No. 11-1302 (and consolidated cases) – Complex

Oral Argument Held April 13, 2012; decided August 21, 2012

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

EME HOMER CITY GENERATION, L.P.,
Petitioner,

v.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, ET AL.,
Respondents

On Petitions for Review of Final Action of the
United States Environmental Protection Agency

RESPONSE OF PUBLIC HEALTH INTERVENORS TO RESPONDENTS' MOTION TO LIFT THE STAY ENTERED ON DECEMBER 30, 2011 COMBINED WITH MOTION FOR ALTERNATIVE RELIEF

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RESPONSE OF PUBLIC HEALTH INTERVENORS TO RESPONDENTS' MOTION TO LIFT THE STAY ENTERED ON DECEMBER 30, 2011 COMBINED WITH MOTION FOR ALTERNATIVE RELIEF

Pursuant to D.C. Circuit Rule 27(c) and Fed. R. App. P. 27(a)(3)(B), respondent-intervenors American Lung Association, Clean Air Council, Environmental Defense Fund, Natural Resources Defense Fund, and Sierra Club (collectively, "Public Health Intervenors") respectfully submit this response to the Environmental Protection Agency's Motion to Lift the Stay Entered on December 30, 2011, and hereby also move for alternative relief.

Public Health Intervenors agree with EPA that the stay of the Cross-State Air Pollution Rule, 76 Fed. Reg. 48208 (Aug. 8, 2011) ("Transport Rule" or "Rule"), entered on December 30, 2011, should promptly be dissolved in light of the Supreme Court's decision in *Environmental Protection Agency v. EME Homer City Generation, L.P.*, 134 S. Ct. 1584 (2014), and the strong public interest in avoiding further delays in implementing the Rule's protections for public health.

We disagree, however, with EPA's recommendation that this Court should toll the Rule's implementation deadlines by three years. Such a substantial further delay would adversely affect public health and is not necessary to allow for orderly implementation of the Rule or to allow regulated entities (who have now had nearly an extra three years to prepare for compliance) to meet their obligations. Accordingly, Public Health Intervenors move that the Court order that the Rule's

Phase 2 budgets—originally scheduled to take effect in January 2014 (for the three annual programs) and May 1, 2014 (for the ozone season program)—take effect beginning January 1, 2015 and May 1, 2015, respectively.

A. THE STAY SHOULD BE LIFTED PROMPTLY

A stay is an "extraordinary remedy," *Cuomo v. U.S. Nuclear Reg. Comm'n*, 772 F.2d 972, 978 (D.C. Cir. 1985), amounting to "an 'intrusion into the ordinary processes of administration and judicial review.'" *Nken v. Holder*, 556 U.S. 418, 427 (2009) (quoting *Va. Petroleum Jobbers Ass'n v. FPC*, 259 F.2d 921, 925 (D.C. Cir. 1958)). A stay is "not a matter of right, even if irreparable injury might otherwise result," *Nken*, 556 U.S. at 427 (citation omitted). Instead, "it is the movant's obligation to justify the court's exercise of such an extraordinary remedy." *Cuomo v. USNRC*, 772 F.2d 972, 978 (D.C. Cir. 1985). *See also Nken*, 556 U.S. at 433-34. A movant must demonstrate "*both* a likelihood of success *and* a likelihood of irreparable harm." *Davis v. PBGC*, 571 F.3d 1288, 1296 (D.C. Cir. 2009) (emphasis in original) (Kavanaugh, J., joined by Henderson, J., concurring); *accord Sherley v. Sebelius*, 644 F.3d 388, 392-93 (D.C. Cir. 2011).

As EPA demonstrates, the relevant circumstances have changed markedly from those prevailing when the stay was entered on December 30, 2011. After this Court vacated the Transport Rule in its August 2012 decision, 696 F.3d 7, the Supreme Court granted petitions for certiorari filed by EPA and the Public Health

Intervenors and reversed this Court's decision, rejecting both rationales on which this Court had found the Rule invalid and which had been central themes in many of the stay motions. *See* 134 S. Ct. at 1609-10. While this Court (and the Supreme Court) did not reach certain of the challengers' claims, those claims (*see* Industry Motion to Govern 6 (Doc. 1500963); State and Local Petitioners' Motion to Govern 4-5 (Doc. 1500966)) consist of further attacks on EPA budget-setting methodology—a decidedly uphill effort given the Supreme Court pronouncement of EPA's approach as "a permissible, workable, and equitable interpretation of the Good Neighbor Provision," *id*. at 1610—challenges to EPA's modeling and other technical judgments, and challenges to particular applications of the Transport Rule. For the reasons that "uncommon particular applications" would not warrant invalidating the entire Rule, *see* 134 S. Ct. at 1608-09, petitioners' as-applied claims do not justify continuing the December 30, 2011, stay of the entire Rule.

The circumstances—including (1) reversal by the Supreme Court of the two main rationales of this Court's 2012 merits decision; (2) a 2011 stay order that provides no basis for believing that a continuing stay is warranted absent those two rationales; and (3) the lapse of far more time than was identified by EPA as sufficient for sources to install any needed pollution controls—provide compelling reasons for the Court to revisit the stay, and to place the burden on petitioners to justify the continued existence of this extraordinary remedy.

There is a strong public interest in timely control of harmful air pollution, particularly where, as here, the pollution affects most of the country's population (*see* 76 Fed. Reg. at 48309, 48313-14). Premature deaths, asthma attacks, and other pollution-induced health impacts cannot be undone once they occur. *See Amoco Prod. Co. v. Vill. of Gambell*, 480 U.S. 531, 545 (1987) ("Environmental injury, by its nature, can seldom be adequately remedied by money damages and is often permanent or at least of long duration, *i.e.*, irreparable."); *EDF v. EPA*, 898 F.2d 183, 190 (D.C. Cir. 1990) (keeping intact faulty nitrogen oxide regulations because vacating "would at least temporarily defeat petitioner's purpose, the enhanced protection of the environmental values covered by the PSD provisions"); *see also Davis County Solid Waste Mgmt. v. EPA*, 108 F.3d 1454, 1458-59 (D.C. Cir. 1997); *Coleman v. Paccar, Inc.*, 424 U.S. 1301, 1307 (1976) (vacating a 60-day stay of motor vehicle safety standard found by the agency likely to prevent accidents) (Rehnquist, J., in chambers).

The Clean Air Interstate Rule (CAIR), invalidated more than six years ago but still in effect, does not justify any further delays in implementing the Transport Rule. CAIR is not as protective (indeed, it does not address one of the health standards addressed in the Transport Rule, namely, the 2006 24-hour fine particle standard)—and in particular allows substantially greater sulfur dioxide emissions that cause large numbers of premature deaths and other health impacts that the Transport Rule

would prevent. *See* Declaration of David Schoengold, at pp. 12-14 (Ex. A to the consolidated stay opposition filed by Public Health Intervenors on Dec. 1, 2011 (Doc. 1345215)). CAIR also lacks critical measures that the Transport Rule includes specifically to implement this Court's mandate in *North Carolina*, including assurance provisions designed to "ensure that the necessary emission reductions occur within each covered state," *id.* at 48271, as well as compliance schedules intended to provide timely relief for downwind States, 76 Fed. Reg. at 48277. Furthermore, in practical effect, CAIR sulfur dioxide allowances are near valueless, with the supply of allowances greatly exceeding demand so that there is little constraint on emissions.[1] Compliance with the Transport Rule, on the other hand, would require operation of *existing* pollution controls that are currently being turned off or not fully operated under the weaker CAIR regime. *See* EPA Motion, Attachment A, Declaration of Reid Harvey ¶¶ 45, 48; *see also* Declaration of Ranajit Sahu ¶¶ 7, 8, 9, 13, 14, 24 (Attachment A).

[1] *See* http://www.epa.gov/airmarkt/trading/2014/index.html (*accessed* July 10, 2014) (the clearing price for sulfur dioxide allowances at EPA's 2014 auction was $0.35; under CAIR, two allowances are surrendered for each ton of sulfur dioxide reductions—thus, CAIR sulfur dioxide allowances cleared at $0.70 per ton); *see also* MJ Bradley & Associates, Benchmarking Air Emissions of the 100 Largest Power Producers of the United States at 24 (May 2014) (noting actual emissions of sulfur dioxide 30% below CAIR budgets) (available at http://mjbradley.com/benchmarking-air-emissions) (accessed July 10, 2014); *see also* Declaration of Ranajit Sahu, dated July 11, 2014, at ¶ 33 (Attachment A).

With respect to interstate air pollution, there have already been extreme—and unlawful—delays in implementing basic statutory requirements; the health-based national air quality standards at issue here were promulgated seventeen and eight years ago, and it was six years ago that this Court, in *North Carolina*, ruled that statutory attainment deadlines are among the requirements that EPA must meet in implementing the Good Neighbor provision—and remanded because CAIR had failed to do so. 531 F.3d at 911-12. Indeed, *North Carolina* rejected the suggestion that 2015 was an appropriate deadline for CAIR compliance. *Id*. at 913. Multiple additional years of delay are inconsistent with *North Carolina*, especially given that the air quality standards at issue in CAIR (the 1997 particulate matter and ozone standards) are also covered by the Transport Rule. *See also* 550 F.3d at 1178 (*North Carolina* panel's admonition in remanding CAIR without vacatur that "[t]hough we do not impose a particular schedule by which EPA must alter CAIR, we remind EPA that we do not intend to grant an indefinite stay of the effectiveness of this court's decision").

Moreover, the December 2011 stay was entered in response to urgent claims from many of the stay movants that the Rule's imminent implementation would impose extreme and untenable burdens on companies and States struggling to comply. *See* EME Homer Stay Motion (Doc. #1325939) at 3 ("The Rule will distort electricity markets, lower electric generation output, and effect a massive (at least

$1.5 billion) wealth transfer in 2012-2013."), *see also*, *e.g.*, *id*. at 6, 16-20. Actual experience has proven those claims to be exaggerated and inaccurate. *See* EPA Motion 18-19 & n.8; *see also* Harvey Dec. pp. 10-14, Tables 1-4.

Finally, the December 2011 stay was not designed to last for years. *Cf. Belize Soc. Dev. Ltd. v. Gov't of Belize*, 668 F.3d 724, 731-32 (D.C. Cir. 2012) (stay of "indefinite duration" impermissible "in the absence of a pressing need") (citation omitted). The Court scheduled the case for expedited briefing and oral argument within three and a half months of the entry of the stay because it recognized the time sensitivity of the matter, given the stay. *See* Stay Order (Dec. 30, 2011) (ordering "on the court's own motion, that the parties submit by January 17, 2012, proposed formats and schedules for the briefing of these cases that would allow the cases to be heard by April 2012"); Briefing Order (Jan. 18, 2012) (expedited briefing format and setting oral argument requiring that briefing be completed by March 12, 2012).

The December 2011 stay order, moreover, included no findings of facts or legal rationale of the sort that, in a district court, would be required for injunctive relief beyond a 15-day temporary restraining order, *cf.* Fed. R. Civ. P. 65(d)(1). The stay was not structured to last for years or to outlast multiple merits judgments; it included no provisions by which the stay itself would go into abeyance after the final judgment and issuance of a mandate from this Court vacating the Transport Rule, but then spring back into life upon a Supreme Court reversal of this Court's decision.

A stay designed to freeze things in place for a few months during expedited merits consideration should not be transformed into a multi-year injunction against a major federal program of great importance to public health. Any further delays of the implementation of the Transport Rule must be affirmatively justified in light of current realities, with the burden upon the parties seeking more delay to demonstrate a current likelihood of success on the merits and current irreparable injury—and that a stay of the entire Rule is justified despite the attendant harm to public health from such a broad injunction.

B. EPA'S PROPOSED THREE-YEAR TOLLING FAILS TO SERVE THE CLEAN AIR ACT'S INTEREST IN TIMELY POLLUTION REDUCTIONS

While we support EPA's demonstration that the stay should be promptly lifted, Public Health Intervenors do not support EPA's further request that the Court should "toll for three years all Transport Rule compliance deadlines that had not passed as of the date of the stay." EPA Motion 14.

The stay was entered on December 30, 2011, five months after the Transport Rule was promulgated and two days before the beginning of the Rule's first compliance year, on January 1, 2012. Had it not been for the stay, the Transport Rule would now be in its third year of implementation, and the Rule's more stringent Phase 2 emissions budgets would have been in effect for more than six months for

the annual programs, and more than three months for the ozone-season nitrogen oxides program.

EPA's proposal to toll the Rule so that Phase 2 would not begin until 2017 comes at a significant cost to the public health. As EPA explains, EPA Motion at 9-10, the health benefits of the Rule are enormous. EPA estimated that the Rule will save tens of thousands of lives per year, avoid hundreds of thousands of serious illnesses, and improve air quality for 240 million Americans. 76 Fed. Reg. at 48309, 48313-14. For example, beginning in 2014 (the first year projected to be subject to the Phase 2 budgets), the reductions in fine particulate pollution ($PM_{2.5}$) expected under the Rule would

> annually reduce between 13,000 and 34,000 $PM_{2.5}$-related premature deaths, 15,000 non-fatal heart attacks, 8,700 incidences of chronic bronchitis, 8,500 hospital admissions, and 400,000 cases of aggravated asthma while also reducing 10 million days of restricted activity due to respiratory illness and approximately 1.7 million work-loss days.

Id. at 48309. *See also id*. at 48309 (reductions in ozone pollution would mean fewer days when high smog levels compel restricted outdoor activity).

The *timely* abatement of air pollution is manifest in the Clean Air Act. *See, e.g.*, *Union Elec. Co. v. EPA*, 427 U.S. 246, 256 (1976) (Act was "a drastic remedy to what was perceived as a serious and otherwise uncheckable problem of air pollution"); *General Motors Corp. v. U.S.*, 496 U.S. 530, 532-33 (1990). The Act places a premium on timely attainment of the health-based standards that are the

core of the Act: Section 110(a)(1) requires States to submit conforming SIP revisions within three years after promulgation of a new or revised standards, 42 U.S.C. 7410(a)(1), and provides that an area designated as nonattainment must, absent an extension from EPA, attain standards "as expeditiously as practicable, but no later than 5 years from the date such area was designated nonattainment," 42 U.S.C. 7502(a)(2)(A); *see id.* 7511(a)(1) (setting ozone-specific attainment deadlines); 7513(c) (setting particulate matter-specific attainment deadlines); *see also Sierra Club v. E.P.A.*, 294 F.3d 155, 161-62 (D.C. Cir. 2002) (refusing to extend statutory ozone attainment deadlines because doing so would "subvert the purposes of the Act"); *id*. at 161 (noting that "the attainment deadlines are 'central to the … regulatory scheme'") (quoting *Union Elec. Co. v. EPA*, 427 U.S. at 258).

In *North Carolina*, this Court held that one of CAIR's primary flaws was EPA's failure to coordinate that rule's timing of upwind emission reductions with the air quality compliance deadlines faced by the affected downwind States. 531 F.3d at 911-12. As this Court explained, this failure violated the "consistent with the provisions of this subchapter" language, which incorporates the compliance deadlines of downwind States and their "expeditiously as practicable" obligation. *Id*. at 912; *see also id*. at 930 (EPA "must decide what date, whether 2015 or earlier, is as expeditious as practicable for states to eliminate their significant contributions to downwind nonattainment").

"[C]onsistent with the charges given ... in *North Carolina*," EPA aligned the Transport Rule compliance dates with attainment deadlines for the relevant air quality standards. 76 Fed. Reg. at 48277. For the 1997 ozone standard, EPA required compliance in 2012, and for the 1997 and 2006 fine particulate ($PM_{2.5}$) standards, EPA established a two-stage compliance schedule with a first round of nitrogen oxides and sulfur dioxide reductions required in 2012, and a second, deeper round of sulfur dioxide reductions required in 2014 for some States.

> In selecting these dates, EPA was mindful of the NAAQS attainment deadlines which require reductions as expeditiously as practicable and no later than specified dates (see 42 U.S.C. 7502(a)(2)(A) (general attainment dates); 42 U.S.C. 7511(a)(1) (attainment dates for ozone nonattainment areas)), and also mindful of the court's instruction to ''decide what date, whether 2015 or earlier, is as expeditious as practicable for states to eliminate their significant contributions to downwind nonattainment.'' *North Carolina,* 531 F.3d at 930.

76 Fed. Reg. at 48277. EPA explained in detail how the schedule for implementing the Rule was necessary in light of imminent attainment deadlines for each of the three standards, including deadlines falling in 2012, 2013, 2014, and 2015. *See id.* at 48277-78; *see also* 75 Fed. Reg. 45210, 45300 (Aug. 2, 2010) (noting that EPA chose the 2012/2014 schedule "to coordinate with the NAAQS attainment deadlines and to assure that reductions are made as expeditiously as practicable," and to "address the [*North Carolina*] Court's concern about timing"); *id.* at 45301. Those deadlines (as well as the Act's "expeditiously as practicable" mandate) have not

changed. The *timing* of the emissions reductions was thus a critical part of the Rule—and of implementing *North Carolina*'s mandate.

Tolling the deadlines to delay Phase 2 of the Rule until 2017 would likely mean numerous premature deaths, asthma attacks, and other serious adverse health effects that cannot be undone. Those losses to public health and the environment are irreparable in the most basic sense: a person who is killed or sickened by air pollution is not compensated by the fact that the air is cleaned up later. *See Amoco Prod. Co.*, 480 U.S. at 545. Because it would mean irreparable losses to public health, and further delay a Transport Rule schedule in which time was of the essence, it is not accurate to describe the proposed tolling approach as faithfully restoring the pre-stay "status quo." EPA Motion 15. As noted, the timing of the emission reductions here was a central part of the Rule's implementation of *North Carolina*'s timing-related admonitions. Any further remedial interventions must be crafted to preserve, to the extent reasonably possible, the intended health benefits on the original schedule.

While EPA correctly cites the health benefits as a factor supporting the lifting of the stay, EPA Motion at 9-10, its proposed schedule gives scant weight to the public health consequences of EPA's requested three-year tolling, and the agency fails to explain why a more expeditious schedule is not possible. EPA's motion relies principally upon the approach this Court followed in terminating the stay of

the NOx SIP Call. In that case, the Court ordered that the rule's start date should be tolled so as to provide States the same amount of time (128 days) to submit State Implementation Plan revisions to EPA that had remained when the stay had been entered. *See* Order, *Michigan v. EPA*, No. 98-1497, at 2 (June 22, 2000) (Att. B to EPA Motion).

But the unpublished stay-lifting order in *Michigan* does not support, let alone command, EPA's proposed approach here. First, as the challengers have emphasized, *e.g.*, 134 S. Ct. at 1601-02, the NOx SIP Call was implemented by means of EPA-approved revisions to State Implementation Plans, so that there was a greater need for lead time than is present here, whereas the Transport Rule's emissions reductions are implemented through already-promulgated federal implementation plans. Furthermore, there was no analogue in *Michigan* to *North Carolina*'s mandate that EPA devise an implementation schedule that accords with particular air quality standard compliance dates. And the overall quantum of delay here is much greater than was imposed in *Michigan*: there, the stay was in effect for a little over a year.

Moreover, following the approach employed in *Michigan* would yield a result significantly different than EPA has proposed—it would mean the Transport Rule's obligations would take effect two days after the entry of an order by this Court. Prior to entry of the stay, regulated entities had the entire period between August 2011 and

the end of December 2011, in which to prepare for compliance. EPA's proposed tolling approach writes off that period. *See* EPA Motion 15.

Most importantly, *Michigan* does not purport to establish a single rigid rule to govern the inherently context-dependent task of crafting appropriate terms and conditions for dissolution of a judicial stay of regulations—a task that requires respect for the mandates and purposes of the governing statute as well as the application of equitable principles.

A current assessment of the statutory structure, practical realities, and the equities favors expeditious implementation of Phase 2 of the Rule. Companies have had approximately *three years* since the final promulgation of the Transport Rule in which to obtain any necessary pollution-control improvements to their facilities—the time by which EPA estimated they could complete such improvements (*e.g.*, 76 Fed. Reg. at 48277) passed more than seven months ago. *See* 76 Fed. Reg. at 48277 ("a deadline of January 1, 2014 ... provides adequate and reasonable time for sources to plan for compliance with the Transport Rule and install any necessary controls. EPA believes that this deadline is as expeditious as practicable for the installation of the controls, if any, needed for compliance"). In almost all States, emissions levels were below those set out in Phase 1 of the Transport Rule in 2012 and 2013. *See* Harvey Dec. Tables 1-4. Even if Phase 2 were to go into effect immediately, regulated entities have had more time to adjust than they were allowed under the

Rule as promulgated. Regulated entities have had ample time to make investments in and install pollution control equipment.[2]

When a court stays a challenged regulation, the moving parties do not obtain prescriptive rights in the interlocutory regime; instead, they assume the risk that they may lose on the merits and the regulation will take effect.[3] The December 2011 stay excused parties from having to comply with the Transport Rule only so long as the stay was in effect. But any regulated entity that chose to delay installation of pollution controls on the strength of the Court's temporary stay order did so at its own risk. Parties that chose to gamble on the Rule being struck down should not be allowed to cast the burden of its self-serving and incorrect wager upon the public. *Cf. Train v. NRDC*, 421 U.S. 60, 92 (1975) (litigation challenging EPA's refusal to grant waivers from Clean Air Act compliance is "carried out on the polluter's time, not the public's").

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[2] Petitioner EME Homer, in advocating a stay, cited EPA's analysis for the proposition that "it takes about 27 months to install a scrubber [to control sulfur dioxide emissions] and 21 months to install an SCR [to control emissions of nitrogen oxides emissions]." EME Homer Stay Motion at 19 (citing 75 Fed. Reg. 45281) (Doc. 1325939).

[3] Indeed, when a party obtains interim relief and later loses on the merits, it is presumptively liable to pay for harms to the opposing part as a result of the injunction, *see* Fed. R. Civ. P. 65(c), Wright & Miller, 11A Fed. Prac. & Proc. Civ. § 2954; the impracticability of that option here reflects the same practical concerns that make public health and environmental harms irreparable.

C. IMPLEMENTATION OF PHASE 2 BEGINNING IN JANUARY 2015 IS FEASIBLE AND APPROPRIATE, AND THERE IS NO VALID REASON TO DELAY THE COMMENCEMENT OF PHASE 2 UNTIL JANUARY 2017

As EPA explains, the Transport Rule was designed to operate on a calendar-year basis, and deferring the effectiveness until January 1, 2015 would harmonize the Rule with other regulatory requirements. EPA Motion at 15-16. This period would also provide a substantial additional period of time for regulated entities to prepare for compliance. We therefore agree that it would be reasonable for the Court, in dissolving the stay, to provide that the Rule's requirements should not take effect until January 1, 2015.

However, tolling the Phase 2 compliance schedule until January 2017 is unnecessary, unjustified, and incompatible with the Clean Air Act and the Transport Rule. As described above, EPA designed the Transport Rule's implementation schedule to be consistent with the Clean Air Act's mandate (as recognized by this Court in *North Carolina*) that all States must achieve the national air quality standards as "expeditiously as practicable" (even if that is earlier than the statutory outer deadlines) and in no event later than those outer deadlines. *See* 76 Fed. Reg. at 48277. The Transport Rule was published in the Federal Register on August 8, 2011. EPA determined that what was "practicable" starting in January 2012 (or within five months of publication) was that the power sector could readily achieve the significant reductions required under Phase 1 of the Rule by "operating existing

controls, installing combustion controls, fuel switching, and increased dispatch of lower-emitting generation." *See id.* at 48252. Although EPA determined that further reductions under Phase 2 would ultimately be necessary for States to fulfill their Good Neighbor obligations, EPA determined that a 2014 Phase 2 deadline was as "expeditious as practicable" to allow sources to install additional pollution controls to achieve those additional reductions. *See id.* at 48277. In other words, EPA determined that States should and could achieve significant Good Neighbor reductions with less than five months lead-time by using existing controls and generation resources, but would get more lead-time to install new pollution controls.

Applying this same standard at the present time, therefore, would require each State to achieve those Good Neighbor reductions that it can practicably achieve beginning in January 2015 (or May 2015 for the ozone-season nitrogen oxides program). Due to changes in the power sector since 2011, including past and announced retirements of higher-emitting generating units, States can practicably achieve those reductions necessary to meet their Transport Rule Phase 2 assurance levels (*i.e.*, their emissions budgets plus variability limits) in 2015. In fact, as shown by EPA's analysis, emissions in most States during the past two years were already below their Phase 2 budgets or assurance levels. Harvey Dec. ¶¶ 40, 41, 44, 47; Tables 1-4. States that have not already demonstrated compliance with their Phase 2 assurance levels can achieve the necessary reductions through a combination of

fully operating existing or soon-to-be completed controls, completing announced retirements, and increasing dispatch of lower-emitting generation. Sahu Dec. ¶¶ 9-10, 15-16, 20-21, 24, 26, 27-29, 30-32.

Despite wide-scale compliance in 2012 and 2013 with Phase 2 of the Transport Rule, implementing the Rule expeditiously remains critical. Overall emissions reductions over the past two years benefited public health and demonstrated the feasibility of a prompt transition from CAIR to the Transport Rule, but those reductions were neither directly attributable to CAIR nor necessarily persistent, *see* Harvey Dec. ¶ 49. As EPA's declarant notes, sulfur dioxide and nitrogen oxides emissions in the first quarter of 2014 exceeded emissions during the same period last year. *Id.*

The pollutants at issue are harmful to public health, and removing them from the air sooner will bring significant health benefits.[4] In order to ensure that these considerable health benefits are fully realized as "expeditiously as practicable" throughout the Transport Rule region, Phase 2 and its assurance provisions should

[4] One indication of the urgency of achieving pollution controls sooner rather than later may be found in EPA's calculation that, during the first year in which Phase 2 was planned to be in effect, each ton of sulfur dioxide and nitrogen oxides emissions avoided would result in between $26,190 and $66,667 in public benefits, primarily from avoided health harms. The benefits per ton avoided figure results from dividing the Rule's projected annual benefits in 2014 ($110-$280 billion), 76 Fed. Reg. at 48215, Table III-4, by its projected sulfur dioxide and nitrogen oxides reductions in that year (4.2 million tons combined), *id.* at 48214-15, Table III-2.

be implemented in 2015. This Court in *North Carolina* directed EPA to correct a fundamental deficiency in CAIR—namely, that by allowing unlimited interstate trading, emissions might become concentrated in upwind States where additional reductions would be most expensive. *See* 531 F. 3d at 907. This deficiency, which remains under Phase 1 of the Transport Rule, may result in some downwind areas not getting the relief from out-of-state air pollution that the Clean Air Act mandates and which would allow them to expeditiously achieve attainment. Furthermore, the residents of those upwind States where emissions are concentrated and reductions are late in coming will continue to bear health risks from deleterious air pollution.

In addition, requiring Phase 2 to go into effect beginning in 2015 will more closely approximate the Transport Rule regime as adopted. Beyond the power sector's current capacity to more fully utilize existing controls, switch to cleaner-burning fuels, and increase dispatch of lower-emitting generation, *see* Sahu Dec. ¶¶ 9-10, 15-16, 20-21, 24, 26, 27-29, 30-32, the Rule's structure allows regulated entities to meet their budgets over a full year for the sulfur dioxide and annual nitrogen oxides programs (as opposed to mandating a particular emissions rate on an hourly, daily, or monthly basis); to comply by obtaining credits from others; and gives them until three months after the end of the compliance period in which to obtain the necessary allowances—thereby providing significant flexibility for individual sources.

CONCLUSION

The Court should enter an order dissolving the stay and adjusting the Transport Rule's implementation schedule such that the Phase 2 obligations will commence on January 1, 2015, for the annual programs, and May 1, 2015, for the ozone season nitrogen oxides program.

Respectfully submitted,

/s/ Sean H. Donahue

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July 11, 2014

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing RESPONSE OF PUBLIC HEALTH INTERVENORS TO RESPONDENTS' MOTION TO LIFT THE STAY ENTERED ON DECEMBER 30, 2011 COMBINED WITH MOTION FOR ALTERNATIVE RELIEF were served on this 11th day of July, 2014, on all registered counsel, through the Court's CM/ECF system.

/s/ Sean H. Donahue

Attachment A

UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

EME HOMER CITY GENERATION, L.P.,	)	
	)	
Petitioner,	)	
	)	
v.	)	No. 11-1302 (and
	)	consolidated cases)
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *et al.*,	)	
	)	
Respondents.	)	
	)	

DECLARATION OF RANAJIT SAHU

1. I, Ranajit ("Ron") Sahu, under penalty of perjury, affirm and declare that the following statements are true and correct to the best of my knowledge and belief, and are based upon my own personal knowledge or on information contained in the records cited herein.

2. I am an engineer and an independent environmental consultant. I have over twenty three years of experience in the fields of environmental, mechanical, and chemical engineering including: program and project management services; design and specification of pollution control equipment; soils and groundwater remediation; combustion engineering evaluations; energy studies; multimedia environmental regulatory compliance (involving statutes and regulations such as the Federal CAA and its Amendments, Clean Water Act, TSCA, RCRA, CERCLA, SARA, OSHA, NEPA as well as various related state statutes); transportation air quality impact analysis; multimedia compliance audits; multimedia permitting (including air quality NSR/PSD permitting, Title V permitting, NPDES permitting for industrial and storm water discharges, RCRA

permitting, etc.), multimedia/multi-pathway human health risk assessments for toxics; air dispersion modeling; and regulatory strategy development and support including negotiation of consent agreements and orders.

3. Specifically, I have consulted for various clients with regards to Clean Air Act rulemakings by the EPA for over 10 years. A copy of my resume is provided at Exhibit 1 to this Declaration.

4. I am filing this Declaration in support of the Response of Public Health Intervenors to Respondents' Motion to Lift the Stay Entered on December 30, 2011 Combined with Motion for Alternative Relief.

Ozone Season NOx Emissions

5. I believe that the Transport Rule Phase 2 ozone-season NOx emissions budgets are achievable by April 1, 2015 (i.e., 2 years prior to that proposed by EPA) based on the analysis prepared by EPA (Declaration of Reid Harvey, Table 4), and supplemented with my own detailed analysis of the affected EGUs, including those in Missouri. My conclusions are based on a comparison of (1) actual 2012 and 2013 ozone-season NOx emissions, and (2) the Phase 2 assurance levels and Phase 2 emissions budgets. I begin my analysis with a review of the Phase 2 assurance levels, followed by a discussion of the Phase 2 emissions budgets.

6. I focus my analysis first on the assurance levels because they place a firm cap on emissions from EGUs in each of the covered states. EPA's analysis finds that all covered states, with the sole exception of Missouri, report 2012 and/or 2013 emissions below their Phase 2 assurance levels. In many cases, 2012 and 2013 emissions are well below the individual state assurance levels, leaving a significant margin for potential emissions increases. Since it is the only state

exceeding its assurance limit in both 2012 and 2013, I conducted a detailed analysis of the affected EGUs in Missouri to determine whether the increased utilization of pollution control systems already installed at some Missouri power plant units or other measures would reduce their emissions below the state's assurance level without the need to construct and operate additional pollution control equipment.

7. In 2013, EGUs in Missouri emitted 31,482 tons of NOx emissions during the ozone season (Declaration of Reid Harvey). This level of emissions exceeds the state's Phase 2 assurance level by 5,952 tons. In reviewing data reported to EPA's Clean Air Markets Division by Missouri EGUs, I found that 25 EGUs accounted for more than 90 percent of the state's ozone-season NOx emissions in 2012 and 2013. These 25 EGUs are listed in Table 1 (all tables are attached to the end of this Declaration). Ten of these EGUs have advanced NOx control systems installed, specifically selective catalytic reduction (SCR). SCR is an advanced form of NOx control that can achieve low levels of NOx emissions when properly maintained and operated. The remaining 15 units in Missouri also have some form of NOx control, but not SCR. Assuming that just these ten EGUs ran their SCR systems fully, returning their emissions to better controlled levels, I calculate that the state would reduce its ozone-season NOx emissions by almost 12,000 tons—or double the level of reductions necessary to bring the state's emissions in line with its Phase 2 assurance level. My analysis assumes that all units operate at their average 2012-2013 heat input levels.

8. Table 1 summarizes my analysis of Missouri ozone-season NOx emissions. I assume that eight of the EGUs with SCR controls already installed can reduce their NOx emission rates to the levels they themselves achieved in earlier ozone-seasons (on average 0.11 lbs/MMBtu, which by itself is conservatively high for NOx emissions for coal-fired units equipped with SCR). Specifically, each unit is

assumed to achieve a NOx emission rate equal to the average of the three lowest ozone-season NOx rates it actually achieved in the period from 2008 to 2012. By using the average of three ozone-season emission rates, rather than a single best rate, I believe that these improved levels of performance should be readily achievable. Two other EGUs with SCR controls are assumed to simply maintain their 2013 NOx emission rates. I assume for the purpose of this analysis that EGUs without SCR controls continue operating at their 2013 NOx emission rates (i.e., no improvement assumed). Again, I assume that all units operate at their average 2012-2013 heat input levels. One unit in Missouri is reported to have closed in September 2013 and its emissions have been removed from the inventory.[1]

9. Based on these findings, I believe that the Transport Rule Phase 2 ozone-season NOx assurance levels are achievable by all states starting April 1, 2015, with compliance demonstration by December 1, 2015, which is the compliance timeframe required under the Rule. First, no new control equipment needs to be installed to meet the assurance level. Second, a small number of units in just one state (Missouri) would need to fully operate their already-installed SCR control systems.

10. Next I evaluated the ozone-season NOx emissions budgets. The state emissions budgets limit aggregate region-wide NOx emissions during the summer ozone-season. Unlike the assurance levels, they do not limit an individual state's emissions. As shown in Table 4 of EPA's analysis, region-wide emissions in 2013 were below the aggregate Phase 2 emissions budgets. In 2012, region-wide emissions were less than 3 percent above the aggregate state budgets (or 16,677 tons). Based on the number of EGU retirements that are scheduled to occur

[1] Central Electric Power Cooperative. News and Events: Coal power plant and parts to be sold. April 25, 2013. http://www.cepc.net/news-and-events.

between now and April 2015, as well as the potential to recommence operation of idled SCR systems or to fully operate SCR systems in Missouri and other states, I believe that the Transport Rule Phase 2 ozone-season NOx emissions budgets are achievable starting April 1, 2015.

Annual NOx Emissions

11. I believe that the Transport Rule Phase 2 annual NOx emissions budgets are readily achievable by January 1, 2015 based on the analysis prepared by EPA (Declaration of Reid Harvey, Table 3), and supplemented with my own detailed analysis of the affected EGUs in Missouri, the only state whose 2012 and 2013 emissions exceeded the Phase 2 annual NOx assurance level. My conclusions are based on a comparison of (1) actual 2012 and 2013 annual NOx emissions, and (2) the Phase 2 assurance levels and Phase 2 emissions budgets. I begin my analysis with a review of the Phase 2 assurance levels, followed by a discussion of the Phase 2 emissions budgets.

12. Similar to the ozone-season analysis, EPA finds that all covered states, with the exception of Missouri, report 2012 and 2013 emissions below their Phase 2 assurance levels. Again, I conducted a detailed analysis of the affected EGUs in Missouri to determine whether the increased utilization of pollution control systems already installed at some Missouri power plant units or other measures would reduce their emissions below the state's assurance level without the need to construct additional pollution control equipment.

13. In 2013, EGUs in Missouri emitted 75,943 tons of NOx emissions (Declaration of Reid Harvey, Table 3). This level of emissions exceeds the state's annual Phase 2 assurance level by 18,426 tons. In reviewing data reported to EPA's Clean Air Markets Division by Missouri EGUs, I found that 27 EGUs

accounted for more than 90 percent of the state's annual NOx emissions in 2012 and 2013. These 27 EGUs are listed in Table 2. Ten of these EGUs have SCR controls already installed. The remaining 17 units have some form of NOx control, but not SCR. Assuming that just these ten EGUs fully operated their respective SCR systems, returning their emissions to better controlled levels, I calculate that the state would reduce its annual NOx emissions by more than 30,300 tons—i.e., significantly more than necessary to bring the state's emissions to below its Phase 2 assurance level. My analysis assumes that all units operate at their average 2012-2013 heat input levels.

14. Table 2 summarizes my analysis of Missouri annual NOx emissions. I assume that seven of the EGUs with SCR controls already installed can reduce their NOx emission rates to the levels they themselves achieved in earlier years (on average 0.16 lbs/MMBtu, which is conservatively high compared to NOx emissions from well controlled SCRs).[2] Specifically, each unit is simply assumed to achieve a NOx emission rate equal to the average of the three lowest annual NOx rates it actually achieved in the period from 2008 to 2012. By using the average of three annual emission rates, rather than a single best rate, I believe that these levels of performance should be readily achievable. Three other EGUs with SCR controls are assumed to maintain their 2013 NOx emission rates. I assume for the purpose of this analysis that EGUs without SCR controls continue operating at their 2013 NOx emission rates (i.e., no improvement assumed). Again, I assume that all units operate at their average 2012-2013 heat input levels. One unit in

[2] This is a conservative assumption. As illustrated by the ozone-season analysis, EGUs with SCR controls installed are capable of achieving lower NOx emission rates than implied by using an annual average emission rate.

Missouri is reported to have closed in September 2013 and its emissions have been removed from the inventory.[3]

15. Based on these findings, I believe that the Transport Rule Phase 2 annual NOx assurance levels are achievable by all states starting January 1, 2015, with a compliance demonstration by March 1, 2016, which is the compliance timeframe required under the Rule. As with the ozone-season analysis discussed earlier, no new control equipment needs to be installed to meet the assurance level in any state including Missouri. A small number of units in just one state (Missouri) would simply need to operate their already-installed SCR control systems.

16. Next I evaluated the annual NOx emissions budgets. The state emissions budgets limit aggregate region-wide NOx emissions. Unlike the assurance levels, they do not limit an individual state's emissions. As shown in Table 3 of the Harvey Declaration, region-wide emissions in 2012 and 2013 were already below the aggregate Phase 2 emissions budgets. And, based on a number of additional EGU retirements that are scheduled to occur before January 1, 2015, as well as the potential to recommence operation of (or begin to fully operate) idled SCR systems in Missouri and other states, I believe that the Transport Rule Phase 2 annual NOx emissions budgets are readily achievable by January 1, 2015.

Annual SO_2 Emissions

17. I believe that the Transport Rule Phase 2 annual SO_2 emissions budgets are readily achievable starting on January 1, 2016 and also achievable starting even earlier on January 1, 2015 based on the analysis prepared by EPA (Declaration of Reid Harvey, Tables 1 and 2), and supplemented with my own detailed analysis as discussed below.

[3] Central Electric Power Cooperative. News and Events: Coal power plant and parts to be sold. April 25, 2013. http://www.cepc.net/news-and-events.

18. Actual 2013 SO_2 emissions from the affected EGUs in four states—Indiana, Kentucky, Pennsylvania, and Ohio—exceeded their Phase 2 assurance levels by significant margins (see Table 1, Harvey Declaration). In addition, actual 2013 emissions from EGUs in three other states—Michigan, Wisconsin and Texas exceeded their respective Phase 2 assurance levels by relatively smaller levels (see Tables 1 and 2, Harvey Declaration). However, with the Mercury and Air Toxics Standards (MATS) rule coming into effect in April 2015 and coal-fired EGUs retiring in 2014 (and 2015), my analysis shows that SO_2 emissions in many states can and will be below their 2012 and 2013 levels, assuming similar heat inputs.

19. Although Texas's actual 2013 emissions from EGUs were above its Phase 2 assurance levels, merely returning to 2012 emission levels would bring Texas into compliance with its Phase 2 assurance level (see Harvey Declaration, ¶ 42). I note that significant lower-emitting natural gas combined cycle units and wind resources have come or are coming on line in Texas in 2014 and 2015 as reported to the Energy Information Administration (EIA).[4]

20. The largest sources of SO_2 emissions in Michigan are Monroe Units 1 and 2. However, two new scrubbers have been installed at these units recently.[5] The company that operates Monroe indicates that the project will cut SO_2 emissions by 97%. Based on the plant's average pre-scrubber SO_2 emissions in 2011, 2012, and 2013, that would translate to more than 40,000 tons of SO_2 reduced from these two units alone. In 2013, Michigan was above its phase 2 assurance level by 24,476

[4] *See* EIA EPM Table 6.5. About 2,200 megawatts of natural gas combined cycle coming on line in 2014 with more in 2015. Several hundred megawatts of wind coming online in 2014/2015.

[5] *See* http://www.electricityforum.com/news/jun09/Newscrubbersonlineat Monroeplant.html (*accessed* July 9, 2014). The Unit 1 scrubber was operational starting October 2013 and the Unit 2 scrubber is operational as of June 2014.

tons. Therefore, the scrubber retrofits at Monroe should bring the state below that level.

21. 2013 actual emissions from Wisconsin power plant units were around 62,000 tons, or approximately 6,000 tons over the state's assurance level of 56,502 tons. Of these actual emissions, over a third, or over 22,000 tons, were from Columbia Units 1 and 2 alone. However, by the end of 2014, scrubbers will be operational at these two units, reducing SO2 emissions by approximately 90%[6]—or around 20,000 tons. Thus, I believe Wisconsin can meet its Phase 2 SO_2 assurance level starting in 2015 with no difficulty. In addition, many units have announced retirements by the end of 2015.

22. Next, I focus below on the four Group 1 states whose 2013 actual emissions were significantly greater than their respective Phase 2 assurance levels. The table below summarizes the 2013 SO_2 emissions from affected sources and the Phase 2 assurance levels in Pennsylvania, Ohio, Indiana, and Kentucky. Of these, Pennsylvania and Ohio had the greatest exceedances of their assurance limits.

State	**2013 SO_2 Emissions (tons)**	**Phase 2 Assurance Level (tons)**	**Excess SO_2 Emissions (tons)**
Pennsylvania	252,078	132,185	119,893
Ohio	281,986	167,843	114,143
Indiana	268,217	196,410	71,807
Kentucky	188,115	125,415	62,700

23. Several factors are expected to reduce SO_2 emissions in these four states (and others) in 2014 (and continuing into 2015). These factors include: (1) coal

[6] *See* http://www.fierceenergy.com/story/alliant-installing-air-quality-improvement-technology/2014-07-10.

unit retirements; (2) conversions of coal-fired units to natural gas; (3) flue gas desulfurization (scrubber) retrofits or upgrades for compliance with EPA's MATS and other air quality programs (such as the 1-hour SO2 National Ambient Air Quality Standards, etc.); and (4) dry sorbent injection (DSI) retrofits for compliance with the MATS Rule acid gas standard, which has some co-benefits in terms of reduced SO_2 emissions. I evaluated all of these factors and others (as discussed below) to determine if they would reduce SO_2 emissions in these four states to below their respective Phase 2 assurance levels. Each state is discussed in turn, beginning with Pennsylvania.

24. Affected sources in Pennsylvania exceeded their Phase 2 assurance level by 119,893 tons in 2013. However, based on a combination of pollution control retrofits and coal plant retirements, I believe that Pennsylvania can reduce its SO_2 emissions below the Phase 2 assurance level easily starting January 1, 2016 and most likely even starting January 1, 2015. The single largest reduction measure in the state is the construction of scrubbers at the Homer City plant in Indiana County, Pennsylvania. The Homer City units (1 and 2) were the largest emitters of SO_2 in the state in 2013. (Homer City was actually the largest emitter of SO_2 in the entire U.S. in 2013.) Reducing the plant's SO_2 rate to 0.2 lb/MMBtu (its permitted rate[7]) or to 0.15 lb/MMBtu (the rate achievable by the new scrubbers[8]) would

[7] The controlled SO_2 emission rate is the facility's permitted SO_2 emission rate from the Commonwealth of Pennsylvania, Department of Environmental Protection, Air Quality program Plan Approval revised May 14, 2013. The Plan Approval is to "allow the installation and temporary operation of dry flue gas desulfurization ('FGD') systems with fabric filters and associated support equipment for the control of SOx emissions from Unit 1 and 2 by NRG Homer City Services, LLC at the Homer City Generating Station located in Black Lick & Center Townships, Indiana County."

[8] The new scrubbers being installed at Homer City Units 1 and 2 are NIDS by Alstom—with demonstrated SO_2 reduction efficiency of 95%, which would result

eliminate between approximately 104,000 – 106,000 tons of SO_2 each year assuming average 2012/2013 heat inputs. As far the schedule for the installation of these two new scrubbers is concerned, based on a review of public declarations as well as financial filings by the plant operator, it is my opinion that they can commence operation at the end of 2014. This scrubber retrofit alone at Homer City Units 1 and 2 would substantially close the gap between the state's 2013 EGU emissions and its Phase 2 assurance level. In addition to the Homer City retrofit, there are several coal-fired generating units in the state that have been announced for retirement in 2014 (and 2015). Among the largest SO_2 emitting units in the state, I have identified six EGUs that are scheduled to retire by April 2015. Finally, I have examined operating performance of various units with scrubbers already installed and determined that many of these units are simply not operating their scrubbers to the levels that they have been designed for and/or actually operated in the past. Similar to the discussions relating to SCR in previous sections dealing with NOx emissions, I believe that significant additional SO_2 reductions can be readily achieved from many units in Pennsylvania just by fully operating scrubbers already in place. In aggregate, unit retirements, the Homer City retrofits, and full operation of existing scrubbers would eliminate over 185,000 tons of SO_2 emissions. This level of reduction would bring Pennsylvania's SO_2 emissions to well below its Phase 2 assurance level as well and its Phase 2 budget. And, this can be done starting January 1, 2015. With additional retirements in 2015 and as other remaining units add DSI or similar controls for anticipated, delayed MATS compliance starting in April 2016, additional co-benefit SO_2 reductions would make achieving the Phase 2 assurance level even easier starting January 1, 2016.

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in an emission rate of 0.15 lb/MMBtu, assuming that the plant continues to burn coal with input sulfur of approximately 3.0 lb/MMBtu, as it does presently.

25. Table 3 summarizes my analysis of the 27 largest SO_2 emitting EGUs in Pennsylvania. Together, these units accounted for 92% of power plant SO_2 emissions in 2013.

26. Affected sources in Ohio exceeded their Phase 2 assurance level by 114,143 tons in 2013. However, based on a combination of: (a) accounting for already-announced coal unit retirements (appropriately pro-rated); and (b) utilizing existing pollution controls (i.e., scrubbers) at their already-demonstrated levels within the last 5 years, I believe that Ohio can reduce its SO_2 emissions below its Phase 2 assurance level starting in 2015. My analysis, summarized in Table 4 shows that annual SO2 emissions levels can be reduced by 143,565 tons in 2015 from 2013 actual emitted levels, i.e., significantly more than needed to meet Ohio's assurance level.

27. Affected sources in Indiana exceeded their Phase 2 assurance level by 71,807 tons in 2013. Similar to the analysis I did for Ohio, substantial reductions of annual SO_2 emissions in 2015 can be obtained using a combination of: (a) already-announced coal unit retirements (appropriately pro-rated); and (b) utilization of existing pollution controls (i.e., scrubbers) at their already-demonstrated levels within the last 5 years. These approaches will provide roughly 64,833 tons of SO_2 reduction. Table 5 summarizes the details of this analysis.

28. Beyond the 64,833 tons of SO_2 reduction obtained above, roughly 6,974 tons of additional SO_2 reductions will be needed to meet the assurance level for Indiana in 2015. Some of the additional readily-available approaches that can be used to obtain these remaining reductions, individually or in combination, include: (a) running existing scrubbers for units already so equipped at their design efficiencies as opposed to just at the lower actual efficiencies in the last five years; (b) reducing the average input coal sulfur content by displacing high-sulfur coal with lower

sulfur coal at several units; and (c) dispatching lower emitting or cleaner sources in place of higher emitting generation.

29. As an example of the last strategy alone, all of the additional 6,794 tons of additional SO_2 reduction needed to meet the 2015 assurance level can be obtained if the capacity utilization of the high-emitting Rockport Units 1 and 2 (which emitted roughly 6.2 pound of SO_2 per MWh of generation in 2013) is reduced and the corresponding generation is obtained from Indiana's own installed base of approximately 5,810 MW of lower-emitting natural gas. This will require a modest increase in the capacity utilization (around 5% or less) of the natural gas fleet already installed in Indiana from its relatively low levels in 2012/2013 (around 17–29%). Thus, in combination, the Phase 2 assurance level for annual SO_2 can be readily met in 2015 in Indiana.

30. Affected sources in Kentucky exceeded their Phase 2 SO_2 assurance level by 62,700 tons in 2013. Similar to the analysis I did for Ohio and Indiana above, substantial reductions of annual SO_2 emissions in 2015 can be obtained using a combination of: (a) already-announced coal unit retirements (appropriately pro-rated); and (b) utilization of existing pollution controls (i.e., scrubbers) at their already-demonstrated levels within the last 5 years. These approaches will provide roughly 49,284 tons of SO_2 reduction. Table 6 summarizes the details of this analysis.

31. Beyond the 49,284 tons of SO_2 reduction outlined above, roughly 13,416 tons of additional SO_2 reductions will be needed to meet the assurance level for Kentucky in 2015. Some of the additional readily-available approaches that can be used, individually or in combination, to obtain these remaining reductions include: (a) running existing scrubbers for units already so equipped at their design efficiencies as opposed to just at the lower actual efficiencies in the last five years; (b) reducing the average input coal sulfur content by displacing high-sulfur coal

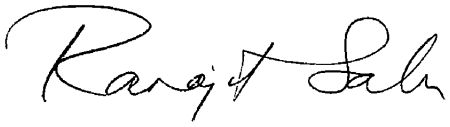
with lower sulfur coal at several units; and (c) dispatching lower-emitting or cleaner sources in place of higher-emitting generation.

32. As an example of the last strategy alone, all of the additional 13,416 tons of additional SO_2 reduction needed to meet the 2015 annual assurance level can be obtained if the capacity utilization of the high-emitting Paradise Units 1 and 2 (both of which are already scheduled to retire in 2016) is reduced and the corresponding generation is obtained from Kentucky's own installed base of approximately 6,166 MW of lower-emitting natural gas. This will require a modest increase in the capacity utilization (around 11%) of the natural gas fleet already installed in Kentucky from its relatively low levels in 2012/2013 (around 3 to 5.5%). Thus, in combination, the Phase 2 assurance level for annual SO_2 can be readily met in 2015 in Kentucky.

Clean Air Interstate Rule (CAIR) SO_2 Allowances

33. Finally, I note that the supply of CAIR SO_2 allowances is so great relative to their demand that the allowances are nearly valueless. As a consequence, the CAIR SO_2 trading program no longer meaningfully constrains SO_2 emissions.

SO DECLARED:



Ranajit Sahu

DATED: July 11, 2014

TABLE 1

Top 25 highest emitting units in Missouri (based on ozone season NOx tons) in 2013 (Note that these same units were the 25 highest emitting units in 2012)

Facility Name	Unit ID	SCR Controls	2013 NOx Emissions (tons)	2013 Heat Input (MMBtu)	2013 Avg. NOx Rate (lb/ MMBtu)	Avg. 2012-2013 Heat Input	Avg. of 3 lowest OS NOx rates (lb/ MMBtu)	Assumed NOx rate* (lb/ MMBtu)	New NOx Emissions Estimate (assuming avg 2012/2013 Heat Input)	Reduction in NOx Emissions with NOx Controls in Operation and Retirements (tons)	Improvement assumed?
New Madrid Power Plant	2	Yes	4,328	17,278,766	0.50	16,769,657	0.09	0.09	771	3,557	Yes
New Madrid Power Plant	1	Yes	4,126	13,447,549	0.61	15,742,672	0.09	0.09	718	3,408	Yes
Thomas Hill Energy Center	MB2	Yes	2,430	7,926,738	0.61	8,660,415	0.33	0.33	1,448	982	Yes
Thomas Hill Energy Center	MB1	Yes	1,812	6,168,477	0.59	6,587,779	0.09	0.09	307	1,504	Yes
Thomas Hill Energy Center	MB3	Yes	1,786	23,130,695	0.15	20,823,789	0.08	0.08	864	922	Yes
Sioux	1	No	1,523	12,465,155	0.24	11,787,204	0.23	0.24	1,440	83	No
Sioux	2	No	1,269	10,693,714	0.24	9,963,958	0.23	0.24	1,182	87	No
Asbury	1	Yes	960	7,039,789	0.27	6,020,405	0.14	0.14	410	549	Yes
Labadie	2	No	864	18,145,210	0.10	15,526,209	0.10	0.10	739	125	No
Chamois Power Plant	2	No	777	1,664,391	0.93	1,550,365	0.85	-	-	777	N/A**
Labadie	3	No	774	16,466,559	0.09	16,974,096	0.11	0.09	798	(24)	No
Labadie	1	No	768	17,032,904	0.09	16,972,444	0.10	0.09	765	3	No
Labadie	4	No	763	17,099,567	0.09	18,445,063	0.10	0.09	823	(60)	No
Lake Road	6	No	728	2,134,276	0.68	2,251,031	0.64	0.68	768	(40)	No
Iatan	2	Yes	718	27,389,868	0.05	26,124,538	0.05	0.05	685	33	No
Sibley	3	Yes	715	8,780,392	0.16	8,616,507	0.10	0.10	440	275	Yes
Rush Island	1	No	651	15,373,057	0.08	16,274,205	0.09	0.08	689	(38)	No
Montrose	1	No	646	3,940,867	0.33	4,423,104	0.33	0.33	725	(79)	No
Rush Island	2	No	645	15,871,549	0.08	14,747,902	0.08	0.08	600	46	No
Meramec	4	No	585	6,990,800	0.17	7,614,565	0.18	0.17	637	(52)	No
Iatan	1	Yes	576	18,363,316	0.06	21,194,112	0.07	0.06	664	(89)	No
Hawthorn	5A	Yes	546	14,790,981	0.07	16,467,623	0.07	0.07	608	(62)	No
Sikeston	1	No	463	8,900,968	0.10	8,453,941	0.21	0.10	440	23	No
Meramec	3	No	462	5,535,373	0.17	6,132,711	0.17	0.17	512	(50)	No
Montrose	2	No	384	4,822,372	0.16	4,248,402	0.26	0.16	338	46	No
TOTAL										11,926	

* For units with SCR installed, the average of their three lowest ozone-season NOx emission rates from 2008-2012, or their 2013 ozone-season NOx rate, whichever is lower. All other units are held constant at their 2013 ozone-season NOx rates.

** Retired in September 2013

TABLE 2

Top 27 highest emitting units in Missouri (based on annual NOx tons) in 2013 (Note that these same units were the 27 highest emitting units in 2012)

Facility Name	Unit ID	SCR Controls	2013 NOx Emissions (tons)	2013 Heat Input (MMBtu)	2013 Avg. NOx Rate (lb/ MMBtu)	Avg. 2012-2013 Heat Input	Avg. of 3 Lowest Annual NOx rates	Assumed NOx rate* (lb/ MMBtu)	New NOx Emissions Estimate (assuming avg 2012/2013 Heat Input)	Reduction in NOx Emissions with NOx Controls in Operation and Retirements (tons)	Improvement assumed?
New Madrid Power Plant	1	Yes	12,071	38,581,042	0.63	38,247,530	0.17	0.17	3,294	8,778	Yes
New Madrid Power Plant	2	Yes	10,256	38,683,085	0.53	37,504,657	0.12	0.12	2,216	8,040	Yes
Thomas Hill Energy Center	MB2	Yes	7,271	21,282,561	0.68	19,064,219	0.33	0.33	3,103	4,168	Yes
Thomas Hill Energy Center	MB1	Yes	4,562	14,889,551	0.61	14,330,448	0.12	0.12	827	3,735	Yes
Thomas Hill Energy Center	MB3	Yes	3,994	48,341,695	0.17	46,174,768	0.10	0.10	2,402	1,592	Yes
Sioux	1	No	3,080	25,045,245	0.25	23,909,957	0.26	0.25	2,940	140	No
Sioux	2	No	2,924	24,262,185	0.24	24,337,736	0.24	0.24	2,934	(9)	No
Asbury	1	Yes	2,290	15,933,028	0.29	14,865,750	0.14	0.14	1,030	1,260	Yes
Labadie	1	No	1,921	41,394,242	0.09	42,287,846	0.10	0.09	1,962	(41)	No
Labadie	2	No	1,904	38,948,252	0.10	35,846,610	0.11	0.10	1,752	152	No
Labadie	4	No	1,831	41,543,426	0.09	38,830,433	0.10	0.09	1,712	120	No
Labadie	3	No	1,819	37,973,504	0.10	36,926,971	0.11	0.10	1,769	50	No
Sibley	3	Yes	1,809	20,730,850	0.17	20,107,060	0.12	0.12	1,205	604	Yes
Lake Road	6	No	1,723	5,284,913	0.65	4,702,472	0.66	0.65	1,533	190	No
Iatan	1	Yes	1,554	46,876,303	0.07	50,523,350	0.07	0.07	1,675	(121)	No
Rush Island	2	No	1,542	37,860,229	0.08	36,438,901	0.08	0.08	1,484	58	No
Rush Island	1	No	1,525	36,480,883	0.08	37,118,252	0.08	0.08	1,552	(27)	No
Iatan	2	Yes	1,448	56,358,120	0.05	59,306,736	0.05	0.05	1,483	(35)	No
Chamois Power Plant	2	No	1,442	3,067,657	0.94	3,158,608	0.87	-	-	1,442	N/A**
Hawthorn	5A	Yes	1,378	37,625,680	0.07	37,678,417	0.07	0.07	1,358	20	No
Montrose	1	No	1,281	7,833,294	0.33	7,746,636	0.33	0.33	1,267	14	No
Sikeston	1	No	1,264	19,103,660	0.13	18,013,947	0.21	0.13	1,192	72	No
Meramec	4	No	948	11,401,953	0.17	14,778,945	0.18	0.17	1,229	(281)	No
Montrose	2	No	919	11,780,332	0.16	9,218,975	0.29	0.16	719	200	No
Montrose	3	No	882	11,317,127	0.16	8,876,660	0.29	0.16	692	190	No
James River	5	No	596	4,973,917	0.24	4,654,945	0.19	0.24	557	38	No
Meramec	3	No	541	6,440,098	0.17	8,928,697	0.17	0.17	750	(209)	No
Total										30,310	

* For units with SCR installed, the average of their three lowest annual NOx emission rates from 2008-2012, or their 2013 annual NOx rate, whichever is lower. All other units are held constant at their 2013 annual NOx rates.

TABLE 3

Top 27 highest emitting units in Pennsylvania (based on annual SO_2 tons) in 2013

Facility Name	Unit ID	FGD Controls	2013 SO2 Emissions (tons)	2013 Heat Input (MMBtu)	2013 Avg. SO2 Rate (lb/MMBtu)	Avg. 2012-2013 Heat Input (MMBtu)	Avg. of 3 Lowest Annual SO2 rates	Assumed SO2 rate (lb/MMBtu)	New SO_2 Emissions Estimate (assuming avg 2012/2013 Heat Input)	Reduction in SO2 Emissions with SO2 Controls in Operation and Retirements (tons)	Notes
Homer City	1	No	55,726	36,957,407	3.02	32,973,144	2.85	0.15	2,473	53,253	FGD expected Q3 2015.
Homer City	2	No	55,451	37,618,511	2.95	36,422,221	2.83	0.15	2,732	52,719	FGD expected Q3 2015.
Keystone	1	Yes	14,600	58,508,622	0.50	54,920,457	0.71	0.06	1,648	12,952	
Keystone	2	Yes	11,797	62,098,517	0.38	53,223,278	0.66	0.06	1,597	10,201	
Bruce Mansfield	3	Yes	10,830	61,694,411	0.35	61,584,397	0.23	0.15	4,619	6,211	Scrubber upgrades for MATS compliance
Shawville	3	No	9,259	6,258,873	2.96	5,394,371	2.89	-	-	9,259	Retiring by April 2015
Montour	2	Yes	6,440	33,116,889	0.39	35,992,568	0.41	0.08	1,440	5,000	
Brunner Island	3	Yes	6,277	34,347,206	0.37	32,494,479	0.39	0.23	3,737	2,540	Installing sorbent injection system for MATS compliance
Shawville	4	No	6,164	4,130,558	2.98	4,173,337	2.88	-	-	6,164	Retiring by April 2015
Montour	1	Yes	5,996	34,339,654	0.35	36,193,047	0.39	0.08	1,448	4,549	
Shawville	2	No	5,431	3,639,389	2.98	3,298,748	2.93	-	-	5,431	Retiring by April 2015
Shawville	1	No	4,815	3,294,155	2.92	2,900,103	2.86	-	-	4,815	Retiring by April 2015
Conemaugh	1	Yes	4,131	63,446,309	0.13	57,263,201	0.12	0.12	3,325	805	Scrubber upgrades for MATS compliance
Bruce Mansfield	1	Yes	3,437	60,073,633	0.11	57,376,073	0.14	0.10	2,869	568	Scrubber upgrades for MATS compliance
Brunner Island	2	Yes	3,101	15,663,810	0.40	17,059,870	0.39	0.23	1,962	1,139	Installing sorbent injection system for MATS compliance
Homer City	3	Yes	3,069	33,557,512	0.18	33,608,012	0.18	0.06	1,008	2,061	Installing sorbent injection system for MATS compliance
Bruce Mansfield	2	Yes	2,899	49,042,146	0.12	53,352,540	0.18	0.12	3,154	(255)	Scrubber upgrades for MATS compliance
Brunner Island	1	Yes	2,798	15,916,093	0.35	12,883,779	0.39	0.23	1,482	1,317	Installing sorbent injection system for MATS compliance
Colver Power Project	AAB01	Yes	2,756	10,727,086	0.51	10,633,404	0.34	0.34	1,825	931	
New Castle	5	No	2,348	1,923,909	2.44	1,842,756	2.17	-	-	2,348	Retiring by April 2016 (converting to NG).
Conemaugh	2	Yes	2,278	49,514,850	0.09	51,697,953	0.12	0.09	2,378	(100)	Scrubber upgrades for MATS compliance
Seward	2	Yes	2,251	10,491,381	0.43	11,344,504	0.40	0.40	2,294	(44)	
Ebensburg Power Company	31	Yes	1,935	6,107,538	0.63	6,279,561	0.40	0.40	1,265	671	
Seward	1	Yes	1,829	8,692,115	0.42	8,654,342	0.40	0.40	1,733	95	
St. Nicholas Cogeneration Project	1	Yes	1,823	10,248,638	0.36	10,748,759	0.23	0.23	1,233	590	
Cheswick	1	Yes	1,686	29,469,741	0.11	27,292,268	0.70	0.05	682	1,004	
New Castle	4	No	1,646	1,387,899	2.37	1,318,268	2.08	-	-	1,646	Retiring by April 2016 at latest (converting to NG).
TOTAL										185,867	

TABLE 4

Top 27 highest emitting units in Ohio (based on annual SO_2 tons) in 2013

Facility Name	Unit ID	FGD Controls	2013 SO2 Emissions (tons)	2013 Heat Input (MMBtu)	2013 Avg. SO2 Rate (lb/ MMBtu)	Avg. 2012-2013 Heat Input (MMBtu)	2013 Avg. SO2 Rate (lb/ MMBtu)	Avg. of 3 Lowest Annual SO_2 rates	Assumed SO_2 rate (lb/ MMBtu)	New SO_2 Emissions Estimate (assuming avg 2012/2013 Heat Input) 2015	Reduction in SO_2 Emissions with SO_2 Controls in Operation and Retirements (tons)	Retiring by?
Avon Lake Power Plant	12	No	39,562	26,371,180	3.00	24,866,393	3.00	2.28	2.28	28,337	11,225	April 2016 (converting to NG)
Walter C Beckjord Generating Station	6	No	31,029	14,813,208	4.19	17,156,343	4.19	2.35	-	-	31,029	January 1, 2015
Miami Fort Generating Station	6	No	19,958	11,142,736	3.58	9,958,678	3.58	3.74	-	9,979	9,979	June 1, 2015.
Walter C Beckjord Generating Station	5	No	19,325	8,726,639	4.43	8,704,270	4.43	2.05	-	-	19,325	January 1, 2015
W H Zimmer Generating Station	1	Yes	18,457	89,712,238	0.41	67,597,388	0.41	0.41	0.36	12,286	6,171	
Muskingum River	3	No	16,244	5,296,176	6.13	5,165,661	6.13	4.37	-	8,122	8,122	June 1, 2015
Gen J M Gavin	1	Yes	14,719	81,308,610	0.36	85,274,811	0.36	0.30	0.29	12,407	2,312	
Gen J M Gavin	2	Yes	13,133	68,929,336	0.38	76,562,543	0.38	0.29	0.26	9,835	3,298	
Muskingum River	5	No	12,919	15,564,937	1.66	11,755,074	1.66	1.50	-	4,306	8,613	Spring 2015.
Killen Station	2	Yes	7,885	37,332,118	0.42	36,314,113	0.42	0.14	0.05	962	6,923	
Miami Fort Generating Station	8	Yes	6,704	34,477,867	0.39	32,960,710	0.39	0.15	0.14	2,307	4,397	
Ashtabula	7	No	6,664	3,539,938	3.76	3,456,714	3.76	0.68	-	2,221	4,442	Spring 2015.
Miami Fort Generating Station	7	Yes	5,182	38,614,089	0.27	39,652,907	0.27	0.15	0.14	2,776	2,406	
Cardinal	1	Yes	4,636	33,440,056	0.28	30,020,546	0.28	0.20	0.16	2,402	2,234	
Eastlake	3	No	4,370	2,147,863	4.07	3,296,217	4.07	1.18	-	-	4,370	September 2014
Cardinal	2	Yes	3,993	34,452,060	0.23	36,059,023	0.23	0.18	0.17	3,065	928	
Eastlake	2	No	3,953	1,981,929	3.99	3,061,560	3.99	1.19	-	-	3,953	September 2014
Muskingum River	4	No	3,861	1,246,847	6.19	2,174,435	6.19	4.38	-	1,930	1,930	June 1, 2015
J M Stuart	1	Yes	3,655	34,428,852	0.21	33,387,849	0.21	0.15	0.10	1,669	1,986	
Eastlake	1	No	3,259	1,608,339	4.05	3,273,300	4.05	1.09	-	-	3,259	September 2014
Conesville	5	Yes	3,106	24,912,331	0.25	21,089,419	0.25	0.16	0.16	1,685	1,421	
J M Stuart	4	Yes	2,959	35,092,561	0.17	34,382,872	0.17	0.15	0.13	2,320	638	
Bay Shore	1	Yes	2,827	15,985,918	0.35	14,890,429	0.35	0.33	0.30	2,237	590	
J M Stuart	3	Yes	2,806	35,729,621	0.16	28,080,627	0.16	0.11	0.08	1,123	1,683	
Kyger Creek	2	Yes	2,293	11,774,814	0.39	12,134,482	0.39	1.27	0.30	1,850	442	
Kyger Creek	1	Yes	2,190	9,115,286	0.48	8,803,559	0.48	1.23	0.22	982	1,208	
J M Stuart	2	Yes	2,122	29,743,253	0.14	32,010,317	0.14	0.13	0.09	1,440	681	
Total			257,808							114,243	143,565	

TABLE 5

Top 27 highest emitting units in Indiana (based on annual SO_2 tons) in 2013

Facility Name	Unit ID	FGD Controls	2013 SO_2 Emissions (tons)	2013 Heat Input (MMBtu)	2013 Avg. SO2 Rate (lb/ MMBtu)	Avg. 2012-2013 Heat Input (MMBtu)	2013 Avg. SO2 Rate (lb/ MMBtu)	Avg. of 3 Lowest Annual SO_2 rates	Assumed SO_2 rate (lb/ MMBtu)	New SO_2 Emissions Estimate (assuming avg 2012/2013 Heat Input) for 2015	Reduction in SO_2 Emissions with SO_2 Controls in Operation and Retirements (tons)	Notes
Rockport	MB1	No	30,839	92,775,612	0.66	94,042,378	0.66	0.62	0.62	28,959	1,880	Installing DSI
Rockport	MB2	No	20,797	61,477,013	0.68	76,357,380	0.68	0.61	0.61	23,396	(2,598)	Installing DSI
Wabash River Gen Station	6	Yes	17,868	11,598,992	3.08	11,072,689	3.08	2.87	2.87	15,916	1,951	Retiring by April 2016 (may convert to NG)
IPL - Petersburg Generating Station	1	Yes	14,395	17,407,868	1.65	16,438,097	1.65	0.22	0.06	509	13,886	
IPL - Harding Street Station (EW Stout)	50	Yes	13,324	6,770,399	3.94	6,406,189	3.94	2.99	2.99	9,562	3,762	Retiring by April 2016 (converting to NG)
IPL - Harding Street Station (EW Stout)	60	No	12,603	6,423,947	3.92	6,163,648	3.92	3.01	3.01	9,276	3,327	Retiring by April 2016 (converting to NG)
Michigan City Generating Station	12	Yes	10,429	21,341,123	0.98	22,184,882	0.98	0.88	0.88	9,769	660	Installing dry FGD by April 2016
Tanners Creek	U4	Yes	10,346	14,188,929	1.46	16,554,225	1.46	1.33	-	5,173	5,173	Retiring by June 1, 2015 (Therefore 0.5 * 2013 tons)
Gibson	5	No	9,887	30,507,322	0.65	31,793,623	0.65	0.67	0.56	8,899	987	
Station	15	Yes	8,401	27,201,127	0.62	27,493,555	0.62	0.55	0.20	2,749	5,651	Installing wet FGD, online before April 2015.
IPL - Petersburg Generating Station	2	No	8,129	19,955,581	0.81	21,883,297	0.81	0.13	0.08	855	7,275	Installing sorbent injection system for MATS compliance
IPL - Petersburg Generating Station	3	No	6,383	37,878,497	0.34	32,439,655	0.34	0.24	0.18	2,940	3,442	Installing sorbent injection system for MATS compliance
Station	14	Yes	6,193	18,188,583	0.68	15,521,086	0.68	0.82	0.79	6,165	28	Wet FGD online in 2013
Frank E Ratts	1SG1	Yes	5,376	3,695,338	2.91	3,300,934	2.91	2.50	-	1,792	3,584	Retiring by April 2015 (Therefore 0.667 * 2013 tons)
Clifty Creek	6	Yes	5,069	9,225,668	1.10	9,672,817	1.10	1.62	0.20	967	4,102	Wet FGD online in 2013
Clifty Creek	2	Yes	4,923	12,925,526	0.76	10,696,303	0.76	1.60	0.20	1,070	3,854	Wet FGD online in 2013
Frank E Ratts	2SG1	Yes	4,876	3,361,459	2.90	2,880,609	2.90	2.53	-	1,625	3,251	Retiring by April 2015 (Therefore 0.667 * 2013 tons)
IPL - Petersburg Generating Station	4	Yes	4,848	33,412,698	0.29	33,428,613	0.29	0.66	0.29	4,847	1	Installing sorbent injection system for MATS compliance
A B Brown Generating Station	1	Yes	4,457	14,006,565	0.64	13,350,937	0.64	0.60	0.55	3,703	754	
Clifty Creek	5	No	4,369	11,092,493	0.79	10,578,864	0.79	1.62	0.79	4,167	202	
Gibson	4	Yes	3,647	35,045,890	0.21	33,803,091	0.21	0.17	0.16	2,774	873	
Wabash River Gen Station	3	Yes	3,493	2,232,175	3.13	1,968,492	3.13	2.99	-	3,493	-	Retiring by April 2016 (may convert to NG)
IPL - Eagle Valley Generating Station	6	Yes	3,221	3,074,127	2.10	2,388,259	2.10	2.04	-	3,221	-	Retiring by April 2016 (replaced with NGCC)
Wabash River Gen Station	4	Yes	3,203	2,032,168	3.15	2,140,058	3.15	2.94	-	3,203	-	Retiring by April 2016 (may convert to NG)
Tanners Creek	U3	Yes	3,151	5,866,488	1.07	6,264,927	1.07	0.98	-	1,575	1,575	Retiring by June 1, 2015 (Therefore 0.5 * 2013 tons)
Wabash River Gen Station	2	Yes	3,022	1,902,979	3.18	2,013,724	3.18	1.95	-	3,022	-	Retiring by April 2016 (may convert to NG)
Gibson	1	No	2,782	40,748,235	0.14	39,041,311	0.14	0.10	0.08	1,570	1,212	
Total											64,833	

TABLE 6

Top 27 highest emitting units in Kentucky (based on annual SO_2 tons) in 2013

Facility Name	Unit ID	FGD Controls	2013 SO_2 Emissions (tons)	2013 Heat Input (MMBtu)	2013 Avg. SO_2 Rate (lb/ MMBtu)	Avg. 2012-2013 Heat Input (MMBtu)	Avg. of 3 Lowest Annual SO_2 rates	Assumed SO2 rate (lb/ MMBtu)	New SO_2 Emissions Estimate (assuming avg 2012/2013 Heat Input) in 2015	Reduction in SO_2 Emissions with SO_2 Controls in Operation and Retirements (tons)	Notes
Green River	5	No	12,121	6,317,700	3.84	6,291,901	3.94	-	-	12,121	Retiring in early 2015
Big Sandy	BSU2	No	11,711	15,878,773	1.48	17,109,336	1.37	1.37	5,869	5,842	Retiring by June 1, 2015 (45 day MATS extension)
Paradise	1	Yes	9,623	44,570,885	0.43	47,516,175	0.59	-	9,623	-	Retiring by April 2016 (1 year MATS extension) [Retire Early = 2015]
Mill Creek	4	Yes	9,361	28,093,646	0.67	26,056,345	0.50	0.45	5,840	3,522	FGD retrofit (1 year MATS extension)
Paradise	2	Yes	9,202	46,169,365	0.40	45,489,306	0.64	-	9,202	-	Retiring by April 2016 (1 year MATS extension) [Retire Early = 2015]
Mill Creek	3	Yes	8,872	22,555,009	0.79	24,833,038	0.62	0.58	7,190	1,681	FGD retrofit (1 year MATS extension)
Green River	4	No	7,877	4,188,322	3.76	3,872,658	3.96	-	-	7,877	Retiring in early 2015
D B Wilson	W1	Yes	7,607	32,722,466	0.46	32,689,302	0.46	0.44	7,192	415	May upgrade existing or install new DSI (MATS extension pending)
Big Sandy	BSU1	No	7,021	9,562,887	1.47	8,546,840	1.38	1.38	5,903	1,119	Retiring by April 2016 (NG conversion, MATS extension)
Mill Creek	2	Yes	6,534	19,162,163	0.68	17,225,196	0.46	0.44	3,772	2,762	FGD retrofit (1 year MATS extension)
Ghent	2	Yes	6,323	36,426,543	0.35	33,145,980	0.27	0.24	3,922	2,402	
Elmer Smith	2	Yes	5,414	20,350,020	0.53	18,482,977	0.38	0.30	2,732	2,682	Installing sorbent injection system for MATS compliance
Ghent	3	Yes	4,967	34,725,149	0.29	33,817,921	0.21	0.19	3,132	1,835	
Mill Creek	1	Yes	4,680	14,609,365	0.64	16,952,982	0.43	0.38	3,248	1,432	FGD retrofit (1 year MATS extension)
Coleman	C3	Yes	3,863	12,591,557	0.61	12,599,878	0.19	-	-	3,863	Installing DSI for MATS compliance. Idled for 2 years in May 2014.
Shawnee	5	No	3,249	9,020,451	0.72	9,108,901	0.68	0.68	3,249	-	
Shawnee	8	No	3,189	8,974,833	0.71	8,891,739	0.68	0.68	3,189	-	
Shawnee	4	No	3,158	8,736,818	0.72	8,229,272	0.68	0.68	3,158	-	
Shawnee	1	No	3,095	8,599,786	0.72	7,508,877	0.68	0.68	3,095	-	
Shawnee	3	No	3,056	8,483,257	0.72	8,126,894	0.68	0.68	3,056	-	
Shawnee	6	No	3,000	8,480,477	0.71	8,497,741	0.67	0.67	3,000	-	
Shawnee	7	No	2,884	8,021,275	0.72	8,744,419	0.67	0.67	2,884	-	
Shawnee	9	No	2,847	8,038,678	0.71	8,500,597	0.67	0.67	2,847	-	
John S. Cooper	1	No	2,812	4,106,883	1.37	4,879,573	1.85	1.37	2,812	-	Routing exhaust to dry scrubber on Unit 2 by April 2016 (assumed unit 2 rate)
Shawnee	2	No	2,731	7,557,731	0.72	8,137,156	0.68	0.68	2,731	-	
R D Green	G1	Yes	2,702	18,521,436	0.29	18,133,522	0.15	0.12	1,110	1,592	
Paradise	3	Yes	2,698	38,271,742	0.14	51,273,530	0.12	0.10	2,559	140	
Total										49,284	

EXHIBIT 1

RANAJIT (RON) SAHU, Ph.D, QEP, CEM (Nevada)

CONSULTANT, ENVIRONMENTAL AND ENERGY ISSUES

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EXPERIENCE SUMMARY

Dr. Sahu has over twenty three years of experience in the fields of environmental, mechanical, and chemical engineering including: program and project management services; design and specification of pollution control equipment for a wide range of emissions sources; soils and groundwater remediation including landfills as remedy; combustion engineering evaluations; energy studies; multimedia environmental regulatory compliance (involving statutes and regulations such as the Federal CAA and its Amendments, Clean Water Act, TSCA, RCRA, CERCLA, SARA, OSHA, NEPA as well as various related state statutes); transportation air quality impact analysis; multimedia compliance audits; multimedia permitting (including air quality NSR/PSD permitting, Title V permitting, NPDES permitting for industrial and storm water discharges, RCRA permitting, etc.), multimedia/multi-pathway human health risk assessments for toxics; air dispersion modeling; and regulatory strategy development and support including negotiation of consent agreements and orders.

Specifically, over the last 20+ years, Dr. Sahu has consulted on several municipal landfill related projects addressing landfill gas generation, landfill gas collection, and the treatment/disposal/control of such gases in combustion equipment such as engines, turbines, and flares. In particular, Dr. Sahu has executed numerous projects relating to flare emissions from sources such as landfills as well as refineries and chemical plants. He has served as a peer-reviewer for EPA in relation to flare combustion efficiency, flare destruction efficiency, and flaring emissions.

He has over twenty one years of project management experience and has successfully managed and executed numerous projects in this time period. This includes basic and applied research projects, design projects, regulatory compliance projects, permitting projects, energy studies, risk assessment projects, and projects involving the communication of environmental data and information to the public. Notably, he has successfully managed a complex soils and groundwater remediation project with a value of over $140 million involving soils characterization, development and implementation of the remediation strategy including construction of a CAMU/landfill and associated groundwater monitoring, regulatory and public interactions and other challenges.

He has provided consulting services to numerous private sector, public sector and public interest group clients. His major clients over the past twenty three years include various steel mills, petroleum refineries, cement companies, aerospace companies, power generation facilities, lawn and garden equipment

manufacturers, spa manufacturers, chemical distribution facilities, and various entities in the public sector including EPA, the US Dept. of Justice, California DTSC, various municipalities, etc.). Dr. Sahu has performed projects in over 44 states, numerous local jurisdictions and internationally.

In addition to consulting, Dr. Sahu has taught numerous courses in several Southern California universities including UCLA (air pollution), UC Riverside (air pollution, process hazard analysis), and Loyola Marymount University (air pollution, risk assessment, hazardous waste management) for the past seventeen years. In this time period he has also taught at Caltech, his alma mater (various engineering courses), at the University of Southern California (air pollution controls) and at California State University, Fullerton (transportation and air quality).

Dr. Sahu has provided and continues to provide expert witness services in a number of environmental areas discussed above in both state and Federal courts as well as before administrative bodies.

EXPERIENCE RECORD

2000-present **Independent Consultant.** Providing a variety of private sector (industrial companies, land development companies, law firms, etc.) public sector (such as the US Department of Justice) and public interest group clients with project management, air quality consulting, waste remediation and management consulting, as well as regulatory and engineering support consulting services.

1995-2000 Parsons ES, **Associate, Senior Project Manager and Department Manager for** Air Quality/Geosciences/Hazardous Waste Groups, Pasadena. Responsible for the management of a group of approximately 24 air quality and environmental professionals, 15 geoscience, and 10 hazardous waste professionals providing full-service consulting, project management, regulatory compliance and A/E design assistance in all areas.

Parsons ES, **Manager for Air Source Testing Services**. Responsible for the management of 8 individuals in the area of air source testing and air regulatory permitting projects located in Bakersfield, California.

1992-1995 Engineering-Science, Inc. **Principal Engineer and Senior Project Manager** in the air quality department. Responsibilities included multimedia regulatory compliance and permitting (including hazardous and nuclear materials), air pollution engineering (emissions from stationary and mobile sources, control of criteria and air toxics, dispersion modeling, risk assessment, visibility analysis, odor analysis), supervisory functions and project management.

1990-1992 Engineering-Science, Inc. **Principal Engineer and Project Manager** in the air quality department. Responsibilities included permitting, tracking regulatory issues, technical analysis, and supervisory functions on numerous air, water, and hazardous waste projects. Responsibilities also include client and agency interfacing, project cost and schedule control, and reporting to internal and external upper management regarding project status.

1989-1990 Kinetics Technology International, Corp. **Development Engineer.** Involved in thermal engineering R&D and project work related to low-NOx ceramic radiant burners, fired heater NOx reduction, SCR design, and fired heater retrofitting.

1988-1989 Heat Transfer Research, Inc. **Research Engineer**. Involved in the design of fired heaters, heat exchangers, air coolers, and other non-fired equipment. Also did research in the area of heat exchanger tube vibrations.

EDUCATION

1984-1988 Ph.D., Mechanical Engineering, California Institute of Technology (Caltech), Pasadena, CA.

1984 M. S., Mechanical Engineering, Caltech, Pasadena, CA.

1978-1983 B. Tech (Honors), Mechanical Engineering, Indian Institute of Technology (IIT) Kharagpur, India

TEACHING EXPERIENCE

Caltech

"Thermodynamics," Teaching Assistant, California Institute of Technology, 1983, 1987.

"Air Pollution Control," Teaching Assistant, California Institute of Technology, 1985.

"Caltech Secondary and High School Saturday Program," - taught various mathematics (algebra through calculus) and science (physics and chemistry) courses to high school students, 1983-1989.

"Heat Transfer," - taught this course in the Fall and Winter terms of 1994-1995 in the Division of Engineering and Applied Science.

“Thermodynamics and Heat Transfer,” Fall and Winter Terms of 1996-1997.

U.C. Riverside, Extension

"Toxic and Hazardous Air Contaminants," University of California Extension Program, Riverside, California. Various years since 1992.

"Prevention and Management of Accidental Air Emissions," University of California Extension Program, Riverside, California. Various years since 1992.

"Air Pollution Control Systems and Strategies," University of California Extension Program, Riverside, California, Summer 1992-93, Summer 1993-1994.

"Air Pollution Calculations," University of California Extension Program, Riverside, California, Fall 1993-94, Winter 1993-94, Fall 1994-95.

"Process Safety Management," University of California Extension Program, Riverside, California. Various years since 1992-2010.

"Process Safety Management," University of California Extension Program, Riverside, California, at SCAQMD, Spring 1993-94.

"Advanced Hazard Analysis - A Special Course for LEPCs," University of California Extension Program, Riverside, California, taught at San Diego, California, Spring 1993-1994.

"Advanced Hazardous Waste Management" University of California Extension Program, Riverside, California. 2005.

Loyola Marymount University

"Fundamentals of Air Pollution - Regulations, Controls and Engineering," Loyola Marymount University, Dept. of Civil Engineering. Various years since 1993.

"Air Pollution Control," Loyola Marymount University, Dept. of Civil Engineering, Fall 1994.

"Environmental Risk Assessment," Loyola Marymount University, Dept. of Civil Engineering. Various years since 1998.

"Hazardous Waste Remediation" Loyola Marymount University, Dept. of Civil Engineering. Various years since 2006.

University of Southern California

"Air Pollution Controls," University of Southern California, Dept. of Civil Engineering, Fall 1993, Fall 1994.

"Air Pollution Fundamentals," University of Southern California, Dept. of Civil Engineering, Winter 1994.

University of California, Los Angeles

"Air Pollution Fundamentals," University of California, Los Angeles, Dept. of Civil and Environmental Engineering, Spring 1994, Spring 1999, Spring 2000, Spring 2003, Spring 2006, Spring 2007, Spring 2008, Spring 2009.

International Programs

"Environmental Planning and Management," 5 week program for visiting Chinese delegation, 1994.

"Environmental Planning and Management," 1 day program for visiting Russian delegation, 1995.

"Air Pollution Planning and Management," IEP, UCR, Spring 1996.

"Environmental Issues and Air Pollution," IEP, UCR, October 1996.

PROFESSIONAL AFFILIATIONS AND HONORS

President of India Gold Medal, IIT Kharagpur, India, 1983.

Member of the Alternatives Assessment Committee of the Grand Canyon Visibility Transport Commission, established by the Clean Air Act Amendments of 1990, 1992-present.

American Society of Mechanical Engineers: Los Angeles Section Executive Committee, Heat Transfer Division, and Fuels and Combustion Technology Division, 1987-present.

Air and Waste Management Association, West Coast Section, 1989-present.

PROFESSIONAL CERTIFICATIONS

EIT, California (# XE088305), 1993.

REA I, California (#07438), 2000.

Certified Permitting Professional, South Coast AQMD (#C8320), since 1993.

QEP, Institute of Professional Environmental Practice, since 2000.

CEM, State of Nevada (#EM-1699). Expiration 10/07/2011.

PUBLICATIONS (PARTIAL LIST)

"Physical Properties and Oxidation Rates of Chars from Bituminous Coals," with Y.A. Levendis, R.C. Flagan and G.R. Gavalas, *Fuel*, **67**, 275-283 (1988).

"Char Combustion: Measurement and Analysis of Particle Temperature Histories," with R.C. Flagan, G.R. Gavalas and P.S. Northrop, *Comb. Sci. Tech.* **60**, 215-230 (1988).

"On the Combustion of Bituminous Coal Chars," PhD Thesis, California Institute of Technology (1988).

"Optical Pyrometry: A Powerful Tool for Coal Combustion Diagnostics," *J. Coal Quality*, **8**, 17-22 (1989).

"Post-Ignition Transients in the Combustion of Single Char Particles," with Y.A. Levendis, R.C.Flagan and G.R. Gavalas, *Fuel*, **68**, 849-855 (1989).

"A Model for Single Particle Combustion of Bituminous Coal Char." Proc. ASME National Heat Transfer Conference, Philadelphia, **HTD-Vol. 106**, 505-513 (1989).

"Discrete Simulation of Cenospheric Coal-Char Combustion," with R.C. Flagan and G.R.Gavalas, *Combust. Flame*, **77**, 337-346 (1989).

"Particle Measurements in Coal Combustion," with R.C. Flagan, in "**Combustion Measurements**" (ed. N. Chigier), Hemisphere Publishing Corp. (1991).

"Cross Linking in Pore Structures and Its Effect on Reactivity," with G.R. Gavalas in preparation.

"Natural Frequencies and Mode Shapes of Straight Tubes," Proprietary Report for Heat Transfer Research Institute, Alhambra, CA (1990).

"Optimal Tube Layouts for Kamui SL-Series Exchangers," with K. Ishihara, Proprietary Report for Kamui Company Limited, Tokyo, Japan (1990).

"HTRI Process Heater Conceptual Design," Proprietary Report for Heat Transfer Research Institute, Alhambra, CA (1990).

"Asymptotic Theory of Transonic Wind Tunnel Wall Interference," with N.D. Malmuth and others, Arnold Engineering Development Center, Air Force Systems Command, USAF (1990).

"Gas Radiation in a Fired Heater Convection Section," Proprietary Report for Heat Transfer Research Institute, College Station, TX (1990).

"Heat Transfer and Pressure Drop in NTIW Heat Exchangers," Proprietary

Report for Heat Transfer Research Institute, College Station, TX (1991).

"NOx Control and Thermal Design," Thermal Engineering Tech Briefs, (1994).

"From Puchase of Landmark Environmental Insurance to Remediation: Case Study in Henderson, Nevada," with Robin E. Bain and Jill Quillin, presented at the AQMA Annual Meeting, Florida, 2001.

"The Jones Act Contribution to Global Warming, Acid Rain and Toxic Air Contaminants," with Charles W. Botsford, presented at the AQMA Annual Meeting, Florida, 2001.

PRESENTATIONS (PARTIAL LIST)

"Pore Structure and Combustion Kinetics - Interpretation of Single Particle Temperature-Time Histories," with P.S. Northrop, R.C. Flagan and G.R. Gavalas, presented at the AIChE Annual Meeting, New York (1987).

"Measurement of Temperature-Time Histories of Burning Single Coal Char Particles," with R.C. Flagan, presented at the American Flame Research Committee Fall International Symposium, Pittsburgh, (1988).

"Physical Characterization of a Cenospheric Coal Char Burned at High Temperatures," with R.C. Flagan and G.R. Gavalas, presented at the Fall Meeting of the Western States Section of the Combustion Institute, Laguna Beach, California (1988).

"Control of Nitrogen Oxide Emissions in Gas Fired Heaters - The Retrofit Experience," with G. P. Croce and R. Patel, presented at the International Conference on Environmental Control of Combustion Processes (Jointly sponsored by the American Flame Research Committee and the Japan Flame Research Committee), Honolulu, Hawaii (1991).

"Air Toxics - Past, Present and the Future," presented at the Joint AIChE/AAEE Breakfast Meeting at the AIChE 1991 Annual Meeting, Los Angeles, California, November 17-22 (1991).

"Air Toxics Emissions and Risk Impacts from Automobiles Using Reformulated Gasolines," presented at the Third Annual Current Issues in Air Toxics Conference, Sacramento, California, November 9-10 (1992).

"Air Toxics from Mobile Sources," presented at the Environmental Health Sciences (ESE) Seminar Series, UCLA, Los Angeles, California, November 12, (1992).

"Kilns, Ovens, and Dryers - Present and Future," presented at the Gas Company Air Quality Permit Assistance Seminar, Industry Hills Sheraton, California, November 20, (1992).

"The Design and Implementation of Vehicle Scrapping Programs," presented at the 86th Annual Meeting of the Air and Waste Management Association, Denver, Colorado, June 12, 1993.

"Air Quality Planning and Control in Beijing, China," presented at the 87th Annual Meeting of the Air and Waste Management Association, Cincinnati, Ohio, June 19-24, 1994.