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STATE OF ILLINOIS
Pollution Control Board

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PUBLIC COMMENTS OF SIERRA CLUB
R-0625 (Rulemaking-Air)

I. Introduction

Sierra Club strongly supports the proposed mercury rule now before the Illinois Pollution Control Board (hereinafter "IPCB"). The record now before the IPCB clearly demonstrates the public health and environmental benefits to Illinois that will be achieved by deeper, faster reductions of mercury emissions from Illinois coal-fired power plants than under the federal CAMR alone. This record includes the comprehensive case presented by IEPA with the testimony of a dozen expert witnesses and thousands of pages of other supporting exhibits and documents, the case presented by other proponents through their expert witness and comments, and in excess of 6000 public comments. The record is clear that these additional reductions can be achieved using available technology and without creating disproportionate costs to electric generating units ("EGUs") or consumers, especially in light of the regulatory flexibility mechanisms of the rule. The feasibility of achieving these reductions is underscored by the willingness of Ameren and Dynegy, the second and third largest operators of coal-fired EGUs in Illinois, to support the proposed rule.

Illinois EPA's rulemaking proposal is consistent with CAMR, which provides an option for states to develop their own regulatory approaches to control mercury from coal-fired power plants. 70 *Fed. Reg.* 28632; see also, 42 U.S.C. § 7416. At the same time, Illinois EPA's rulemaking proposal is more advanced and targeted than CAMR in protecting the health, safety and welfare of Illinois residents, preserving and enhancing Illinois' natural environment for

future generations, and mandating deeper mercury reductions that are nonetheless achievable for regulated entities operating in this state.

The critical issue in this case is not whether Illinois EPA is justified in regulating mercury emissions from coal-fired power plants. After all, even CAMR, which the opponents prefer, does this. Rather, the remaining issue is whether the Illinois EPA proposal will produce public health and environmental benefits through deeper, faster reductions than those mandated under CAMR in a manner that is reasonable for regulated entities to achieve. In these comments, the Sierra Club focuses on evidence in the record about Illinois-specific factors which provide ample justification for going beyond CAMR using the Illinois EPA proposal.

II. Mercury Threatens Illinois Ecosystems, Illinois Residents and Illinois Wildlife.

Long before CAMR and this rulemaking, Illinois specifically identified mercury as a major threat to the health of Illinois residents and the quality of Illinois ecosystems. The Illinois Department of Public Health has established mercury advisories for all water bodies in Illinois due to the levels of methylmercury in predator fish. (Pre-filed testimony of James Ross, at 5, see also TR. 6/12 at 57; TR. 6/14 at 97). In addition, there are 61 river segments (1,034 miles) and 8 lakes (6,264 acres) that are listed as impaired waters due to mercury levels, triggering Illinois' obligations to impose Total Maximum Daily Load requirements that originate in the Clean Water Act. (Pre-filed testimony of James Ross, at 5 – 6). Up to three-quarters of tested water bodies have fish with mercury levels that justify a fish consumption advisory. (TR. 6/12 at 67). This determination is made using U.S. Food & Drug Administration Action Levels adapted into the "Protocol for a Uniform Great Lakes Sport Fish Consumption Advisory" by Illinois and seven other Great Lake states. (Pre-Filed testimony of Thomas C. Hornshaw, Ph.D., at 2). In fish tissue sampling conducted between 1988 and 2001, two-thirds to three-quarters of all bass and

walleye from Illinois waters have mercury levels that would justify a consumption advisory. (TR. 6/13 at 71).

A fish consumption advisory cautions against eating more than one fish meal per week. (TR. 6/13 at 31). However, because this is only an advisory, there is no legal mechanism actually preventing people from eating any amount of mercury-containing fish from Illinois waters. Indeed, the Illinois Department of Natural Resources issues approximately 700,000 fishing licenses annually. (TR. 6/12 at 61). One sub-population that is especially susceptible to mercury, children, can fish without obtaining a license. (TR. 6/16 at 63). In his testimony, Dr. Thomas Hornshaw identifies several studies of the fish consumption patterns of anglers, including a study of Illinois anglers conducted between 1987 to 1993, which demonstrate anglers will consume unhealthy quantities of fish even though advisories exist. (Pre-Filed testimony of Thomas C. Hornshaw, Ph.D., 4-5). Dr. Hornshaw concludes, "This review of fish consumption literature provides convincing evidence that sport anglers may consume amounts of sport-caught fish that could allow them and their families to exceed health-based limits for chemical contaminants in their catch." *Id.* at 5.

Even if no consumer ate mercury-contaminated fish caught in an Illinois waterway, there would still be a basis for regulating mercury emissions from coal-fired power plants. In his testimony, Dr. Michael Murray identified emerging research on the destructive impacts of mercury on a variety of animal species. Of course, unlike human receptors, animals cannot attempt to avoid intake of mercury-containing food sources. Dr. Murray identified a Noah's Ark of species for which research suggested a risk from mercury exposure, including mallard ducks, loons, belted kingfishers, blue herons, ring-necked pheasants, thrush, insectivorous passerines, 13 species of freshwater fish, many insect consuming mammals, mink, otters and aquatic insects.

(TR. 8/14 at 71-75). Notably, this is the list for which research exists; it is not the list of all potentially harmed animal receptors.

Because of well-documented conditions in Illinois waterbodies and fish, and the associated risks to Illinois anglers, fish consumers and wildlife, there is a strong justification to develop an Illinois-specific regulatory approach to control mercury.

III. Mercury Deposition in Illinois Will Be Substantially Reduced Under the Proposed Illinois Rule at a Rate Much Faster and Greater Than What Would Be Achieved Under CAMR Alone.

Before considering the contribution of Illinois coal-fired power plants to mercury loading in Illinois, it is important to emphasize that the IPCB is authorized to, and frequently will, issue regulations that:

- control only one source category among several that are sources of a pollutant;
- control emissions into only one medium like air;
- control emissions because of a potential threat to human health or the environment, without any showing of actual damage that has already occurred;
- control emissions from a source category even if this may not lead to a direct or one-to-one reduction in the exposure rate of any receptor or group of receptors;
- control emissions from a source category even if its relative contribution to cumulative emissions of a pollutant is comparatively small; and/or
- implement requirements that originate under one statute, even if other statutes could also address other aspects of controlling a pollutant.

When measured next to the facts in the record, the Illinois EPA's mercury pollution reduction proposal greatly exceeds the threshold for regulatory activity.

Illinois' coal-fired power plants are the largest unregulated anthropogenic source of mercury emissions in the state. According to the National Emissions Inventory, as much of 71% of Illinois mercury emissions are from Illinois coal-fired power plants, significantly in excess of the U.S. average of 44% (TR. 6/12 at 47, Technical Support Document, at 33-34). Illinois' next largest source of mercury emissions is the commercial/industrial boiler category, which accounts for 11% of the total. *Id.* at 33. By comparison to the national average and other contributing sources within the state, Illinois coal-fired EGUs are a hugely disproportionate contributor of mercury air emissions. This fact alone, largely uncontested in this rulemaking, provides a powerful justification for the development of an Illinois-specific rule mandating deeper, faster reductions from this source category than required under CAMR.

Concomitantly, reducing mercury emissions from Illinois coal-fired power plants in a manner consistent with the proposed Illinois rule will substantially reduce mercury deposition in Illinois. According to the opponents' own expert on mercury deposition, Krish Vijayaraghavan, the Illinois rule will result in lower mercury deposition in Illinois than under the federal approach alone. This additional reduction will occur throughout Illinois, will occur very soon after the Illinois rule becomes effective, and can be quantified. More specifically, Mr. Vijayaraghavan testified:

- from 2006 to 2010, if the 2010 CAIR/CAMR rule alone, is implemented there will be a 5.3 percent decrease in mercury deposition in Illinois (TR. 8/21 p.m. at 1422);
- from 2006 to 2010, if the proposed Illinois rule is implemented, there will be a 9.5 percent decrease in mercury deposition, which is an additional 4.2 percent decrease in deposition as compared to 2010 CAIR/CAMR (TR. 8/21 p.m. at 1422, 1433);

- the deeper reductions under the Illinois rule will occur throughout the entire state of Illinois (TR. 8/21 p.m. at 1462);
- under the CAIR/CAMR rule alone, Illinois will have to wait 10 additional years to experience reductions roughly equivalent to the reductions achieved under the proposed Illinois rule in 2010 (TR. 8/21 p.m. at 1432); and
- the TEAM model predicts that, in the single year of 2010 alone, there will be 321 fewer pounds of mercury deposited in Illinois under the proposed Illinois rule than under 2010 CAIR/CAMR alone (TR. 8/21 p.m. at 1497).

Mr. Vijayaraghavan's estimate that, in the year 2010, there will be 321 fewer pounds of mercury deposition under the Illinois rule than under CAMR/CAIR alone is significant confirmation that Illinois-specific benefits will be achieved. Although CAIR/CAMR eventually produces roughly equivalent reductions by 2020, there would be ten years during which the Illinois rule would generate greater reductions than CAIR/CAMR alone. The cumulative effect over a period of ten years would be thousands fewer pounds of mercury deposited in the environment under the Illinois rule. This is especially significant because mercury is persistent, bioaccumulative and toxic in the environment.

Illinois EPA developed a comparison between the available mercury allowances under CAIR/CAMR until 2018 and the anticipated mercury emissions under the Illinois rule starting in 2009. This comparison is necessary to demonstrate to U.S. EPA that the proposed Illinois rule will meet the CAMR reduction target for Illinois. Illinois estimates that under CAMR, Illinois would have a 3,000-pound-per-year emissions cap that could be used or traded by Illinois coal-fired EGUs. Under the proposed Illinois rule, mercury emissions are expected to be roughly 1,000 lbs. per year. (TR. 6/19 at 46).

Just as importantly, reducing mercury from Illinois coal-fired EGUs is likely to have a local impact in reducing mercury deposition. Dr. Gerald Keeler testified that mercury deposition attributable to coal-fired EGUs can occur in close proximity to the plants themselves. These close-in mercury deposition levels are particularly elevated during periods of intense precipitation, but routinely occur as dry deposition as well. Dr. Keeler's testimony was based upon the report analyzing of mercury wet deposition in Steubenville, Ohio, of which he was one author.

Since the conclusion of the public hearings, the Illinois EPA filed Dr. Keeler's peer-reviewed paper, "Sources of Wet Deposition in Eastern Ohio, USA", by Keeler, Landis, Norris, Christianson and Dvonch, as published in Environmental Science & Technology on the web on 09/08/2006. In keeping with Dr. Keeler's testimony before the IPCB, this paper concludes that a multi-year, multi-faceted analysis of mercury wet deposition in Steubenville "...consistently point[s] toward the dominant influence by local and regional coal burning sources." *Id.* at G. The Steubenville study employs a receptor-based model that measures actual mercury concentrations in precipitation, and then attributes these concentrations to source categories using two different techniques (PMF and Unmix) that do not rely on source profiles or emission inventories, but instead rely on sample concentrations of analytes that are closely associated with emissions from different categories of sources. *Id.* at B. Both the PMF and Unmix statistical analyses determined that approximately 70% (69% and 73%, respectively) of mercury wet deposition in Steubenville was attributable to the coal combustion source category. *Id.* at D and F. By correlating mercury concentrations in precipitation with local meteorological conditions, for example stagnant conditions that minimized any influence by distant sources, the authors were able to conclude the data indicate "...a strong local and regional source influence." *Id.* at

G. Mr. Vijayaraghavan testified that the results of the Steubenville study were consistent with the results of his own modeling exercise for Steubenville. (TR. 8/21 p.m. at 1404).

Using very different methods, both the proponents through Dr. Keeler and the opponents through Mr. Vijayaraghavan respectively, have provided important evidence that reducing mercury emissions from Illinois coal plants is likely to result in a reduction in mercury deposition in Illinois itself.

IV. The Proposed Rule is Technically Achievable, Economically Feasible, and Reasonable.

As an initial matter, it is extremely difficult for the remaining opponents to this rule to argue that the rule is not technically or economically feasible when Ameren and Dynegy, the second and third largest operators of Illinois coal-fired power plants, now support the rule and are committed to complying with its terms. Moreover, during the pendency of these proceedings, on August 10, 2006, the operator of a single facility, Springfield City, Water, Light and Power, agreed to a negotiated PSD permit which included a requirement to comply with the output-based or percentage reduction numeric standard in the proposed rule. (Construction Permit, PSD Approval, NSPS Emission Units, issued to City of Springfield by the Illinois EPA, at 4-12 (August 10, 2006), available online at http://yosemite.epa.gov/r5/il_permit.ns.) It is also notable that despite the opportunity to do so, the remaining opponents have presented no facility-specific or companywide information about the projected costs of compliance. This was made very clear during the testimony of Midwest Generation's witness, William DePriest, when he testified that he had prepared cost estimates, but was not at liberty to share this analysis (this information is "kind of off bounds", TR. 08/17 p.m. at 1058; witness unwilling to provide information about specific companies, *Id.* at 1069; witness refuses to provide cost estimate information that exists in work done for utilities in the state of Illinois, *Id.* at 1065).

Perhaps just as importantly, there are at least nine features in the Illinois EPA proposal which provide substantial flexibility to regulated entities. These mechanisms are:

1. allowing a regulated entity to choose to comply using an output-based standard, .008 lbs/gwh, or a percentage reduction, 90%;
2. allowing a regulated entity to elect to comply using any combination of techniques and technologies to meet an output-based or reduction standard, ranging from coal selection and preparation techniques, to mercury-specific pollution control devices and sorbents, to pollution control equipment that will reduce an array of pollutants including mercury, to achieving compliance under multiple regulatory initiatives (proposed Section 225.233);
3. providing regulated entities with almost three years before compliance is required;
4. allowing compliance to be determined on a 12-month rolling average;
5. allowing owners of multiple EGUs to choose to comply by averaging among units during the first phase or the regulatory program (through 2013), and allowing owners of single EGUs to average with other similarly situated operators;
6. allowing a complete opt-out for units the regulated entity decides to shutdown;
7. allowing a regulated entity to choose to use the Temporary Technology Based Standard ("TTBS") to set aside 25% of its units from meeting a numeric standard until 2015, upon a showing that these units are optimizing ACI mercury control equipment and meeting other operational requirements;
8. allowing a regulated to choose an integrated pollution control strategy which will control mercury and other pollutants through the Multi-Pollutant Standard ("MPS"), thus

complying with the proposed Illinois rule and other near-term regulatory requirements; and,

9. providing for the same alternative mercury monitoring requirements contained in the federal CAMR, including the use sorbent trap monitoring devices as well as newer CEM systems.

Notably, very few of the opponents' experts included any evaluation of these flexibility mechanisms as part of their testimony. For example, James Marcetti's testimony on economic modeling did not account for either the TTBS or the MPS (TR. 8/18 p.m. at 1308-1309).

The Illinois proposal also provides practical flexibility to regulated entities to decide how to achieve mercury reductions. Appropriately, the IPCB now has a very complete record on activated carbon injection systems. These units can be relatively inexpensive ($1-3 million in initial installation costs), can be installed quickly (six months from order to installation, TR. 6/22 a.m. at 137), can be installed while the plant operates (*Id.*), are easily integrated with existing pollution control equipment (often requiring only a port in the ductwork between the boiler and existing pollution control equipment, TR. 6/23 p.m. at 470-71) and have relatively low operating costs (advanced halogenated sorbents cost 90 cents/lb, TR. 6/22 a.m. at 85).

Activated carbon injection units are designed to achieve in excess of 90% mercury removal once optimized consistent with operations at specific facilities. (Pre-filed Testimony of James Staudt, Ph.D. at 6-7). There is a great deal of testimony before the Board regarding the actual removal efficiency of ACI systems. However, the technical feasibility of this rule is not dependent on use of ACI alone to meet the standards imposed by the rule. The record contains several other examples of practical, existing technologies and techniques to reduce mercury that can be used alone or in combination with ACI systems. Ultimately, the proposed rule allows the

operator to decide how to combine options to meet mercury removal requirements (TR. 6/22 a.m. at 196). These technologies and techniques include:

- Using a very low mercury coal that, coupled with a .008 lbs./gwh emission standard, can achieve 50-80% of the required reduction. (TR. 6/23 at 452-452). Another, related possibility is to blend with lower mercury coals. *Id.* It is already common for facilities to use coal selection, preparation (washing, for example) and blending techniques; these techniques could be applied in order to minimize emissions of a new pollutant, mercury. (Pre-filed Testimony of James Staudt, Ph.D. at 3).
- Employing/enhancing existing pollution control technologies. For facilities using or planning to install scrubbers, it is likely no additional mercury-specific controls will be required (TR. 6/21 a.m. at 134). Fabric filters, ESPs, FGD systems, and SCR systems can remove or enable the removal of mercury as a co-benefit of controlling other regulated pollutants (Pre-filed testimony of James Staudt, Ph.D. at 3-4). ACI systems would work in combination with these existing systems to provide additional mercury removal efficiency.
- Monitoring existing facility performance. At every facility, there is already unmeasured mercury removal using existing pollution control equipment. The actual rate of removal or emission rate has not been determined because there has been no regulatory requirement to do so.

Because of this flexibility and the relatively low cost of installing and operating ACI systems, it is not surprising that Dr. Ezra Hauzman characterized the cost to owners of Illinois coal plants as almost negligible. According Dr. Hauzman, the total additional annual control costs associated with the Illinois rule are $33 million. (Dr. Ezra D. Hausman, Pre-Filed

Testimony, at 8). In order to provide a context, Dr. Hausman points out that the total cost to fuel electric power plants in Illinois is almost 2 billion dollars per year. *Id.* at 12. Also by point of comparison, the average cost increase for Illinois coal plants under the Illinois EPA proposal is $0.375/MWh, a trivial amount when compared to the current retail price of electricity in Illinois, roughly $65.00/MWh. There is reason to believe the impact on consumers would be close to zero. Because Illinois utilities do not own the coal plants and the EGU's are competing in an auction process with other generators, there is no existing means by which Illinois consumers could be directly charged even the *de minimus* additional costs that would result from adopting this rule. Consequently, Dr. Hausman estimates the total additional cost to consumers to be between $0 and $11 million. *Id.* at 8.

V. The Proposed Rule Will Not Impact the Integrity of the CAIR Proceedings

Ameren and Dynegy proposals contain a Multi-Pollutant Standard, involving reductions of pollutants, NOx and SO2, that would not be otherwise regulated under the mercury rule at issue in this proceeding. These reductions are obviously being proposed with an eye toward future possible regulations of such pollutants, including proposed regulations being considered in the upcoming CAIR rulemaking before the Board. We would support the mercury rule before the board with the MPS included as agreed to by Ameren, Dynegy, and Illinois EPA, because we believe the mercury reductions achieved by entities choosing the MPS avenue of compliance will meet the goals of the original mercury proposal.

The Hearing Officer requested guidance on how the MPS and the inclusion of it in a final mercury rule would affect the CAIR rulemaking. First, the MPS is one avenue of compliance in the proposed mercury rule. Therefore, selection of the MPS avenue of compliance is voluntary, as regulated entities may select any one of the proposed avenues of compliance in the mercury

rule. Therefore, the mercury rule contains no mandatory NOx or SO2 reductions that must be made by any entities not selecting the MPS avenue of compliance.

Second, while the MPS anticipates that NOx and SO2 reductions would be consistent with or in excess of the requirements that will be imposed under CAIR, the MPS does not dictate that companies undertaking the MPS be viewed as in compliance with CAIR. Once the CAIR limits are set, it is certainly possible that utilization of the MPS will result in compliance with CAIR, but that is not mandated in the MPS.

Third, while the goal of the MPS is to begin to address CAIR requirements in addition to mercury reductions, that does not predetermine the outcome of the CAIR proceedings. The MPS can certainly be informative as to what those reductions might be. In the joint statement, the parties "anticipate[d] that the installation and operation of pollution control equipment required to achieve the NOx and SO2 standards under the revised Proposed New Section 225.233 will achieve more reductions in NOx and SO2 emissions than are required under the Clean Air Interstate Rule or 'CAIR'." But, once again, that is only anticipated and the outcome is not mandated in the MPS or in any way binding on the CAIR rulemaking. Through the CAIR rulemaking, the Board is at free to make a determination as to what reductions will be required of regulated entities. The MPS places no restrictions on the Board as to what the reductions must be.

Regulated entities that elect to utilize the MPS would need to comply with both the requirements of the MPS and the proposed CAIR. Such entities would be required to comply with both the CAIR cap and trade requirements and the numeric emission limits of the MPS. Regulated entities will need to both hold sufficient allowances each year under CAIR and emit NOx and SO_2 at a rate equal to or less than the numeric emission limits of the MPS. Obtaining

additional CAIR allowances would be required when necessary to comply with CAIR even if actual emissions rates meet the requirements of the MPS. Finally, in order for the MPS to protect air quality in fact, it does not allow the trading of allowances that are generated as a result of measures taken to comply with the NOx and SO_2 emission standards.

In sum, the MPS can inform the CAIR rulemaking and would appropriately be considered in the CAIR rulemaking but does not predetermine any outcome of the CAIR rulemaking. Additionally, the MPS proposal is designed to work within the CAIR requirements and regulated entities will need to comply with both, especially since different limits will be set under both.

VI. Conclusion

In sum, the Sierra Club strongly supports the proposed rule now before the Illinois Pollution Control Board. The record before the IPCB amply supports the rule and demonstrates the public health and environmental benefits to Illinois of the deeper, faster reductions of mercury emissions resulting from the proposed rule compared to those under the federal CAMR alone. The record is clear, especially in light of Ameren's and Dynegy's support of the proposed rule, that these reductions can be achieved with available technology, at reasonable cost, and through utilization of the regulatory flexibility mechanisms built into the rule.

On Behalf of the Sierra Club, Illinois Chapter:

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