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From: Veda Emmett [mailto:veda@ucar.edu]  
Sent: Tuesday, April 05, 2005 3:23 PM  
To: Washington Commission  
Cc: Commission; killeen; veda  
Subject: Comments on Air Quality Report

Secretary, United States Section  
International Joint Commission  
1250 23rd Street, N.W., Suite 100  
Washington, DC 20440

Attention: Hon. Dennis L. Schornack, Chair; United States Section

Thank you so much for the opportunity for the National Center for Atmospheric Research to provide comments on the 2004 Progress Report of the Air Quality Committee.

We apologize for the lateness of the comments (or for the duplication if the report was already sent). The person who was handling this had an unexpected medical emergency about the time of the due date for the comments, and this document was just recently discovered.

Although late, we hope that the input will still be useful.

Best regards,  
Veda Emmett

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## Comments on the United States-Canada Air Quality Agreement: Progress Report 2004

Thank you for providing us with the opportunity to comment on this report. We congratulate the parties on the progress that has thus far been accomplished and support their redoubled efforts in understanding, ameliorating and mitigating the environmental effects of reduced air quality. We encourage the participants to increase the reliance on research grade regional transport models in understanding the processes at work in the trans-boundary region, the impact of long-range transport on local events and the potential outcomes on various control strategies. To follow are some specific comments concerning the acid rain and ozone annexes.

### *Acid Rain Annex*


We note with pleasure the decreases in acid rain precursors over the period of the report. However, we must express concern over the use of "banked" emissions to offset annual targets, as this could lead to an over-estimation of ecosystem impacts in one growing season, i.e., in those years where emissions are notionally banked. Additionally, and, more importantly, this can lead to an underestimate of ecosystem impacts on acid rain in those years when banked emissions are used to relieve emission restrictions when the target levels would otherwise exceed the cap. It was not possible from the report to assess the magnitude of banked emissions. Therefore, the overall impact on the ecosystem is uncertain.

The report places much greater emphasis on the emission from fixed sources of nitrogen and sulfur oxides with less emphasis on mobile sources, while the totality of the problem requires consideration of the combined outputs.

Nevertheless, a positive aspect of the report is the reduced emissions of SO<sub>2</sub> and NO<sub>x</sub> leading to an overall decrease in acid rain. These trends need to be sustained. However one should also note that emission targets were not met until 2003/2004.

With respect to emission monitoring, there is a need to report Canadian and U.S. data in self-consistent fashion to facilitate ease of comparison and to standardize through inter-comparisons.

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Although, as we noted earlier, deposition is reduced, likely due to the reduction in power station emissions, it is not clear if the deposition maps reported on page 7 have decreased in proportion to the reductions in emission.

### *Ozone Annex*

As noted above the reported decrease in emission of SO<sub>2</sub> and NO<sub>x</sub> have resulted in reduced acid deposition. This, combined with the reported reductions in VOC emissions should, in a simplistic sense, have led to a reduction in ground level ozone, which is in contradiction to the findings that ground level ozone has increased over the period reported. This apparent paradox can be resolved by considering several factors: 1) Transport of ozone or precursors from outside the study areas, 2) Inaccuracies in the emission inventories, 3) The role of scattering aerosol in increasing the optical path length and therefore the photochemical impact of precursors, and 4) The role of turbulent mixing from aloft in controlling the observed peak ozone concentrations.

For example, the TexasAQS 2000 study found extremely high alkene concentrations in the Houston ship canal area over and above that expected from emission inventories. Similarly, biogenic emissions of organic aerosol precursors are uncertain and require further refinement.

The discussion of the cap and trade programs for emissions raises a number of questions but does not answer them. These include, 1) Will the proposed emission-trading actually lead to a decrease in ozone production?, 2) Will the cap and trade policies lead to a net reduction of ground level ozone concentrations or will the pollution simply be exported to states not included in the program?

The report noted the importance of weather on ground level ozone and PM<sub>10</sub> concentrations. This importance can not be overstated. Thus, state of the science regional models of atmospheric composition that incorporate the short term variations due to weather are an essential tool for assessing the likely changes in pollutant concentrations resulting from changes in emissions.