3), (21), 401 KAR 53:005, sec. 1(3), and the NAAQS. Each of these provisions prohibits emissions that would cause and/or contribute to a violation of ambient air quality standards. The Applicant and KDAQ conducted a preliminary analysis for PM_{10} and $PM_{2.5}$, stopping short of the required full NAAQS and PSD increment modeling. However, the Applicant's PM_{10} and $PM_{2.5}$ impact analyses include numerous calculation and modeling errors, resulting in underestimated project emissions and thus ambient air quality impacts. The crux of the PM modeling errors is an overall failure to establish that the control measures in the Permit will result in the level of control assumed in the emission calculations, whose results were then modeled for air quality impact purposes. These errors are key with respect to PM air quality impacts, as material handling emissions can be the major contributor to maximum PM_{10} and $PM_{2.5}$ impacts.

Correcting the errors and omissions shows that a full NAAQS and PSD increment modeling analysis should have been conducted for both PM_{10} and $PM_{2.5}$. The Applicant and KDAQ must go back and make the corrections, gather the legally mandated preconstruction monitoring data, see 42 U.S.C. § 7475(a)(7) and (e)(2), *see also U.S. v. Louisiana-Pacific Corp.*, 682 F.Supp. 1141, 1146 (D. Colo. 1988), conduct full NAAQS and PSD increment modeling, and subject the revised modeling demonstration to public comment.

a. The Applicant and KDAQ relied on unreasonably high and unsupported control efficiencies for the paved and unpaved roads.

As a general matter, the permit record fails to link the assumed control efficiencies for material handling operations (unpaved roads, paved roads, coal and slag piles) to the control measures listed in the Permit. Merely describing measures in narrative form does not support that these measures together can achieve the specific control efficiency or efficiencies assumed for

[88] KDAQ is required to ensure protection of the $PM_{2.5}$ NAAQS independently from the PM_{10} NAAQS.

purposes of calculating emissions and modeling air impacts. KDAQ must list the control efficiency associated with each measure and support the aggregate control efficiency as well, citing to sources for the control efficiencies. It did not do so.

Fugitive PM_{10} emissions from unpaved and paved roads, as well as coal and slag piles, are underestimated significantly based on the unsupported assumption of 90 percent dust control efficiency from various vague, narrative mitigation measures.[89] Petitioners in their comments noted numerous shortcomings in the control efficiency assumptions and cited several sources on dust emissions from unpaved roads, paved roads and coal and slag piles that contradict the assumed 90 percent control.[90] Based on these sources, Petitioners recalculated onsite unpaved road dust fugitive PM_{10} emissions assuming 75 percent controls, which is most likely an over-estimation of achievable fugitive dust control on the Proposed Plant's unpaved roads. The correction from 90 percent assumed control efficiency to a more realistic 75 percent control increased the unpaved road dust fugitive PM_{10} emissions by a factor of 2.5. Petitioners also recalculated onsite paved road dust fugitive PM_{10} emissions, again using a more realistic 75 percent control, with the same resulting factor of increase in paved road fugitive dust emissions, and coal and slag piles using a 60 percent control efficiency.

In response to these comments, KDAQ merely states (for example with respect to unpaved roads) as follows:

> During arid time periods between qualifying rainfall events, the average 90 percent control efficiency was determined using a combination of the following mitigating methods listed in Section B of the Permit, Operating Limitations a(1), a(4) and b:
>
> 1. Wet suppression by source;
> 2. Use of silt fences;
> 3. Use of gravel; and
> 4. Speed restrictions of 20 miles per hour.[91]

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[89] Exhibit 36, Prevention of Significant Deterioration, Title V Operating Permit & Phase II Acid Rain Joint Application for Cash Creek Generating Station, Henderson County, KY, December 2009 ("December 2009 Application"), at 5-28.

[90] Exhibit 3, January 14th Comments, at 49-54 (*citing* Exhibit 37, U.S. EPA, Control of Open Fugitive Dust Sources, EPA-450/3-88-008, September 1988; Exhibit 38, Howard Hesketh and Frank Cross, Fugitive Emissions and Controls, Ann Arbor Science, 1983; Exhibit 39, Excerpt from South Coast Air Quality Management District, CEQA Air Quality Handbook, April 1993; Exhibit 40, Western Governor's Association, WRAP Fugitive Dust handbook, November 15, 2004; and Exhibit 41, U.S. EPA, Office of Air Quality Planning and Standards, AP-42, Section 13.2.1, Paved Roads, November 2006 ("AP-42 for Paved Roads")).

[91] Exhibit 12, RTC, at B-20 to B-21; B-23 (paved road response regarding 90 percent control, noting addition of chemical suppression as a mitigating control)

This response is wholly inadequate. It does not cite any studies, reports or analyses supporting any individual or collective control efficiency from the listed measures. Thus, the worst-case allowed emissions for unpaved roads, paved roads, and coal and slag piles are significantly underestimated.

In addition, the Petitioners commented on the Applicant's use of an inappropriate rainfall correction factor for calculating 24-hour PM_{10} emission rates from unpaved roads, paved roads, and storage piles. The Applicant only calculated annual-average PM_{10} emissions, and used an emission reduction factor based on the number of days of rain per year. This strategy is not applicable to short-term emission rate calculations where rainfall during the averaging period should not be considered. For example, it may not rain for many days in a row, thus rainfall will not be a mitigating factor when calculating 24-hour PM_{10} emission rates during that dry period. In essence, the Applicant inappropriately applied annual-average rainfall-reduced PM_{10} emission rate calculations to 24-hour PM_{10} emissions. The Applicant applied a correction factor of ((365-125)/365) to their 24-hour PM_{10} emissions, where 125 is the number of days per year with rainfall greater than or equal to 0.01 inch.[92] Removing this incorrect emission reduction to 24-hour PM_{10} emissions increases the calculated emission from all three sources by a significant factor. The Applicant's use of this rainfall correction factor is contrary to the very document on which it relied, i.e., U.S. EPA's AP-42 for Unpaved Roads. AP-42 does not endorse the use of this annual averaging equation for short term purposes, and in fact says the opposite. AP-42 says:

> The effect of routine watering to control emissions from unpaved roads is discussed below in Section 13.2.2.3, "Controls". However, all roads are subject to some natural mitigation because of rainfall and other precipitation. *The Equation 1a and 1b emission factors can be extrapolated to annual average uncontrolled conditions* (but including natural mitigation) under the simplifying assumption that annual average emissions are inversely proportional to the number of days with measurable (more than 0.254 mm [0.01 inch]) precipitation:
>
> $$\mathbf{E_{ext} = E\ [(365 - P)/365]}$$
>
> . . . Equation 2 provides an estimate that *accounts for precipitation on an annual average basis for the purpose of inventorying emissions. It should be noted that Equation 2 does not account for differences in the temporal distributions of the rain events*, the quantity of rain during any event, or the potential for the rain to evaporate from the road surface.

[92] Exhibit 36, December 2009 Application, at 5-26 to 5-28.

> *. . . It is emphasized that the simple assumption underlying Equation 2 and the more complex set of assumptions underlying the use of the procedure which produces a finer temporal and spatial resolution have not been verified in any rigorous manner.*[93]

Thus, the rainfall correction equation from AP-42 can only be used to provide a PM_{10} estimate "that accounts for precipitation on an annual average basis"; the equation cannot be used to generate short-term averages of PM_{10} emissions, much less to calculate an hourly or daily maximum. Here, however, Cash Creek did precisely that: the PM_{10} emissions estimates for unpaved roads, paved roads and coal and slag piles include lbs/hr and lbs/day maxima that inappropriately incorporates this AP-42 rainfall equation. In sum, Applicant's daily and hourly emission estimates must be recalculated without the use of any rainfall correction factor.

b. The Applicant and KDAQ relied on an unreasonably low and unsupported silt loading factor for paved roads.

The PM emissions and modeling also are based on an unreasonably low and unsupported silt loading factor that does not reflect conditions at the proposed facility. Silt loading is a critical assumption in estimating PM emissions from roads, as the PM emissions vary directly with the silt content. Here, the Applicant and KDAQ failed to link the specific facility roads and their uses to the assumed silt loading factor. As a result, they failed to establish that the extremely low 0.4 g/m^2 assumed value reflects the worst-case silt conditions allowed under the Permit for purposes of estimating PM emissions from paved roads and modeling the impact of these emissions.

The Applicant and KDAQ erred in the first instance by failing to obtain, or even look for, site-specific silt data from similar sources. AP-42 specifically states that the use of a tabulated default value for silt loading results in only an order-of-magnitude estimate of the emission factor for fugitive dust from truck traffic on paved roads and, therefore, highly recommends the collection and use of site-specific silt loading data.[94] There is no evidence in the record that either Cash Creek or KDAQ attempted to ascertain silt loading data from a similar existing source. Instead, they relied on theoretical and unsupported statements about uses, and conclude without citing any evidence that these factors will "help maintain the silt loading at low levels."[95]

[93] Exhibit 42, AP-42 Chapter 13.2.2 Unpaved Roads, at 13.2.2-6 and 13.2.2-7 (emphasis added).
[94] Exhibit 41, AP-42 for Paved Roads, at 13.2.1-6.
[95] Exhibit 12, RTC, at B-22.

This approach is insufficient. As U.S. EPA states, "[a]ll emissions estimates must be from similar sources equipped with similar control equipment and operating at similar process/control equipment parameter rates."[96] There is no evidence in the record that the statements regarding road usage equate to 0.4 g/m^2 based on other similar sources.

Where a source cannot obtain site-specific data (assuming for argument's sake that Cash Creek or KDAQ had made any effort to do so but had failed), AP-42 recommends the selection of an appropriate mean value from a table listing silt loadings that were experimentally determined for a variety of industrial roads. The Applicant and KDAQ erred in several ways in selecting a value from the AP-42 industrial paved road table, as set forth below.

The AP-42 values represent average values. In permitting, a source is required to estimate the maximum Potential to Emit from the specific source, and to model worst case emissions to ensure protection of the NAAQS. Given these requirements, the use of average values for material handling purposes here is inappropriate. U.S. EPA has voiced this caution with regards to applicability, stating that "AP-42 emissions factors represent an average range of emissions rates for a source category and are not precise enough for regulatory applicability determination."[97] The Applicant and KDAQ did not adjust for this factor. U.S. EPA also cautions that use of the table values for silt instead of site-specific values decreases the quality rating of the paved road equation by 2 levels.[98] The Applicant and KDAQ failed entirely to account for the reduction in quality rating of the equation due to use of the non-facility specific values.

U.S. EPA furthermore recommends using the maximum of the range of reported values in this context.[99] Rather than heed this guidance, KDAQ selected a silt value, 0.4 g/m^2, that is at the very low end of the reported range for the industry chosen from the industrial paved road silt table (0.09 to 79 g/m^2). Nowhere does KDAQ explain why the *worst-case* silt conditions at the proposed facility are more consistent with the low end of this range than with the average or the high end. The industrial roadway table provides a range of mean silt loading values from 7.4 to 292 g/m^2.[100] At the very least, given the requirement to estimate PTE and model worst case

[96] Exhibit 43, U.S. EPA, Appendix D Preliminary Emissions Factors Program Improvement Option Paper 4 Providing Guidance Regarding the Use of Emissions Factors for Purposes Other than Emissions Inventories ("EPA EF Option Paper 4")
[97] *Id.*, at 4-3, Table 4.1
[98] Exhibit 41, AP-42 Paved Roads, at 13.2.1.-6.
[99] *See* Exhibit 43, EPA EF Option Paper 4, at 4-11, Table 4-4, "Future Uses of Emissions Factors."
[100] Exhibit 41, AP-42 Paved Roads, at Table 13.2.1-4.

emissions, the Applicant and KDAQ should have chosen a value representing the mean for the industry chosen, or 7.4% silt (increasing the PM emissions by almost seven times).

In selecting the allegedly-similar industry and value within that industry's reported range, the Applicant and KDAQ also failed to explain why the iron and steel industry is the most analogous industry for the paved roads at the Cash Creek facility. The Cash Creek facility will handle significant amounts of coal. This handling of a dry substance has the potential to impact the silt values on the paved roads, even where the paved roads themselves are limited to transport of gasifier slag, due to carryover from other operations (such as by wind). The choice of a very low value from the iron and steel industry does not account for this additional factor impacting silt at the Cash Creek facility.

Finally, the permit fails to contain terms and conditions that limit the silt on the paved roads on a continuous basis to the 0.4 g/m^2 assumed in the calculations. KDAQ is only requiring weekly visual inspections of the paved roads, which will do nothing to ensure that Cash Creek is keeping the facility's paved road silt loading to such a low number.

c. Remodeled PM Emissions Exceed the Significant Impact Levels Used by KDAQ to Avoid a Full Cumulative PM Air Impact Assessment.

Petitioners remodeled the PM_{10} and $PM_{2.5}$ impacts, based on the corrections to material handling estimates noted above and described in their comments.[101] This modeling shows exceedances of the PM significant impacts levels ("SILs") used by KDAQ as a screening threshold. As such, KDAQ and the Applicant should be required to go back and remodel the PM impacts using correct emission estimates reflecting worst-case allowable emissions under the Permit's terms and conditions, collect the required onsite preconstruction monitoring data, and include all required sources in full NAAQS and PSD increment ambient air quality analyses.

[101] Exhibit 3, January 14th Comments, at 49-62; Exhibit 44, modeling file titled "met"; Exhibit 45, modeling file title "pm10"; and Exhibit 46, modeling file titled "pm2.5."

d. The Permit contains unenforceably vague terms and conditions for material handling that do not equate to the control efficiencies assumed in the emission estimates and modeling.

The material handling measures listed in the Permit are unenforceably vague and therefore do not constitute proper limitations on potential to emit from material handling sources sufficient to assume an exceedingly high assumed percent control. As put forth above, to be enforceable, a permit must create mandatory obligations that provide a clear explanation of how the actual limitation or requirement applies to the facility and make it possible for KDAQ, U.S. EPA, and citizens to determine whether the facility is complying with the condition. U.S. EPA has made clear that vague and/or ambiguous permit language is not enforceable:

Many Title V permits contain ambiguous phrases, such as "if necessary" For example: "If necessary, the permittee shall maintain monthly records..." The phrase "if necessary" should be removed altogether; the permit should specify exactly what is necessary. In this example, the permit should either precisely explain the situation that would necessitate monthly records, or simply require monthly records at all times. Ambiguous language hampers the source in its duty to independently assure compliance, and leaves legal requirements open to interpretation.[102]

Particular sources of vagueness in the present Permit include failures to:

- specify the frequency with which wet suppression must be applied;
- specify the atmospheric and operational conditions under which wet suppression must be applied;
- specify how to determine when to use chemical suppression alone, wet suppression alone, or chemical suppression in combination with wet suppression;
- describe in enforceable terms how to determine when a measure is "applicable";
- describe in enforceable terms how a chemical is deemed "suitable";
- describe in enforceable terms what "other surfaces" are encompassed by that term;
- describe in enforceable terms how to determine whether to apply water sprays or "other measures";
- describe in enforceable terms what "other measures" must be used to suppress dust emissions during handling; and
- describe in enforceable terms what constitutes a "clean condition" and "prompt" removal.[103]

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[102] Exhibit 47, Letter from Bharat Mathur, EPA Region 5, to Robert F. Hodanbosi, Ohio EPA, November 21, 2001.
[103] *See* Exhibit 1, Permit, at 75-76 (listing operation limitations for paved and unpaved roads, as well as coal and slap storage piles).

The Permit terms and conditions as written are not enforceable, nor do they ensure the exceptionally high control efficiencies assumed in the PM modeling. For these reasons, the Administrator must object.

VIII. THE OZONE ANALYSIS FAILS TO DEMONSTRATE THAT THE PROPOSED FACILITY WILL NOT CAUSE OR CONTRIBUTE TO VIOLATIONS OF THE OZONE NAAQS.

The Administrator must object because the Applicant and KDAQ have failed to show that the proposed source will not cause or contribute to violations of ozone air quality standards. Even under KDAQ's incomplete assessment of emissions, the proposed Cash Creek facility will emit large amounts of NO_x (179 tpy) and VOC (29 tpy). These ozone precursors react under sunlight to form ozone, a harmful pollutant that attacks the respiratory system. The inappropriate qualitative assessment of ozone impacts relied on by KDAQ is insufficient to ensure protection of the ozone NAAQS. Based on regulatory requirements and due to serious concerns about ozone levels in nearby areas, the Applicant must conduct individual source modeling of ozone impacts. It must then submit these analyses to KDAQ for the agency's and the public's assessment.

a. The Applicant Failed to Conduct, and KDAQ Failed to Require, Actual Ozone Modeling.

The ozone analysis is insufficient because it relies on a dated, unapproved, non-site-specific qualitative method instead of the required source-specific modeling. In order to assess impacts to air quality, the Clean Air Act requires applicants and agencies to use modeling. *See* 42 U.S.C. 7475(e)(3)(D) (requiring the Administrator to promulgate regulations specifying "each air quality model or models *to be used* for purposes" (emphasis added) of the PSD program, specifically the ambient air quality demonstration).[104] Kentucky regulations echo this requirement. 401 KAR 51:017 Section 10 ("Air Quality Models. (1) Estimates of ambient concentrations *shall be based on the applicable air quality models*, data bases, and other

[104] *See also* Exhibit 23, NSR Manual at C.24 ("Dispersion models are the primary tools used in the air quality analysis. These models estimate the ambient concentrations that will result from the PSD applicant's proposed emissions in combination with emissions from existing sources. The estimated total concentrations are used to demonstrate compliance with any applicable NAAQS or PSD increments. The applicant should consult with the permitting agency to determine the particular requirements for the modeling analysis to assure acceptability of any air quality modeling technique(s) used to perform the air quality analysis contained in the PSD application.")

requirements specified in 40 C.F.R. Part 51, Appendix W, 'Guideline on Air Quality Models' (2003), Appendix A.") Modeling must be conducted for each pollutant that the proposed source would emit in significant amounts. 401 KAR 51:017 Section 11(1)(a)1. U.S. EPA regulations describe the importance and baseline requirements of modeling as follows:

- "the impacts of new sources that do not yet exist can only be determined through modeling."
- "In all cases, the model applied to a given situation should be the one that provides the most accurate representation of atmospheric transport, dispersion, and chemical transformations in the area of interest."
- "...to ensure consistency, deviations from this guide should be carefully documented and fully supported," and "consistency is not [to be] promoted at the expense of model and data base accuracy."

40 C.F.R. Part 51 Appendix W Subsections 1.b to 1.e. States and applicants are not to undertake their own independent adjustments of modeling approaches, but must seek federal approval of deviations from federal regulatory guidelines. 42 U.S.C. § 7475(e)(3)(D).[105] In sum, modeling (a) is imperative for new sources, (b) must be accurate, up-to-date, and site-specific to the greatest degree possible, and (c) must fully justify any deviations from the federal guidance and receive federal approval of any alternative modeling approach.

Neither the Applicant nor KDAQ conducted any source-specific individual source modeling to demonstrate compliance with ozone ambient air quality standards.[106] The Applicant cites Subsection 5.2.1c, entitled "Estimating the Impact of Individual Sources," as support for its

[105] "Any model or models designated under such regulations may be adjusted upon a determination, after notice and opportunity for public hearing, by the Administrator that such adjustment is necessary to take into account unique terrain or meteorological characteristics of an area potentially affected by emissions from a source applying for a permit required under this part." *See also* 401 KAR 51:017 Section 10: "(2) If an air quality model specified in 40 C.F.R. Part 51, Appendix W, is inappropriate, the model may be modified or another model substituted. (a) The use of a modified or substitute model shall be:

1. Subject to notice and opportunity for public comment under 401 KAR 52:100; and
2. Made on a *case-by-case basis* and *receive written approval from the U.S. EPA*." (emphasis added); Appendix W at 3.2.2 (giving Regional Offices responsibility for determining the acceptability of alternative models, and proscribing specific criteria for approval by the Regional Administrator).

[106] Exhibit 48, December 2009 SOB at 46 ("The ozone air quality ambient impact analysis is qualitative in nature. Estimates of increases in ozone formation were determined by scaling NOX emissions from the facility using data from modeling sensitivity studies conducted by Georgia Environmental Protection Department (EPD) in support of their 8-hr ozone SIP development.") and Exhibit 49, December 2009 Application Appendix A, at A4 ("CCGS has performed a qualitative analysis of ozone impacts from the CCGS based upon actual regional ozone modeling performed by Georgia EPD.")

use of a "qualitative" analysis using unmodified 3-year-old regional modeling from another state:

> *Choice of methods used to assess the impact of an individual source depends on the nature of the source and its emissions. Thus, model users should consult with the Regional Office to determine the most suitable approach on a case-by-case basis (subsection 3.2.2).*[107]

This citation is misleading and does not provide support for the approach taken by the Applicant and KDAQ. Nowhere does Subsection 5.2.1c exempt a source from the requirement to conduct modeling for ozone; instead, the quoted passage must be read in context to mean that a case-by-case approach should be taken for *individual source modeling methods* for ozone impacts, following the process outlined in Subsection 3.2.2. *See* Appendix W at 5.2.1 (entitled "Models for Ozone" and citing Section 3.2.2) A qualitative adaptation of modeling done years ago by another state for different purposes is not alternative modeling for an individual source.

Nor is there any evidence in the record that the Applicant and KDAQ received the required regional approval for their approach. As noted above, such approval would include a case-by-case analysis of the appropriateness of the approach, following a process proscribed by U.S. EPA regulations. *See* Appendix W at Subsection 3.2.2.[108] The only mention of Region IV approval in the record is a reference in Appendix A to a letter to the Georgia EPD dated December 2000[109], which states:

> *Although ozone impact modeling is not normally required for single sources, information on the current ozone levels in the area should be cited to provide qualitative assurance that the increased [emissions] from facility operation will not cause or contribute to violations of the ozone national ambient air quality standards.*

Reliance on this statement is inappropriate. First, the regulations require Regional approval on a case-by-case basis. It is therefore improper to rely on a determination for another facility in

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[107] Exhibit 49, December 2009 Application Appendix A, at A2.

[108] Notably, the lack of an approved model does not mean that the applicant's preferred modeling approach gets the green light. Rather, an alternative model may be used only if: "i. The model has received a scientific peer review; ii. The model can be demonstrated to be applicable to the problem on a theoretical basis; iii. The data bases which are necessary to perform the analysis are available and adequate; iv. Appropriate performance evaluations of the model have shown that the model is not biased toward underestimates; and v. A protocol on methods and procedures to be followed has been established. "Appendix W Subsection 3.2.2(e). The record does not demonstrate that these criteria have been met.

[109] Exhibit 49, December 2009 Application Appendix A at A.2 to A.3 (*citing* "Letter dated December 13, 2000, from U.S. EPA Region IV to Mr. Ron Methier, Georgia EPD"); Exhibit 48, December 2009 SOB at 46 (making no mention of regional approval).

another state that occurred many years ago. Second, the statement is nine years old and hence, as taken up below, is extremely dated with respect to modeling capabilities.

KDAQ responded to this comment with the following:

> *The Division does not concur. Actual ozone modeling is not required or technically feasible. In the absence of a regulatory model for near field ozone impacts, the Division deemed the "analytical procedure" conducted by the applicant applicable for demonstration purposes in accordance with 40 CFR Part 51 Appendix W at Subsection 3.2.2. As stated in section 5.2.1 of Appendix W, the choice of method to assess the impact of an individual source depends on the nature of the source and its emissions. In addition, 40 CFR 51 Appendix S at subsection III. C, states that "the determination as to whether a source would cause or contribute to a violation of a NAAQS should be made as of the new source's start-up date." Further, the Division does not agree that reliance on the statement as referenced in December 2009 SOB at 46 is not applicable in the absence of the promulgation of a regulatory model for single source ozone impacts.*[110]

This statement does not sufficiently address Petitioners' comments so as to justify the ozone modeling failures. First, it affirms that KDAQ did not follow the correct procedure for receiving federal agency approval. Second, KDAQ ignores that the method chosen by the applicant must be an individual source modeling method, per the regulations. Third, it omits any support for its claim that actual ozone modeling is technically feasible, relying only on the assertion that modeling is not required because there is no "regulatory model for near field ozone impacts." As discussed below, actual ozone modeling is technically feasible. Fourth, the statement implicitly claims that the choice of the qualitative method was appropriate based on the nature of the source and the source's emissions, but provides no actual supporting information demonstrating how the approach is appropriate.[111] As set forth below, several factors weigh against using the Georgia-qualitative adaptation method.

b. The Qualitative Ozone Analysis Is Inadequate to Demonstrate Protection of the Ozone NAAQS.

Moreover, even if the qualitative approach could be termed modeling, it is not suitable, as it does not "provide[ ] the most accurate representation of atmospheric transport, dispersion, and

[110] Exhibit 12, RTC, at B-106.
[111] Nor does the Statement of Basis, *see* Exhibit 20, March 2010 SOB, at 47.

chemical transformations in the area of interest." Appendix W Subsection 1.e. The Applicant and KDAQ made little to no effort to demonstrate that ozone modeling for Georgia is appropriate for Kentucky based on similarities in atmospheric transport, dispersion, and chemical transformations in the region surrounding the Proposed Plant. As U.S. EPA has noted, "the diversity of the nation's topography and climate, and variations in source configurations and operating characteristics" counsel against using the same recipe for modeling impacts from a source in one area as that used in another. *See* Appendix W Subsection 1.c. Here, significant differences exist between Kentucky and Georgia (both in terms of the topography/climate and source characteristics) that render the Georgia data inappropriate for use in this case.

The qualitative impact analysis submitted by Cash Creek is inappropriate or, at best, inadequate since it is based on the Georgia ozone modeling results that are:

1. Not valid in Kentucky due to large differences in emissions of ozone precursors (NO_x and VOC), terrain, land use, wind and other atmospheric conditions that affect ozone formation. Precursor emissions are different in terms of both source types and quantity. Recent VISTAS inventories show that NO_x and VOC emissions from onroad mobile sources in Georgia are much larger (twice for NO_x and more than 180% for VOC) than those in Kentucky.[112] Kentucky has about 33% more NO_x emissions from utility than Georgia.[113]
2. Based on reductions in non-power plant anthropogenic emissions (e.g., urban vehicular emissions), rendering the results not applicable to an elevated point source such as Cash Creek.
3. Based on reductions in NO_x reductions at existing power plants, again rendering the results inapplicable to a new power plant such as Cash Creek.
4. Focused on ozone impacts in large cities such as Atlanta while the Cash Creek facility will impact mostly rural areas.

KDAQ responded to these comments by stating as follows:

> *The Division does not concur. In the absence of a regulatory model for single source ozone impacts, the Division deemed the "analytical procedure" conducted by the applicant applicable for demonstration purposes in accordance with Appendix W at Subsection 3.2.2. Further, the qualitative procedure is conservative due to the urban areas modeled and the higher ratio of cumulative NOx to VOC emitted in Kentucky in comparison to Georgia (1:2 vs. 2:9) as determined by comparison of U. S. EPA emissions data found at the following websites:*

[112] *See* Exhibit 50, Maureen Mullen, 2003. VISTAS 2002 Draft Onroad Mobile Inventory.
[113] *See* Exhibit 51, Edward Sabo, 2003. 2002 Southeast Emissions Inventory Development.

http://www.epa.gov/air/emissions/nox.htm,
http://www.epa.gov/air/emissions/voc.htm,
ftp://ftp.epa.gov/EmisInventory/2002finalnei/biogenic_sector_data/.

Again, the agency's response is inadequate. KDAQ continues to rely on a conclusory and unsupported statement that the agency made its determination in accordance with Subsection 3.2.2. KDAQ also fails to address Petitioners' comments about differences in terrain, land use, atmospheric conditions and relative source contribution, and does not compare the significance of these impacts to the significance of the cited conservative factors. Finally, the conclusion drawn by KDAQ about deriving the relative ozone impact from the NOx to VOC ratio has been discredited.[114] The ratio could just as well go in the opposite direction, and the only way to know for sure is to run the actual models. For these reasons, KDAQ has not demonstrated that the qualitative approach provides the most accurate representation of atmospheric transport, dispersion, and chemical transformations in the area of interest.

In addition, ozone precursors emitted by proposed power plants in Kentucky have been shown to cause significantly large ozone increases. In a December 2001 modeling study by Kentucky Natural Resources and Environmental Protection Cabinet, the photochemical model CMAQ was used by the US EPA to show that new power plants in Kentucky can generate 8-hour ozone increases up to 11 ppb.[115] These large ozone increases were found to "occur in the western part of the state, close to where new power plants are proposed."[116] This cumulative study also shows that Henderson County has the second largest daily total of NO_x emissions (14.86 tpd) from new power plants.

Furthermore, ozone monitoring data in Henderson County have exceeded the 2008 AAQS of 0.075 ppm. Ozone measurements from the U.S. EPA AirData website show that the 4th maxima are 0.074 ppm for 2008, 0.083 pphm for 2007, 0.074 ppm for 2006 and 0.077 ppm for 2005.[117] Thus, the 3-year averages of these 4th 8-hour maxima 0.077 ppm for 2008-2006 and 0.078 ppm for 2007-2005. These 3-year averages are higher than the average of 0.076 ppm reported in the November 2009 Cash Creak ozone analysis. As a result of high ozone

[114] Exhibit 52, Letter from Richard D. Scheffe, Senior Science Advisor, U.S. EPA, OAQPS, to Abigail Dillen, July 28, 2006 (stamped August 3, 2006).
[115] *See* Exhibit 53, Kentucky NREPC, *A Cumulative Assessment of the Environmental Impacts Caused by Kentucky Electric Generating Units*, 2001.
[116] *Id.* at 31.
[117] Data is available at http://www.epa.gov/air/data/monsum.html?st~KY~Kentucky.

measurements, Henderson County has been proposed in March 2009 by KDAQ as in non-attainment with the 2008 AAQS of 0.075 ppm.[118] Thus, Henderson County has an ozone problem that will get worse since Cash Creek and other planned facilities will increase ozone concentrations. Moreover, U.S. EPA has recently proposed to lower the 2008 8-hour ozone standard of 0.075 ppm to between 0.06 and 0.07 ppm.

KDAQ responded to this comment by citing the stay of the 0.075 ppm ozone NAAQS and concluding that Henderson County cannot be considered non-attainment for ozone. KDAQ misses a significant point of Petitioners' comment: to highlight the ozone problem in Henderson County as it informs the need for more stringent and individualized quantitative analysis of ozone impacts. KDAQ once more fails to show that its approved approach ensures protection of the ozone NAAQS.

Moreover, since issuance of the Georgia letter in 2000, significant advances have been made in the available modeling processes for ozone impacts from individual sources. Photochemical Models such as CMAQ are available and appropriate for such analyses, in that (a) they have been peer reviewed, (b) they are applicable to individual source ozone modeling on a theoretical basis, (c) the necessary databases are available and adequate, (d) performance evaluations show they are not biased toward underestimates, and (e) a protocol on methods and procedures to be followed has been established. Appendix W Subsection 3.2.2(e). With readily available modeling databases such as the KY NREPC cumulative study and more recent modeling studies (e.g., the Kentucky ozone SIP and VISTAS regional modeling), it is fairly fast and inexpensive to perform such modeling analyses. Further, in recent years, several enhancements such as the use of fine grid resolution (4 km or less) and plume-in-grid treatment have made photochemical models like CAMx and CMAQ more suitable for predicting ozone impacts from large NO_x plumes from power plants. These models have recently been applied to large point sources such as power plants in Kansas, Missouri, Oklahoma and Texas, as summarized in a presentation by U.S. EPA staff.[119] Recently, AMI Environmental has utilized the CAMx model with a 2-km grid to assess the ozone impacts of the proposed White Stallion on

[118] *See* Exhibit 54, Letter from L.K. Peters, Secretary of Kentucky Energy and Environment Cabinet to A.S. Meiburg, Acting Regional Administrator, EPA Region 4, March 12, 2009.
[119] Exhibit 55, Snyder, Erik and Bret Anderson, 2005. *Single Source Ozone/PM2.5 in Regional Scale Modeling and Alternate Methods.*

ozone air quality in Houston.[120] An individual source analysis using these models would provide a significantly more accurate estimation of ozone impacts in the project area than does the qualitative analysis based on dated and out-of-state information. Single source modeling is especially important, given the ozone problems in Henderson County and the ozone NAAQS revision described above.

KDAQ responded to these comments with the following statements:

> *The Division does not concur. In the absence of a regulatory model for single source ozone impacts, the Division deemed the "analytical procedure" conducted by the applicant applicable for demonstration purposes in accordance with Appendix W at Subsection 3.2.2. Furthermore, without the existence of regional ozone inventories for use in a regulatory single source model for ozone, an ozone NAAQS modeling analysis for PSD purposes is inappropriate and technically infeasible.*

KDAQ's statement about the absence of a regulatory model does not address Petitioners' comments about the feasibility of conducting ozone modeling. The examples cited by Petitioners show that such modeling is feasible. In addition, Petitioners cited several sources of inventory information that KDAQ can use for the required ozone modeling. For these reasons, the Applicant and KDAQ have not ensured protection of the ozone NAAQS.

IX. CONCLUSION

For the above reasons, the Permit fails to comply with all applicable requirements, and the Administrator must object. Petitioners have demonstrated that the Permit was issued pursuant to numerous procedural and substantive errors. The Administrator must direct KDAQ to correct its errors by revising or revoking the Permit. To this end, the Administrator should include in her order specific terms and conditions necessary to remedy the inadequacies described in this petition. *See* 40 C.F.R. § 70.8(c)(2) ("Any EPA objection under paragraph (c)(1) of this section *shall* include… a description of the *terms and conditions that the permit must include* to respond to the objections" (emphasis added)).

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[120] *See* Exhibit 56, Khanh Tran, *Photochemical Modeling of Ozone Impacts of the Proposed White Stallion Energy Center.* Report prepared for Environmental Integrity Project, Austin, Texas. October 2009.

Respectfully submitted,

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On behalf of:
URSULINE SISTERS OF MOUNT SAINT JOSEPH
SIERRA CLUB
VALLEY WATCH

DATED: June 18, 2010

BEFORE THE ADMINISTRATOR
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

In the Matter of the Final Operating Permit for:

CASH CREEK GENERATION, LLC, to operate the proposed source located at Kentucky State Highway 1078, Henderson County, Kentucky

Permit No. V-09-006
Source I.D. No. 21-101-00134

Proposed by the Commonwealth of Kentucky, Environmental and Public Protection Cabinet

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CERTIFICATE OF SERVICE

I make this statement under oath and based on personal knowledge. On this day, June 18th, 2010, I caused to be served upon the following persons a copy of ELPC's Petition to the United States Environmental Protection Agency in the matter of the Final Revised Title V Operating Permit for the proposed Cash Creek Generation Station located at Kentucky State Highway 1078, Henderson County, Kentucky via electronic mail and U.S. Post.

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Meleah Geertsma
Environmental Law & Policy Center

Signed and sworn before me
This 18th day of June, 2010

Kay Tamillow
Notary Public, State of Illinois

KAY TAMILLOW
OFFICIAL SEAL
Notary Public, State of Illinois
My Commission Expires
November 09, 2013